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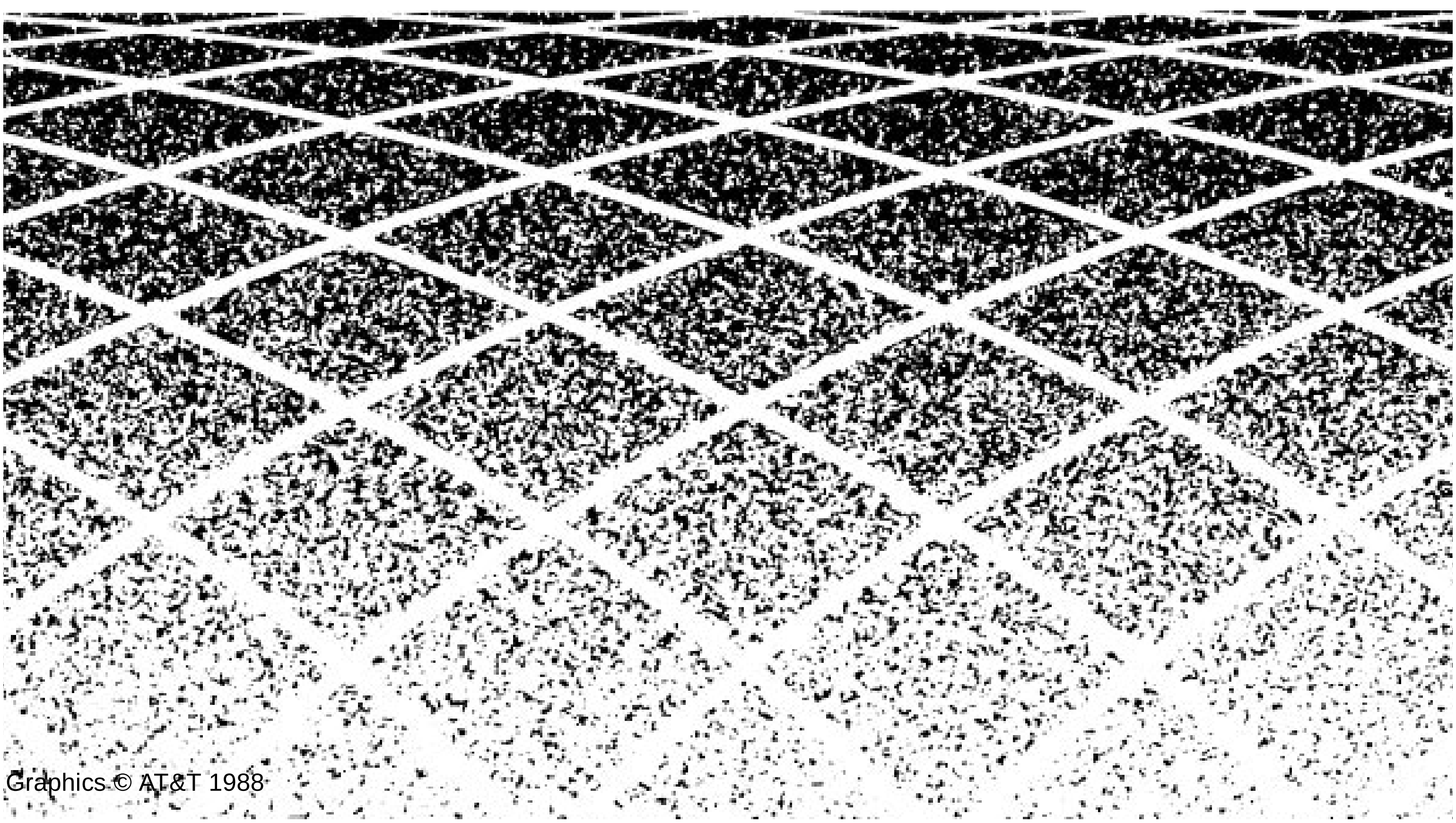
DEFINITY Enterprise Communications Server Release 5 Maintenance for R5vs/si



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About This Document

General

This manual provides the information needed to monitor, test, and maintain DEFINITY® Enterprise Communications Server Release 5, DEFINITY® Communications System Generic 3i/s/vs Version 4, Generic 3i Version 1.1-286, and Generic 1, and it covers many of the faults and troubles that can occur in the system. Most maintenance requirements are simple procedures due to the modular, self-testing nature of the system.

Simple, traditional trouble shooting methods still have a valid place in maintaining a system as advanced as this one, and those methods are sometimes sufficient to locate and clear faults. The traditional methods include terminal substitution, visual inspections, continuity checks, and clarification of operating procedures with users.

The information in this manual is intended for use by:

1. A maintenance technician dispatched to a DEFINITY System site in response to a trouble alarm or a user trouble report,
2. A maintenance technician located at a remote maintenance facility, or
3. The user's assigned maintenance technician. The technician is expected to have a knowledge of telecommunications fundamentals and of the DEFINITY® Enterprise Communications Server Release 5, DEFINITY® Communications System Generic 3i/s/vs Version 4, Generic 3i Version 1.1-286, and Generic 1, Systems to the extent that the procedures in this manual can be performed, in most cases, without assistance.

Each installed DEFINITY system has a user-designated System Manager who is responsible for administration of the system. This person's duties and capabilities with respect to the system are covered in the following manuals:

- *DEFINITY Communications System Generic 1 and Generic 3 System Management*, 555-230-500.
- *DEFINITY Communications System Generic 3 V2 Traffic Reports*, 555-230-511.
- *DEFINITY Communications System Generic 3 Implementation*, 555-230-653.

The maintenance technician should work closely with the user's System Manager.

This manual is not intended to solve all levels of trouble. It is limited to troubles that can be solved by using the Alarm Log, Error Log, trouble-clearing procedures, maintenance tests, and traditional troubleshooting methods. When the limits of trouble-clearing analysis are reached and the trouble still has not been resolved, it is your responsibility, as the maintenance technician, to escalate the problem to a higher level of technical support. Escalation should conform to the procedures in the *Technical and Administration Escalation Plan*.

The activity of a maintenance technician called to a DEFINITY System site to clear alarmed troubles will probably consist of replacing at least one piece of equipment. Multialarmed and user-reported troubles may require more investigation and analysis.

Using the maintenance procedures provided in this manual, the maintenance technician can do the following:

- Observe alarm conditions
- Perform emergency restoration procedures
- Replace system components
- Perform maintenance tests
- Analyze displays of alarms, errors, and test results

This issue replaces all previous issues of this manual. When features, screen displays, equipment, or operations differ between, for example, Generic 1 and Generic 3i, these differences are clearly identified by use of the following indicators: "[G3iV2-386]" for Generic 3i Version 2-386 System, "[G3sV2]" for Generic 3s Version 2, "[G3vsV2]" for Generic 3vs Version 2, "[G3iv1.1-286]" for Generic 3i Version 1.1-286 System, and "[G1]" for Generic 1.

International features and screen displays are identified by "[G31.2SE]" for International Generic 1.2 System Enhanced, by "[G3iV2-386]" for International Generic 3i System (also known as a Medium system), and by "[G1SE]" for International Generic 1 System Enhanced. A few MO sections are devoted to a specific Generic, and in those cases, the Generic number is listed in the MO title and headings. The rest of the International information is incorporated in existing MOs, but is clearly marked as such.

Conventions Used in This Document

The following conventions are used in this document:

- DEFINITY Systems are called G3V4, G3 Release 5; G3vs; G3si, and G3r
- All occurrences of G3siV4, G3siV4+m, G3siV5, and G3siV5+m are called G3si unless a specific configuration is required to differentiate between product offerings
- All occurrences of G3 with out a suffix following the “3” refer to G3vs, G3si, and G3r
- A component of a DEFINITY System, such as a circuit pack, occurring without a reference to any specific system, is part of G3

NOTE:
In this manual, the term “ASAI” is synonymous with the newer CallVisor ASAI.

Organization

This manual is organized into three volumes. Each volume contains the table of contents and index for the entire manual. Volume 1 contains the “About This Book” introduction that you are now reading and Chapters 1 through 10. Volume 2 contains the first part of Chapter 11, and Volume 3 contains the final portion of Chapter 11, Chapter 12, and Appendix A, “References.”

One goal of this introduction is to tell you the kind of information you can find in the manuals, where to find it, and how best to use the manual. The remaining chapters of this manual contain the following information:

- **Chapter 1, "Maintenance Architecture"** describes the system’s design and maintenance strategy.
- **Chapter 2, "Hardware Configurations and Power"** describes the system’s cabinets, carriers, and circuit packs. The chapter also explains how power is supplied to the system.
- **Chapter 3, "Management Terminals"** describes the terminals that can be used in the system. The chapter also discusses how to set up and use these terminals.
- **Chapter 4, "Initialization and Recovery"** describes the various reset and reboot processes, and it discusses how these processes are used to perform maintenance and to recover systems or subsystems that are out of service.

- **Chapter 5, "Routine Maintenance Procedures"** discusses common maintenance tasks, including: removing and installing circuit packs, removing and restoring power, performing system backups, upgrading software, as well as various testing and troubleshooting procedures.
- **Chapter 6, "Accessing Alarms and Errors"** provides general information about the maintenance subsystem and the separate entities—known as MOs—comprising it. Error generation and tracking, the Error and Alarm Logs, and associated reports are also described.
- **Chapter 7, "LED Interpretation"** is a quick reference to interpreting circuit pack LEDs.
- **Chapter 8, "Reliability Systems: A Maintenance Aid"** provides detailed hardware and functional descriptions as well as additional repair strategy (in addition to the procedures provided in Chapter 11) for Standard, High, and Critical Reliability systems.
- **Chapter 9, "Packet Bus Fault Isolation and Correction"** describes Pack Bus maintenance and the interactions of the bus with Packet circuit packs. The chapter also discusses how Packet Bus faults are isolated and corrected.
- **Chapter 10, "Maintenance Commands and Trouble-Clearing Aids"** presents the maintenance commands, and it explains how to use these commands via the management terminal. Maintenance commands are used to control, test, and obtain information associated with maintenance objects (MOs). Specific command syntax plus typical forms and display output are also provided in the chapter.
- **Chapter 11, "Maintenance Object Repair Procedures"** contains specific troubleshooting and repair instructions for every component in the system.The chapter contains repair procedures for both system-alarmed and user-reported troubles. Information on each MO is contained in a section solely devoted to that MO. For each MO, a table lists the alarm level(s), hardware error(s) associated with the MO, and the associated test that caused the error(s). The test sequences and the specific command line entry required to run the tests are provided, as is a brief description of each test. Explanations of error codes associated with each test are given, as are specific maintenance procedures to be used to resolve each problem.
- **Appendix A, "References"** is an abbreviated listing and brief description of Generic 1 and Generic 3 documents.
- **Abbreviations** provides a list of abbreviations and acronyms used in this manual.
- **Index** contains an alphabetical, subject-to-page number cross-reference.

As you will see, many routine maintenance tasks, such as removing and installing circuit packs, can be performed after reading the general repair information on this subject. There will be times, however, when you will want more equipment-specific information (for example, how to clear a major alarm raised against a particular MO). To help you, each MO is described in a separate section of Chapter 11, "Maintenance Object Repair Procedures". The individual sections are labeled with the name of the particular MO exactly as the name appears in the Alarm Log; for example, MAINT (for Maintenance circuit pack). The only exception is the MO name for Common Port Circuit Pack maintenance which is XXX-BD. The XXX-BD section contains a set of common tests used by certain circuit packs listed in the section. The common portion of these circuit packs is the generic hardware that interfaces with the TDM Bus. At times, you may need to reference information in more than one chapter at a time to repair the system. For example, if multiple alarms are present, you can determine which alarm should be repaired first by consulting Table 6-1 in Chapter 6, "Accessing Alarms and Errors", which shows all MOs, errors, and alarms in descending order of urgency. Then, consult the required MO section(s) in the suggested order. References to other chapters and sections are provided in this manual wherever deemed helpful. It is hoped that effective use of this manual will reduce repair and “down” time.

Lucent Technologies listens carefully to its readers. The organization of this manual is a direct result of user feedback. Your feedback is important. Use the feedback form at the back of this manual to send your comments to Lucent Technologies. After you have used this manual, please tell us what you think of it. We want to know!

Assumption

The maintenance procedures in this manual are based on the assumption that the system was initially installed and tested properly and all faults cleared.

Safety Precautions

When performing maintenance or translations procedures on the system switch equipment, certain precautions must be observed by user personnel. Observe all caution, warning, and danger statements contained within this manual to prevent loss of service, possible equipment damage, and the possibility of personal injury.

In addition, the following precautions regarding electromagnetic interference (EMI) and static electricity must be observed:

Electromagnetic Interference (EMI): This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise to be introduced into the customer’s equipment. If the equipment is not installed and used in accordance with the instruction manual, radio interference may result.

WARNING:

To maintain the EMI integrity of the system switch, maintenance personnel (after performing any translations or maintenance activities) must ensure that all cabinet panels, covers, etc. are firmly secured before leaving the customer's premises.

Static Electricity: To prevent or reduce electrostatic discharge (ESD), maintenance personnel must always attach wrist grounding straps before working on switch components or handling circuit packs.

CAUTION:

Electrostatic discharge can damage or destroy circuit packs containing integrated circuits (ICs).

The ESD write strap, cable assembly, and spare fuses are packed in a plastic bag and placed in the top of the system cabinet.

The ESD wrist strap is to be used whenever troubleshooting, performing maintenance, or handling any circuit packs associated with the system switch.

CAUTION:

In an Expansion Port Network (EPN) system, do not cut or bend the fiber optic cable(s). Doing so may impede or sever communication between the Expansion Port Network cabinet [G3i] and the Processor Port Network cabinet.

CAUTION:

To avoid damaging the cable-to-connector interface when removing any Inter-Carrier Cable (A,B, or C) in a High or Critical Reliability system, take hold of the cable connector, not the cable itself.

Class 1 Laser Device

The DEFINITY ECS contains a Class 1 Laser device if single-mode fiber optic cable is connected to a remote Expansion Port Network (EPN). The LASER device operates within the following parameters:

Power Output: -5 dBm
Wavelength: 1310 nm
Mode Field Diameter: 8.8 microns

CAUTION:

Use of controls or sadjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Contact your Lucent Technolgies representative for more information.

Security Issues

A number of matters concerning maintenance are affected by security issues. For details, be sure to consult the *GBCS Products Security Handbook*, 555-025-600.

Electromagnetic Compatibility Standards

This product complies with and conforms to the following:

- Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment, EN55022 (CISPR22), 1993
- EN50082-1, European Generic Immunity Standard
- FCC Parts 15 and 68
- Australia AS3548

NOTE:
The system conforms to Class A (industrial) equipment. Voice terminals meet Class B requirements.

- Electrostatic Discharge (ESD) IEC 1000-4-2
- Radiated radio frequency field IEC 1000-4-3
- Electrical Fast Transient IEC 1000-4-4
- Lightning effects IEC 1000-4-5
- Conducted radio frequency IEC 1000-4-6
- Mains frequency magnetic field IEC 1000-4-8
- Low frequency mains disturbance

The system conforms to the following:

- Electromagnetic compatibility General Immunity Standard, part 1; residential, commercial, light industry, EN50082-1, CENELEC, 1991
- Issue 1 (1984) and Issue 2 (1992), Electrostatic discharge immunity requirements (EN55024, Part 2) IEC 1000-4-2
- Radiated radio frequency field immunity requirements IEC 1000-4-3
- Electrical fast transient/burst immunity requirements IEC 1000-4-4

European Union Standards

Lucent Technologies Business Communications Systems declares that the DEFINITY equipment specified in this document bearing the “CE” mark conforms to the European Union Electromagnetic Compatibility Directives.

The “CE” (Conformité Européenne) mark indicates conformance to the European Union Electromagnetic Compatibility Directive (89/336/EEC) Low Voltage Directive (73/23/EEC) and Telecommunication Terminal Equipment (TTE) Directive (91/263/EEC) and with i-CTR3 Basic Rate Interface (BRI) and i-CTR4 Primary Rate Interface (PRI) as applicable.

The “CE” mark is applied to the following Release 5 products:

- Global AC powered Multi-Carrier Cabinet (MCC)
- DC powered Multi-Carrier Cabinet (MCC) with 25 Hz ring generator
- AC powered Single-Carrier Cabinet (SCC) with 25 Hz ring generator
- AC powered Compact Single-Carrier Cabinet (CSCC) with 25 Hz ring generator
- Enhanced DC Power System

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- PagePac® (trademark of the Dracon Division of the Harris Corporation)
- UNIX® (trademark of the Novell Corporation)

Related Documents

The following documents are useful for system-related information:

- *DEFINITY Enterprise Communications Server Release 5 Feature Description*, 555-230-301
- *DEFINITY Enterprise Communications Server Release 5 System Description and Specifications*, 555-230-210
- *DEFINITY Enterprise Communications Server Release 5 Maintenance* for R5vs/si, 555-204-105
- *AT&T Network and Data Connectivity Reference*, 555-025-201
- *BCS Products Security Handbook*, 555-025-600
- *DEFINITY Wireless Business System Users Guide,* 555-232-105
- *DEFINITY Wireless Business System Installation and Test Guide,* 555-232-102
- *DEFINITY Wireless Business Systems System Interface*, 555-232-108
- *DEFINITY Enterprise Communications Server Release 5 Installation and Test for Multi-Carrier Cabinets*, 555-230-112
- *DEFINITY Enterprise Communications Server Release 5 Installation and Test for Single-Carrier Cabinets*, 555-230-894
- *DEFINITY Enterprise Communications Server Release 5 Implementation,* 555-230-302
- *DEFINITY Enterprise Communications Server Release 5 Upgrades and Additions for R5vs/si,* 555-230-120
- *DEFINITY Enterprise Communications Server Release 5 Upgrades and Additions for R5r,* 555-230-121

Maintenance Architecture

1

General

The maintenance subsystem is that part of the software that is responsible for initializing and maintaining the system. This software continuously monitors system health, and it maintains a record of errors detected in the system. The maintenance subsystem also provides a user interface for on-demand testing.

This chapter provides a brief description of the G3iV1, G3iV2, G3sV2, and G3vsV2 maintenance strategy, and it presents background information on the system's overall functions. For detailed descriptions of components and subsystems, refer to related topics in Chapter 11, "Maintenance Object Repair Procedures".

Maintenance Objects

The system is partitioned into separate entities called maintenance objects (MOs). Each MO is referred to by an upper-case, mnemonic-like name that serves as an abbreviation for the MO. For example, "CO-TRK" stands for "Central Office Trunk," "DUPINT" stands for "Duplication Interface Circuit Pack," and "PI-LINK" stands for "Processor Interface Link." Each MO is monitored by the system and has its own maintenance strategy. Most MOs, such as the expansion interface circuit pack (EXP-INTF), are individual circuit packs. Some MOs are hardware components that reside on part of a circuit pack. For example, the TDM bus clock (TDM-CLK) and tone generator (TONE-PT) circuits reside on the tone/clock circuit pack (TONE-BD). Other MOs, such as cabinet environmental sensors (CABINET), represent larger subsystems or sets of monitors. Finally, some MOs, such as synchronization (SYNC), represent processes or a combination of processes and hardware.

"Maintenance names" are recorded in the error and alarm logs. Individual copies of a given MO are assigned an address that defines the MO's physical location in the system. These physical locations are displayed as the "PORT" field in the alarm and error logs and as output of various commands such as **test board**, **busy tdm-bus**, etc. Repair instructions and a description of each MO appear alphabetically in Chapter 11, "Maintenance Object Repair Procedures". See the Table of Contents for a list of all MOs.

Alarm and Error Reporting

During normal operations, software or firmware may detect error conditions relevant to specific MOs. The system attempts to fix or circumvent these problems automatically. However, if a hardware component incurs too many errors, an alarm is raised. Typically, an alarm is generated according to the following sequence of events:

1. An error occurs in an MO.
2. The component notifies the maintenance software of the error. An error is detected in one of two ways:
   - For "in-line" errors, firmware on the component detects the occurrence of an error during ongoing operations.
   - For other types of errors, a "periodic test" or a "scheduled test" executed by software detects the error. These tests run at regular intervals, and they are administered by the **change system-parameters** command. The overall status of periodic and scheduled maintenance is displayed by the **status periodic-scheduled** command. The technician can also run these tests on demand by using the maintenance commands described in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", and Chapter 11, "Maintenance Object Repair Procedures".
   - Software logs the error in the error log, and it increments the error counter for that error. Whenever an error counter is "active," (that is, greater than zero), a maintenance record is maintained for the MO. A routine based on the strategy for maintaining that component is queued and run when resources are available.
     - For some error types, the routine executes additional tests called "analysis tests" on the component. Error counters associated with the tests are incremented or decremented based on the success or failure of these tests. If all tests pass, the maintenance record is retired.
     - In-line error counters are generally not associated with any specific test. These counters are automatically decremented over time at a rate specific to the error type. If the error occurs at a rate lower than the leak rate, the count for that error gradually decreases. If the error does not recur for a

while, the counter drops to zero, and the relevant maintenance record is retired. This process is known as the "leaky bucket" mechanism.

- When a counter exceeds its specific threshold value, an alarm is raised. Most alarms are raised by specific test failures. Each alarm is logged in the alarm log, and it remains active until the problem is resolved. Further testing with no failures, no further errors over a period of time, or repair actions can resolve an alarm.

  The system keeps a record of every alarm detected in the system. This record, along with the alarm log and the error log, can be displayed locally on the manager terminal remotely by Initialization and Administration System (INADS) personnel.

  An alarm is classified as MAJOR, MINOR, or WARNING, depending on its effect on system operation. Alarms are also classified as ON-BOARD or OFF-BOARD.

  — MAJOR alarms identify failures that cause a critical degradation of service. These alarms require immediate attention.

  — MINOR alarms identify failures that cause some service degradation but that do not render a crucial portion of the system inoperable. MINOR alarms require attention. However, typically a MINOR alarm affects only a few trunks or stations or a single feature.

  — WARNING alarms identify failures that cause no significant degradation of service or equipment failures external to the switch. These failures are not reported to INADS or to the attendant console.

  — ON-BOARD problems originate in the circuitry on the alarmed circuit pack.

  — OFF-BOARD problems originate in a process or component that is external to the circuit pack.

  Alarms are discussed further in Chapter 6, "Accessing Alarms and Errors", and in Chapter 11, "Maintenance Object Repair Procedures".

Maintenance Testing

The DEFINITY Communications System was designed to be easy to maintain and to have minimal down time. Most troubles are reduced to the circuit pack level and can be identified by LEDs on the circuit packs and software reports generated by the system.

The maintenance tests in the system can be divided into three groups:

- Periodic

  Background tests are performed by software maintenance, usually on an hourly basis. These tests are nondestructive and can be run during high traffic periods without interfering with calls.

- Scheduled

  Background tests performed by software maintenance, usually on a daily basis, generally more thorough than periodic testing. The tests are considered destructive and are run usually only during off-hours so as not to interfere with calls.

- Fixed interval

  Background tests performed by software maintenance at regular time intervals (these intervals cannot be administered). These tests run concurrently with periodic maintenance. The following table lists the MOs that run fixed interval testing.

Maintenance Object	Interval(min.)
POWER	60
SPE-SELEC	60
STBY-SPE	120
TDM-BUS	10
TONE-PT	10

Demand tests are also run by the system when it detects a need for them or by maintenance personnel when required in trouble-clearing activities. Demand tests include periodic tests plus other tests that are required only when trouble occurs. Some nonperiodic demand tests may disrupt system operation. In this manual, destructive (that is, service-disrupting) tests are identified in boldface type.

Maintenance personnel can use the DEFINITY Manager I terminal [G1], the Manager G3MT terminal [G3iV1.1-286, G3V2], or the Digital Equipment Corportation (DEC) VT220 terminal [G3iV2-386]. to initiate the same tests that the system initiates. Test results are displayed on the terminal screen.

The primary goals of maintenance are to detect, report, and clear troubles as quickly as possible with a minimum of service disruptions. Errors are often detected and corrected before any apparent failure occurs. This goal is supported by maintenance tests, automatic software diagnostic programs, and fault detection hardware.

Hardware Configurations and Power

2

General

This chapter discusses the hardware configurations contained within and supported by the DEFINITY Generic 1 and Generic 3 switches. Where appropriate, detailed information down to the circuit pack level is provided. The chapter also discusses the power sources required to enable the various components within the appropriate switch.

Generic 3 Circuit Packs

The following tables list all circuit packs supported by DEFINITY Generic 3 Systems. For information concerning vintages and current versions, see *Reference Guide for Circuit Pack Vintages and Change Notices* which is published periodically as a special edition of the *AT&T Technical Monthly*. For more information concerning which circuit packs are required for different environments and locales, see the Application Notes section of *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653 and *DEFINITY Communications System Generic 3 Version 5 Implementation,* 555-230-656.

Table 2-1 lists Generic 3 circuit packs by Apparatus Code, Name, and Type. See the *Reference Guide for Circuit Pack Vintages and Change Notices* for circuit packs that pertain to your system.

Table 2-1. Generic 3 Circuit Packs

Apparatus Code	Name	Type
120A	Channel Service Unit Module	Adjunct
122A	Music-on-Hold Interface	Adjunct
200A	Single-Mode Fiber Optic Transceiver	
631DA1	AC Power Converter	Power
631DB1	AC Power Converter	Power
644A1	DC Power Converter	Power
645B1	DC Power Converter	Power
649A	DC Power Converter	Power
676B	DC Power Supply	Power
982LS	Current Limiter	Power
9823	Multi-Mode Fiber Optic Transceiver	
CAT1500A	T1 Asynchronous Transfer Mode Interface	Service
CFY1B	Current Limiter	Power
CPP1	Memory Expansion	Control
ED-1E546 (TN2169) (TN2170) (TN566) (TN567)	DEFINITY AUDIX R3 System	Port Assembly
ED-1E546 (TN2208) (TN2170)	Call Visor ASAI over the DEFINITY (LAN) Gateway R1	Port Assembly
TN417	Auxiliary Trunk	Port
TN419B	Tone-Clock	Control
TN420B/C	Tone Detector	Service
TN429	Direct Inward/Outward Dialing (DIOD) Trunk	Port
TN433	Speech Synthesizer	Service
TN436B	Direct Inward Dialing Trunk	Port
TN437	Tie Trunk	Port
TN438B	Central Office Trunk	Port
TN439	Tie Trunk	Port
TN447	Central Office Trunk	Port

Continued on next page

Table 2-1. Generic 3 Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN457	Speech Synthesizer	Service
TN458	Tie Trunk	Port
TN459B	Direct Inward Dialing Trunk	Port
TN464C/ D/E/ F	DS1/E1 Interface - T1, 24 Channel - E1, 32 Channel	Port
TN465/B/C	Central Office Trunk	Port
TN467	Analog Line	Port
TN468B	Analog Line	Port
TN479	Analog Line	Port
TN497	Tie Trunk	Port
TN553	Packet Data Line	Port
TN556/B	ISDN-BRI 4-Wire S/T-NT Line (A-Law)	Port
TN570/B	Expansion Interface	Port
TN572	Switch Node Clock	Control
TN573/B	Switch Node Interface	Control
TN574	DS1C - T1, 24 Channel	Port
TN577	Packet Gateway - G3r Only	Port
TN722B	Digital Signal Level 1 Tie Trunk	Port
TN725B	Speech Synthesizer	Service
TN726/B	Data Line	Port
TN735	MET Line	Port
TN742	Analog Line	Port
TN744	Call Classifier	Service
TN744/B/C	Call Classifier - Detector	Service
TN744D	Call Classifier - Detector - Multi-Country	Service
TN746/B	Analog Line	Port
TN747B	Central Office Trunk	Port
TN748/B/C/D	Tone Detector	Service
TN750/B	Announcement	Service
TN750C	Announcement	Service

Continued on next page

Table 2-1. Generic 3 Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN753	Direct Inward Dialing Trunk	Port
TN754/B	Digital Line 4-Wire DCP	Port
TN755B	Neon Power Unit	Power
TN756	Tone Detector	Service
TN758	Pooled Modem	Port
TN760B/C/D	Tie Trunk	Port
TN762B	Hybrid Line	Port
TN763B/C/D	Auxiliary Trunk	Port
TN765	Processor Interface	Control
TN767B/C/D/E	DS1 Interface - T1, 24 Channel	Port
TN768	Tone-Clock	Control
TN769	Analog Line	Port
TN771D	Maintenance/Test	Service
TN772	Duplication Interface	Control
TN775/B	Maintenance	Service
TN776	Expansion Interface	Port
TN777/B	Network Control	Control
TN778	Packet Control	Control
TN780	Tone-Clock	Control
TN786	Processor	Control
TN786B	Processor	Control
TN789	Radio Controller	Control
TN790	Processor	Control
TN791	Guest Line (16-Port Analog Line)	Port
TNCCSC-1	CCSC-1 PRI to DASS Converter	Port
TNCCSC-2	CCSC-2 ISDN PRI to DPNSS Converter	Port
TNPRI/BRI	PRI to BRI Converter	Port
TNXXX	European Standard Paging Access (ESPA)	Adjunct
TN1648	System Access/Maintenance	Control
TN1650B	Memory	Control

Continued on next page

Table 2-1. Generic 3 Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN1654	DS1C - T1, 24 Channel	Port
TN1655	Packet Interface	Control
TN1656	Tape Drive	Control
TN1657	Disk Drive	Control
TN2135	Analog Line	Port
TN2136	Digital Line 2-Wire DCP	Port
TN2138	Central Office Trunk	Port
TN2139	Direct Inward Dialing Trunk	Port
TN2140/B	Tie Trunk	Port
TN2144	Analog Line	Port
TN2146	Direct Inward Dialing Trunk	Port
TN2147/C	Central Office Trunk	Port
TN2149	Analog Line	Port
TN2180	Analog Line	Port
TN2181	Digital Line 2-wire DCP	Port
TN2182/B	Tone-Clock - Tone Detector and Call Classifier	Control
TN2183	Analog Line	Port
TN2184	DIOD Trunk	Port
TN2198	ISDN-BRI 2-Wire U Interface	Port
TN2199	Central Office Trunk	Port
TN2202	Ring Generator	Service
TN2224	Digital Line, 24-Port, 2-Wire DCP	Control
UN330B	Duplication Interface	Control
UN331B	Processor	Control
UN332	Mass Storage/Network Control	Control
WP-90510	AC Power Supply	Power
WP-91153	AC Power Supply	Power

Cabinet Configurations

G1 and G3 DEFINITY supports a configuration consisting of a Processor Port Network (PPN) and up to two optional Expansion Port Networks (EPNs). (One EPN is supported in G1, and two EPNs are supported in G3i.) In G3s and G3vs, DEFINITY supports a configuration consisting of a single Processor Port Network (PPN).

NOTE:
G3s and G3vs do not support EPNs nor multicarrier cabinets.

In a G3i system, the PPN provides the control complex for the system along with a maximum of four port carriers in a multicarrier cabinet system and up to three port carriers in a single carrier cabinet system. If a G3i has High or Critical Reliability (see Chapter 8, "Reliability Systems: A Maintenance Aid"), the PPN cabinet has a second control carrier, and the maximum number of port carriers is reduced to three in a multicarrier cabinet system and to two port carriers in a single-carrier cabinet system. Each EPN enables the system to add up to four more port carriers in a multicarrier cabinet system and up to three in a single-carrier cabinet system. These cabinets house the main hardware of the system.

NOTE:
G3s and G3vs do not have High or Critical levels of Reliability.

The number of trunks and lines in a system determines the number of port carriers required. A fully-equipped PPN cabinet contains:

- Control Carrier—Houses power units, system logic, control circuit packs, and port circuit packs.
- Duplication Control Carrier [G3i or G3si+M only]—Optional, provides a second control complex, power units, control circuit packs, and port circuit packs.
- Port Carriers—House power units and up to 20 port circuit packs.
- Power Distribution Unit—
  - In a multicarrier cabinet system with AC power, provides backup power for system software and translations; contains a battery charger, and three batteries.
  - In a multicarrier cabinet system with DC power, provides a ringing voltage generator, an EMI filter, and a DC power relay.

— In a single-carrier cabinet system with AC power, provides a ringing voltage generator, an EMI filter, and a DC power relay.

— In a single-carrier cabinet system with DC power, provides a ringing voltage generator, an EMI filter, and a DC power relay.

- Wiring Harness and TDMLAN Cables.
- Fan Assembly—Circulates air through the cabinet.

Each fully equipped EPN contains [G3i or G3si only]:

- Expansion Control Carrier—Houses power units, the Expansion Interface circuit packs, up to 18 Port circuit packs, a Tone-Clock circuit pack, and a Maintenance circuit pack.
- Port Carriers—House power units and up to 20 Port circuit packs plus a service circuit pack.
- Power Distribution Unit—Provides a battery charger, three batteries, a ringing voltage generator, an EMI filter, and a DC power relay.
- Wiring Harness and Inter-Carrier TDM Cables.
- Fan Assembly—Circulates air through the cabinet.

In addition to the control carrier, each EPN can have up to four MCC port carriers (three in a single-carrier configuration). The number of trunks and lines in a system determines the number of port carriers needed. In a High or Critical Reliability system, an Expansion Interface circuit pack and a Tone-Clock circuit pack are housed in the port carrier located in EPN position B.

Figure 2-1 through Figure 2-23 show the various cabinet configurations available with the system. For more details, refer to *DEFINITY Communications System Generic 3 System Description*, 555-230-206.

631DA or 644A POWER UNIT (5V)	DUPN INTFC	PROCESSOR	MEMORY	MEMORY	PROCR INTFC 1	PROCR INTFC 2	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTCC	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 9	SEE NOTE 9	TAPE DRIVE	631DB or 645B POWER UNIT (-48V)
SEE NOTE 10	NOTE 1	TN773	TN770	NOTE 2	NOTE 3	NOTE 3	N0TE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 7								TN774	SEE NOTE 10
								PORT SLOT:		1	2	3	4	5	6	7	8	9		

Figure 2-1. Multicarrier Cabinet PPN Control Carrier A (J58890AH)

PPN System with a TN773 Processor[G3iV1.1 or G1]

Notes:

1. The TN772 Duplication Interface circuit pack is only for systems with High or Critical Reliability. In a Standard system, this slot is empty.
2. In G3iV1.1, this slot contains the TN770 Memory circuit pack. In G1, this slot is reserved for future use.
3. The TN765 Processor Interface circuit pack is an optional control circuit pack.
4. The Network Control Circuit Pack may be either a TN777 or a TN777B.
5. n G3iV1.1, the TN778 Packet Control circuit pack is an optional circuit pack. In G1, this slot is reserved for future use.
6. In G1, the Tone-Clock circuit pack must be a TN768. In G3iV1.1, the Tone-Clock circuit pack may be either a TN768 or TN780, depending on the external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.

7. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a G3iV1.1 system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 [G3iV1.1] Expansion Interface circuit pack, these slots support any Common Port circuit pack.
8. Port slots 1 through 9 support any Common Port circuit pack.
9. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
10. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B. (See Figure 2-1 for the correct power unit positions.)

631DA or 644A POWER UNIT (5V)	DUPN INTFC	PROCESSOR	CCP1	SEE NOTE 3	PROCR INTFC1	PROCR INTFC2	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE 9	SEE NOTE 9	SEE NOTE 9	SEE NOTE 9	SEE NOTE 9	SEE NOTE 10	SEE NOTE 10	631DB or 645B POWER UNIT (-48V)
SEE NOTE 11	NOTE 1	TN786	NOTE 2		NOTE 4	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 8	NOTE 8								SEE NOTE 11
									PORT SLOT:	1	2	3	4	5	6	7	8	9	

Figure 2-2. Multicarrier Cabinet PPN Control Carrier A (J58890AH)

PPN System with a TN786 Processor [G3iV2+]

Notes:

1. The TN772 Duplication Interface circuit pack is only for systems with High or Critical Reliability. In a Standard system, this slot is empty.

2. n G3iV2+, (expanded memory system) a memory child circuit pack (CPP1) is physically attached to the TN786B circuit pack, and it is considered part of this circuit pack.
3. This slot is empty.
4. The TN765 Processor Interface circuit pack is an optional control circuit pack in G1.
5. The Network Control circuit pack must be a TN777B. It cannot be a TN777.
6. The TN778 Packet Control circuit pack is an optional circuit pack.
7. The Tone-Clock circuit pack may be either a TN768 or TN780, depending on external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to "STRAT-3 (Stratum 3 Clock)]" Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.
8. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, these slots support any Common Port circuit pack.
9. Port slots 1 through 9 support any Common Port circuit pack.
10. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
11. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B. (See Figure 2-2 for the correct power unit positions.)

631DA or 644A POWER UNIT (5V)	DUPN INTFC	PROCESSOR	MEMORY	MEMORY	PROCR INTFC 1	PROCR INTFC 2	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 8	SEE NOTE 8	TAPE DRIVE	631DB or 645B POWER UNIT (-48V)
SEE NOTE 9	TN772	TN773	TN770	NOTE 1	NOTE 2	NOTE 2	NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 6								TN774	SEE NOTE 9
								PORT SLOT:		1	2	3	4	5	6	7	8	9		

Figure 2-3. Multicarrier Cabinet PPN Control Carrier B (J58890AJ)

High and Critical Reliability PPN Systems Only with a TN773 Processor

Notes:

1. In a 286 system, this slot contains the TN770 Memory circuit pack. In G1, this slot is reserved for future use.
2. The TN765 Processor Interface circuit pack is an optional control circuit pack in Generic 1.
3. The Network Control Circuit Pack may be either a TN777 or a TN777B.
4. In G3iV1.1, the TN778 Packet Control circuit pack is an optional circuit pack. In G1, this slot is reserved for future use.
5. In G1, the Tone-Clock circuit pack must be a TN768. In G3iV1.1, the Tone-Clock circuit pack may be either a TN768 or TN780, depending on the external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. "STRAT-3 (Stratum 3 Clock)]" Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.
6. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a G3iV1.1 system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support

packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 [G3iV1.1] Expansion Interface circuit pack, then these slots support any Common Port circuit pack.

7. Port slots 1 through 9 support any Common Port circuit pack.
8. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to"CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
9. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B. (See Figure 2-3 for the correct power unit positions.)

631DA or 644A POWER UNIT (5V)	DUPN INTFC	PROCESSOR	CCP1	SEE NOTE 2	PROCR INTFC 1	PROCR INTFC 2	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 9	SEE NOTE 9	631DB or 645B POWER UNIT (-48V)
SEE NOTE 10	TN772	TN786	NOTE 1		NOTE 3	NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 7								SEE NOTE 10
								PORT SLOT:		1	2	3	4	5	6	7	8	9	

Figure 2-4. Multicarrier Cabinet PPN Control Carrier B (J58890AJ)

High and Critical Reliability PPN Systems Only with a TN786 Processor

Control Carrier (J58890AH) With A TN790

The J58890AH is used in G3siV4+m and G3siV5+m systems.

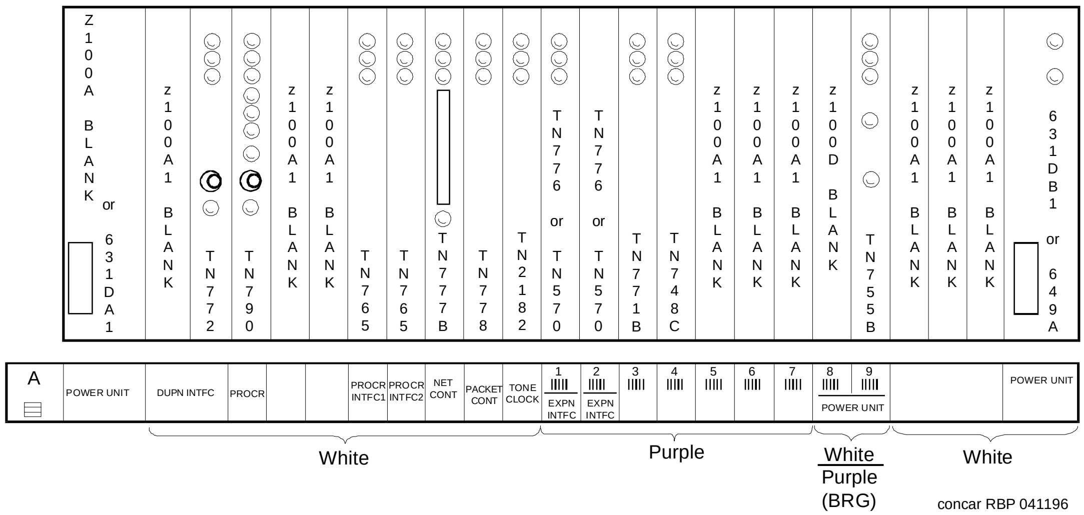


Figure 2-5. Control Carrier (J58890AH) — Front

This carrier has dedicated white-colored circuit pack slots that always contain specific control circuit packs. Purple-colored slots can contain any port circuit packs. Dual-colored slots may contain any port circuit pack or the designated white-colored circuit packs (such as an Expansion Interface or power unit). AC or DC power units supply power to the carrier.

NOTE:
The TN786B Processor circuit pack is used in G3siV4 and G3siV4+m systems. The optional CPP1 Memory circuit pack installed next to the TN786B Processor circuit pack is not used in G3 Release 5 and later systems. G3 Release 5 and later systems use the TN790 Processor circuit pack.

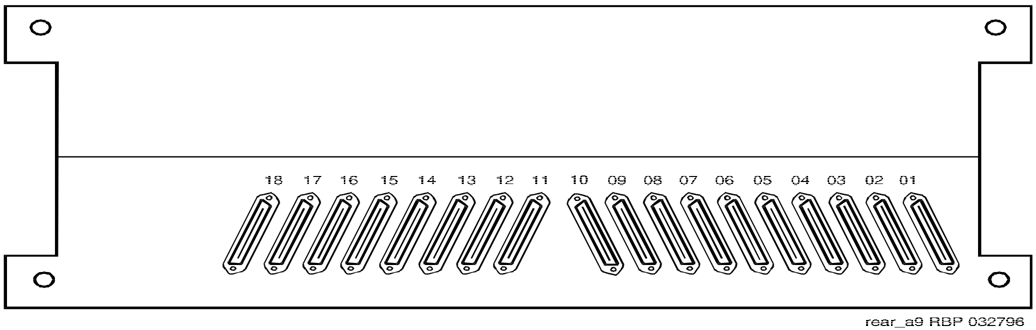


Figure 2-6. Control Carrier (J58890AH) — Rear

Table 2-2. Control Carrier (J58890AH) Connectors

Connector	Function
01 to 09 (B01 to B09)	50-pin connectors provide interfaces between port circuit packs and the Main Distribution Frame or fiber transceiver
AUX (Auxiliary)	Provides interface for customer alarms, attendant console power, or emergency power transfer panels. Provides interface for internal modem for remote maintenance
PI (Processor Interface)	Connects directly to the Processor Interface circuit pack. Provides a BX.25 protocol interface for communication between the circuit pack and external DCE equipment. This connection can only be used with standard reliability option
DCE (Data Communications Equipment)	Connects the processor to the Call Detail Recording (CDR) equipment or to an external modem for remote maintenance. This connector can be used with any reliability option
TERM (Terminal)	Connects a terminal to the processor in standard reliability systems. In critical reliability systems, connects a terminal to the processor in the Control Carrier
DOT (Duplication Option Terminal)	Used in high and critical reliability systems to connect an administration terminal to the active processor via the duplication interface slot position

Duplicated Control Carrier (J58890AJ) With A TN790

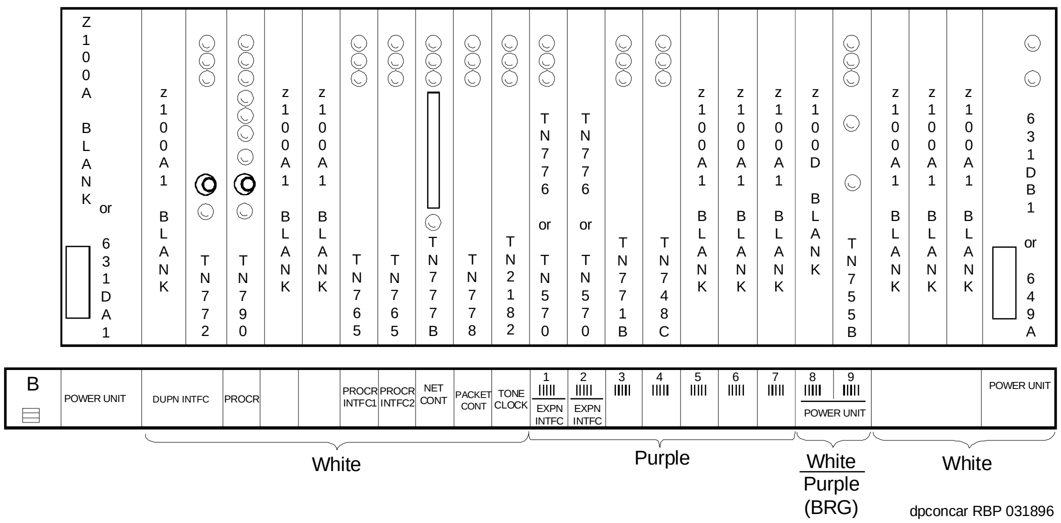


Figure 2-7. Duplicated Control Carrier (J58890AJ) — Front

The J58890AJ Duplicated Control Carrier is used in the G3siV4+m and G3siV5+m systems.

This carrier has dedicated white-colored circuit pack slots that always contain specific control circuit packs. The purple-colored circuit pack slots can be equipped with any port circuit packs. Dual-colored slots may contain any port circuit pack or the designated white-colored circuit packs (such as an Expansion Interface or power unit). AC or DC power units supply power to the carrier.

NOTE:
The TN786B Processor circuit pack is used in G3siV4 and G3siV4+m systems. The optional CPP1 Memory circuit pack installed next to the TN786B Processor circuit pack is not used in G3 Release 5 and later systems. G3 Release 5 and later systems use the TN790 Processor circuit pack.

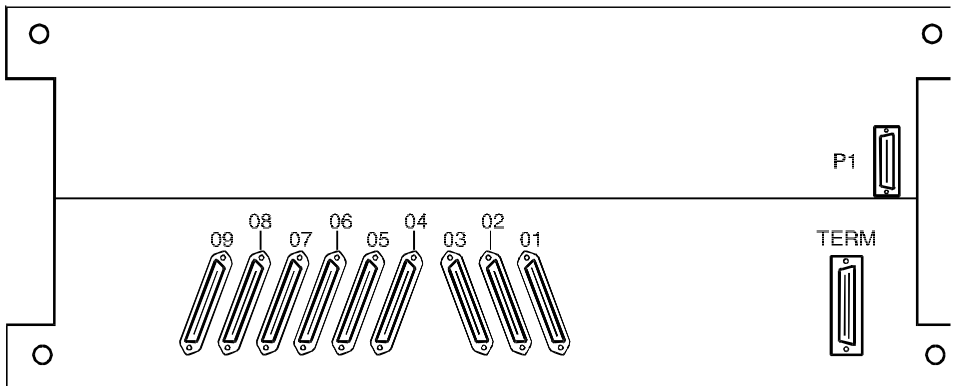


Figure 2-8. Duplicated Control Carrier (J58890AJ) — Rear View

Table 2-3. Duplicated Control Carrier (J58890AJ) Connectors

Connector	Function
01 to 09 (B01 to B09)	50-pin connectors provide interfaces between port circuit packs and the Main Distribution Frame (MDF) or fiber transceiver
TERM (Terminal)	Connects an administration terminal to the processor in the duplicated Control Carrier
AUX (Auxiliary)	Provides interface for customer alarms, attendant console power, emergency power transfer panels, and internal modem interface for remote maintenance

Notes

1. A memory child circuit pack (CPP1) is physically attached to the TN786B circuit pack, and it is considered part of this circuit pack.
2. This slot is empty.
3. The TN765 Processor Interface circuit pack is an optional control circuit pack in Generic 1.
4. The Network Control circuit pack must be a TN777B. It cannot be a TN777.
5. The TN778 Packet Control circuit pack is an optional circuit pack.
6. The Tone-Clock circuit pack may be either a TN768 or TN780, depending on external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock)

Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.

7. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN.
   In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.
8. Port slots 1 through 9 support any Common Port circuit pack.
9. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
10. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B. (See Figure 2-4 for the correct power unit positions.)

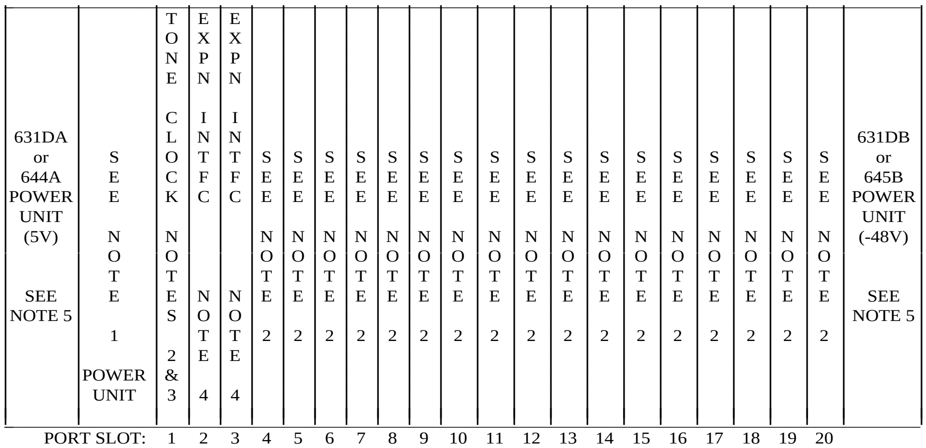


Figure 2-9. Multicarrier Cabinet Port Carrier (J58890BB)

PPN port carriers B [Standard Systems Only], C, D, and E EPN port carriers B, C, D, and E

Notes

1. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in the slots labeled "Power Unit." If this slot is not needed for the power unit, it may contain any service circuit packs. Service circuit packs are packs that, when inserted into the system, require no administration of ports. Service circuit packs include the following: Call Classifier (TN744), Announcement (TN750), Maintenance/Test (TN771C), Speech Synthesizer (TN725B), and Tone Detector (TN748C).
2. Port slots 1 through 20 support any Common Port circuit pack.
3. If the Port Carrier is the B carrier in an EPN of a system with Critical Reliability, port slot 1 must contain a Tone-Clock circuit pack. Otherwise, port slot 1 supports any Common Port circuit pack. The Tone-Clock circuit pack must be a TN768 or TN2182. The TN780 circuit pack is not used in EPNs/.
4. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 2 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 2 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 3. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.

5. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B (See Figure 2-9 for the correct power unit positions.) or a 649A replaces the 645B in the 645B slot, and the 644A slot is left blank.

631DA or 644A POWER UNIT (5V) SEE NOTE 5	MAINTENANCE TN775	TONE CLOCK NOTE 1	EXPN INTFC NOTE 2	EXPN INTFC NOTE 2	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 4	SEE NOTE 4	631DB or 645B POWER UNIT (-48V) SEE NOTE 5
PORT SLOT:			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	

Figure 2-10. Multicarrier Cabinet EPN Control Carrier A (J58890AF)

High and Critical Reliability Systems and Standard EPN Systems

Notes:

1. The Tone-Clock circuit pack may be either a TN768 or TN2182.
2. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, these slots support any Common Port circuit pack.
3. Port slots 1 through 19 support any Common Port circuit pack.
4. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in the port slots 18 and 19. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance for more details.

5. If a multicarrier cabinet is powered from an AC source, then the power unit must be a 631DA or 631DB. If a multicarrier cabinet is powered from a DC source, then the power unit must be a 644A or 645B. (See Figure 2-10 for the correct power unit positions.)

6. Only one 649A converter is required per carrier except for Switch Node (SN) carriers. SN carriers require two converters; one on each end. The use of the 649A allows an increase in the number of terminals supported per carrier.

   The 649A is not compatible with the 644A or the 645B Power Converters and is used in G3V4R3 and later systems.

   The 649A Power Converter converts a -48 VDC input into outputs of -48 VDC at 10 Amps, +5 VDC, and -5 VDC at 6 Amps. The outputs are distributed to circuit pack slots in the carriers.

TAPE DRIVE	DUPN INTFC	PROCESSOR	MEMORY	MEMORY	PROCR INTFC 1	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 9	SEE NOTE 9	WP-91153 or 676-B POWER SUPPLY
	NOTE 1	TN773	TN770	NOTE 2	NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 7									SEE NOTE 10
								PORT SLOT:	1	2	3	4	5	6	7	8	9	10	

Figure 2-11. Single-Carrier Cabinet PPN Control Carrier A (J58890L-1,L1)

PPN System with a TN773 G3iV1.1 or G1 Processor

Notes

1. The TN772 Duplication Interface circuit pack is only for a High or Critical Reliability system. In a Standard system, this slot is empty.
2. In G3iV1.1, this slot contains the TN770 Memory circuit pack. In G1, this slot is reserved for future use.

3. The TN765 Processor Interface circuit pack is an optional control circuit pack in Generic 1.
4. The Network Control Circuit Pack may be either a TN777 or a TN777B.
5. In G3iV1.1, the TN778 Packet Control circuit pack is optional. In G1, this slot is reserved for future use.
6. On G1, the Tone-Clock circuit pack must be a TN768. In G3iV1.1-286, the Tone-Clock circuit pack may be either a TN76 , TN780, or TN2182 depending on the external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.
7. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a G3iV1.1 system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, these slots support any Common Port circuit pack.
8. Port slots 1 through 10 support any Common Port circuit pack. If this carrier contains a TN769 Analog Neon circuit pack, a TN755B Power Unit circuit pack must be inserted in this carrier. The Power Unit circuit pack takes up two adjacent port slots. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance for more details.
9. If this carrier contains a TN769 Analog Neon circuit pack, a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
10. If the single-carrier cabinet is powered from an AC Power source, then the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, the power unit must be a 676-B.

DUPN INTFC	PROCESSOR	CCP1	SEE NOTE	PROCR INTFC	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	WP-91153 or 676-B POWER SUPPLY
NOTE 1	TN786	NOTE 2	3	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 8	NOTE 8	9	9	9	9	9	9	9	9	SEE NOTE 10
						PORT SLOT:		1	2	3	4	5	6	7	8	9	10	

Figure 2-12. Single-Carrier Cabinet PPN Control Carrier A (J58890L-1,L1)

PPN System with a TN786 Processor [G3iV2+]

Notes:

1. The TN772 Duplication Interface circuit pack is only for High and Critical Reliability systems. In a Standard system, this slot is empty.
2. In G3iV2, a memory child circuit pack (CPP1) is physically attached to the TN786 circuit pack, and it is considered part of this circuit pack. In G3s, this slot is empty.
3. This slot is always blank.
4. The TN765 Processor Interface circuit pack is an optional control circuit pack.
5. The Network Control circuit pack must be a TN777B. It cannot be a TN777.
6. The TN778 Packet Control circuit pack is an optional circuit pack.
7. The Tone-Clock circuit pack may be either a TN768, TN780, or TN2182 depending on external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.

8. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.
9. ort slots 1 through 10 support any Common Port circuit pack. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be inserted in this carrier. The Power Unit circuit pack takes up two adjacent port slots. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance for more details.
10. If the single-carrier cabinet is powered from an AC Power source, then the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, then the power unit must be a 676-B.

TAPE DRIVE	DUPN INTFC	PROCESSOR	MEMORY	MEMORY	PROCR INTFC 1	NETWORK CONTRL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE	WP-91153 or 676-B POWER SUPPLY
	TN772	TN773	TN770	NOTE 1	NOTE 2	NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 6	7	7	7	7	7	7	8	8	SEE NOTE 9
								PORT SLOT:	1	2	3	4	5	6	7	8	9	10	

Figure 2-13. Single-Carrier Cabinet PPN Control Carrier B (J58890M-1,L1)

High and Critical Reliability PPN System Only with a TN773Processor [G1 or G3iV1.1]

Notes:

1. In G3iV1.1, this slot contains the TN770 Memory circuit pack. In G1, this slot is reserved for future use.
2. The TN765 Processor Interface circuit pack is an optional control circuit pack.
3. The Network Control Circuit pack can be a TN777B or a TN777.
4. In G3iV1.1, the TN778 Packet Control circuit pack is an optional circuit pack. In G1, this slot is reserved for future use.
5. In G1, the Tone-Clock circuit pack must be a TN768. In G3iV1.1, the Tone-Clock circuit pack may be either a TN768 or TN780, depending on external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.
6. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a G3iV1.1 system in which packet-switching is supported, a TN570 Expansion Interface circuit pack

must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 [G3iV1.1] Expansion Interface circuit pack, then these slots support any Common Port circuit pack.

7. Port slots 1 through 9 support any Common Port circuit pack.

8. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.

9. If the single-carrier cabinet is powered from an AC Power source, then the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, then the power unit must be a 676B.

DUPN INTFC	PROCESSOR	CCP1	SEE NOTE 2	PROCR INTFC1	NETWORK CNTL	PACKET CONTROL	TONE CLOCK	EXPN INTFC	EXPN INTFC	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 8	SEE NOTE 9	SEE NOTE 9	WP-91153 or 676-B POWER SUPPLY
TN772	TN786	NOTE 1		NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 7									SEE NOTE 10
						PORT SLOT:		1	2	3	4	5	6	7	8	9	10	

Figure 2-14. Single-Carrier Cabinet PPN Control Carrier B (J58890AM)

High or Critical Reliability PPN System Only with a TN786 Processor

Notes:

1. In G3iV2+, a memory child circuit pack (CPP1) is physically attached to the TN786 circuit pack, and it is considered part of this circuit pack. In G3s, this slot is empty.

2. This slot is empty.

3. The TN765 Processor Interface circuit pack is an optional control circuit pack.
4. The TN778 Packet Control circuit pack is an optional circuit pack.
5. The Network Control circuit pack must be a TN777B. It cannot be a TN777.
6. The Tone-Clock circuit pack may be either a TN768, TN780 or TN2182 depending on external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.
7. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.
8. Port slots 1 through 9 support any Common Port circuit pack.
9. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be placed in port slots 8 and 9. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
10. If the single-carrier cabinet is powered from an AC Power source, then the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, then the power unit must be a 676B.

PORT SLOT:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	TONE CLOCK NOTE 1	EXPN INTFC NOTE 2	EXPN INTFC NOTE 2	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	WP-91153 or 676-B POWER UNIT SEE NOTE 4

Figure 2-15. Single-Carrier Cabinet Port Carrier (J58890BD)

PPN Port Carriers B [Standard Reliability System only], C, and D EPN Port Carriers B, C, and D

Notes:

1. If the Port Carrier is the B carrier in an EPN of a High or Critical Reliability system, port slot 1 must contain a Tone-Clock circuit pack. Otherwise, port slot 1 supports any Common Port circuit pack.
2. A TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.
3. Port slots 1 through 18 support any Common Port circuit pack. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be in this carrier. The Power Unit circuit pack takes up two adjacent ports slots. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance for more details.
4. If the single-carrier cabinet is powered from an AC Power source, then the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, the power unit must be a 676-B.

MAINTENANCE TN775	TONE CLOCK NOTE 1	EXPN INTFC NOTE 2	EXPN INTFC NOTE 2	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	WP-91153 or 676-B POWER SUPPLY SEE NOTE 4
PORT SLOT:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

Figure 2-16. Single-Carrier Cabinet EPN Control Carrier A (J58890N)

Std, High and Critical Reliability EPN Systems

Notes:

1. In G1, the Tone-Clock circuit pack must be a TN768. In G3i or G3si, the Tone-Clock circuit pack can be a TN768 or TN2182. EPNs do not support the TN780 circuit pack.
2. In G1, a TN776 Expansion Interface circuit pack must be inserted into port slot 1 if the system has an EPN. In a G3 system in which packet-switching is supported, a TN570 Expansion Interface circuit pack must be inserted into port slot 1 if the system has one EPN. If the system has two EPNs, then a second TN570 Expansion Interface circuit pack must be inserted into port slot 2. If the system does not support packet-switching, then a TN776 Expansion Interface circuit pack may be substituted for the TN570. If the system does not require either a TN776 or a TN570 Expansion Interface circuit pack, then these slots support any Common Port circuit pack.
3. Port slots 1 through 17 support any Common Port circuit pack. If this carrier contains a TN769 Analog Neon circuit pack, then a TN755B Power Unit circuit pack must be in this carrier. The Power Unit circuit pack requires two adjacent port slots. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance for more details.
4. If the single-carrier cabinet is powered from an AC Power source, the power unit must be a WP-91153. However, if the single-carrier cabinet is powered from a DC Power source, the power unit must be a 676-B.

SEE NOTE 1	PROCESSOR TN786B	CCP1 NOTE 2	PROCR INTFC NOTE 3	NETWORK CNTL NOTE 4	PACKET CONTROL NOTE 5	TONE CLOCK NOTE 6	SEE NOTE 7	SEE NOTE 7	SEE NOTE 8	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 9	SEE NOTE 9	WP-91153/L2 or 676-B POWER SUPPLY SEE NOTE 10
						PORT SLOT:	1	2	3	4	5	6	...	14	15	16	

Figure 2-17. Enhanced Single Cabinet Carrier A (J58890L-1,L5)

Standard, High, and Critical Reliability Systems with a TN786 Processor

SEE NOTE 1	PROCESSOR TN786B	CCP1 NOTE 2	PROCR INTFC NOTE 3	NETWORK CNTL NOTE 4	PACKET CONTROL NOTE 5	TONE CLOCK NOTE 6	SEE NOTE 7	SEE NOTE 7	SEE NOTE 8	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 9	SEE NOTE 9	WP-91153/L2 or 676-B POWER SUPPLY SEE NOTE 10
					PORT SLOT:		1	2	3	4	5	6	...	14	15	16	

Figure 2-18. Enhanced Single Cabinet Carrier B (J58890M-1,L5)

High or Critical Reliability System with a TN786Processor

NOTE:
The following notes pertain to each of the two preceding carrier figures.

Notes:

1. In G3s, this slot is blank. In G3iV2+, this slot contains the TN772 Duplication Interface circuit pack.
2. In G3iV2+ (expanded memory system), a memory child circuit pack (CPP1) is physically attached to the TN786 circuit pack, and it is considered part of this circuit pack. In G3s, this slot is empty.
3. The TN765 Processor Interface circuit pack is an optional control circuit pack.
4. The Network Control circuit pack must be a TN777B. It cannot be a TN777.
5. The TN778 Packet Control circuit pack is an optional circuit pack
6. The Tone-Clock circuit pack may be either a TN768, TN780 or TN2182 depending on the external clock used. If the Stratum 3 clock is used, the Tone-Clock circuit pack must be a TN780. Refer to STRAT-3 (Stratum 3 Clock) Maintenance documentation for the difference between the TN768 and the TN780. To support a Stratum 3 Clock, a special installation for the

TN780 Tone-Clock circuit pack is required. Refer to *DEFINITY Communications System Generic 3 V1.1 and V2 Upgrades and Additions*, 555-230-107 for details.

7. Port slots 1 through 16 support any Common Port circuit pack.
8. This slot supports any Common Port circuit pack, except for the TN750 Announcement circuit pack.
9. If this carrier contains a TN769 Analog Neon circuit pack, a TN755B Power Unit circuit pack must be placed in port slots 15 and 16. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for more details.
10. If the single-carrier cabinet is powered from an AC Power source, the power unit must be a WP-91153/L2. However, if the single-carrier cabinet is powered from a DC Power source, the power unit must be a 676B.

Basic Control Cabinet (J58890L)

The basic Control Cabinet is located in the Processor Port Network (PPN) only and contains ports, a control complex to perform call processing, and an interface to an optional duplicated control cabinet.

Figure 2-19 shows a basic Control Cabinet containing dedicated white-colored circuit pack slots that house specific control circuit packs. Purple-colored slots can be equipped with any port circuit packs. Also see Table 2-4. Dual-colored slots may contain any port circuit pack or the designated white-colored circuit packs (such as an Expansion Interface or power unit). AC or DC power units supply power to the carrier.

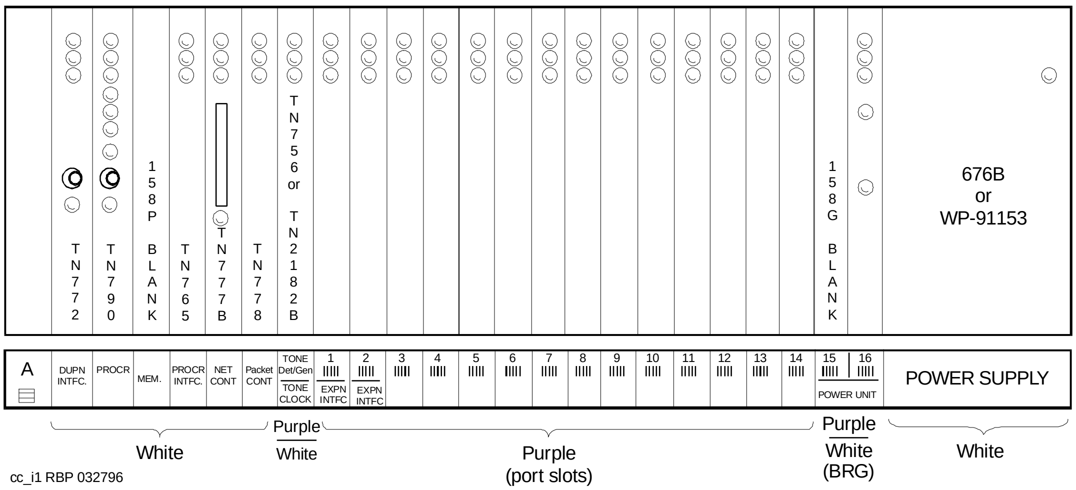


Figure 2-19. Basic Control Cabinet (J58890L) — Front

NOTE:
The TN786B Processor circuit pack is used in G3siV4 and G3siV4+m systems. The optional CPP1 Memory circuit pack installed next to the TN786B Processor circuit pack is not used in G3 Release 5 and later systems. G3 Release 5 and later systems use the TN790 Processor circuit pack.

Figure 2-20 and Table 2-4 describe connectors on the control cabinet rear panel.

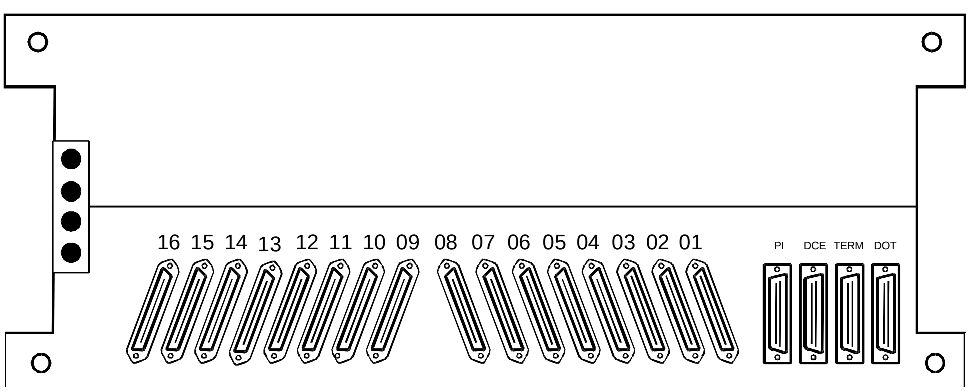


Figure 2-20. Basic Control Cabinet (J58890L) — Rear

Table 2-4. Basic Control Cabinet (J58890L) Connectors

Connector	Function
01 to 16 (A01 to A16)	50-pin connectors interface between port circuit packs and the Main Distribution Frame (MDF) or a fiber transceiver
AUX (Auxiliary)	Provides interface for customer alarms, attendant console power, emergency power transfer panels, and internal modem for remote maintenance
PI (Processor Interface)	Connects directly to the processor interface circuit pack. This connector is used only in AC-powered standard reliability systems
DCE (Digital Communications Equipment)	Connects the processor to Call Detail Recording (CDR) equipment or an external modem for remote maintenance
TERM (Terminal)	Connects an administration terminal to the processor circuit pack in standard reliability systems. Can be used to access the standby Switch Processing Element (SPE)
DOT (Duplication Option Terminal)	Used in high reliability and critical reliability systems to connect an administration terminal to the active processor via the duplication interface slot

Duplicated Control Cabinet (J58890M)

The Duplicated Control Cabinet is optional and is located only in the PPN in G3siV4+m and G3siV5+m. See Figure 2-21. This cabinet contains ports, a duplicated control complex, and an interface to a designated Expansion Control Cabinet.

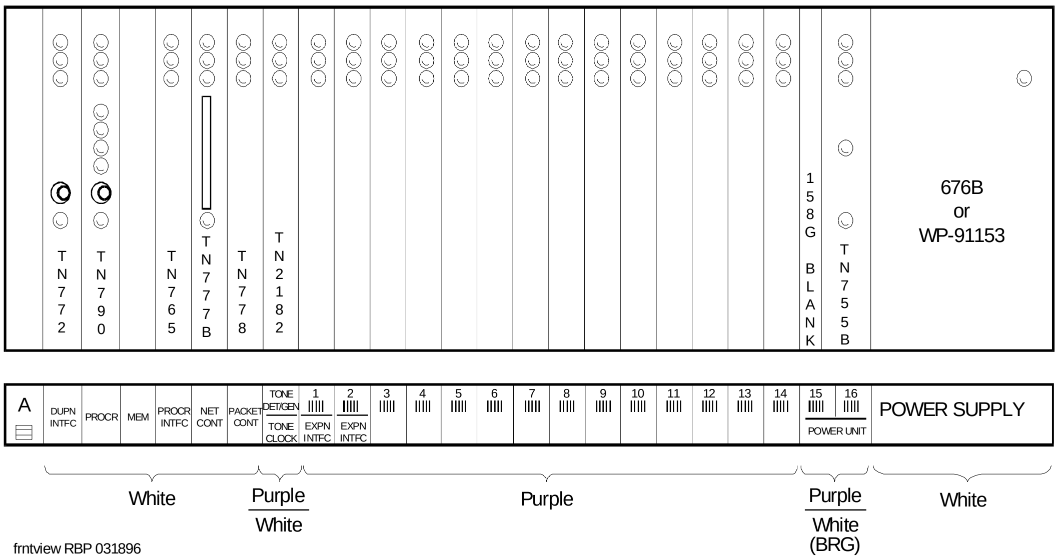


Figure 2-21. Duplicated Control Cabinet (J58890M) — Front

The cabinet contains dedicated white-colored circuit pack slots that are only equipped with designated control circuit packs. The purple-colored circuit pack slots can be equipped with any port circuit packs.

An AC or DC power supply, located at right side of the cabinet, supplies power to the cabinet. The cabinet is equipped with a duplication interface circuit pack in slot DUPN INTFC.

NOTE:

The TN786B Processor circuit pack is used in G3siV4 and G3siV4+m systems. The optional CPP1 Memory circuit pack installed next to the TN786B Processor circuit pack is not used in G3 Release 5 and later systems. G3 Release 5 and later systems use the TN790 Processor circuit pack.

Figure 2-22 and Table 2-5 describe the connectors on the rear of the Duplicated Control Cabinet.

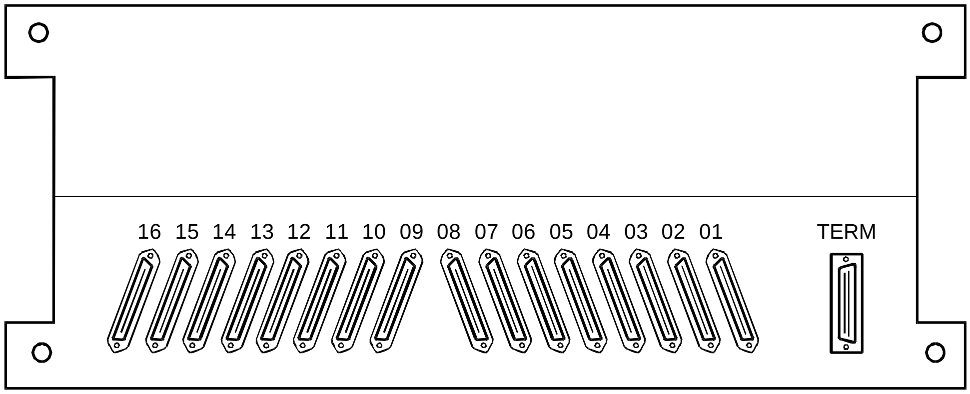


Figure 2-22. Duplicated Control Cabinet (J58890M) — Rear

Table 2-5. Duplicated Control Cabinet (J58890M) Connectors

Connector	Function
01 to 16 (A01 to A16)	50-pin connectors provide interfaces between port circuit packs and the Main Distribution Frame (MDF) or a cable access panel (if provided)
TERM (Terminal)	Connects an administration terminal to the Processor circuit pack in the duplicated control cabinet if the duplication interface circuit pack fails in the Control Carrier

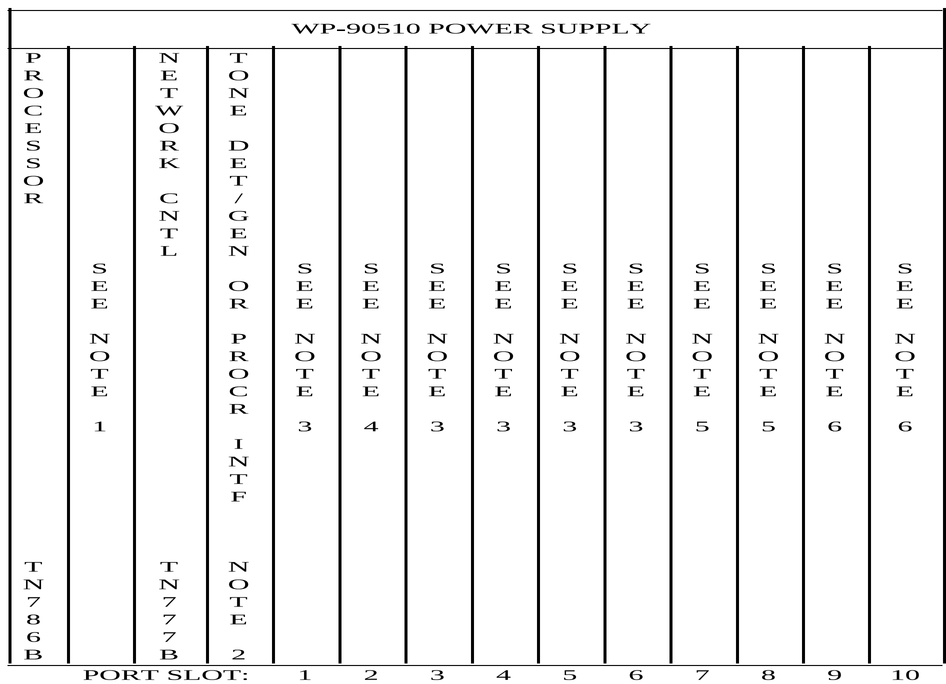


Figure 2-23. Compact Single Carrier Cabinet (J58890S)

Standard Reliability System with a TN786 or TN790 Processor

Notes:

1. This slot is always blank.
2. This slot can support either the TN765 Processor Interface circuit pack or the TN756 or the TN2182 Tone Detector/Generator circuit pack. However, the slot supports neither the TN780 Tone-Clock circuit pack nor the TN768 Tone-Clock circuit pack.
3. Slots 1 through 10 support any Common Port circuit pack.
4. If either Tone-Clock circuit pack (for example, a TN768 or TN780) is required in the system, it must be included in this slot. If neither of these circuit packs is required, this slot supports any Common Port circuit pack. Also, if the system includes both a TN765 Processor Interface circuit pack and a TN756 or TN2182 Tone Generator/Detector circuit pack, the TN756 or TN2182 circuit pack must be included in this slot. However, the TN756

Tone Detector/Generator circuit pack must be replaced with a TN2182, TN780 or TN768 Tone-Clock circuit pack whenever the system supports either a DS1 Interface or Outward Call Management.

5. If DEFINITY AUDIX. is included in the system, the assembly occupies port slots 7, 8, 9, and 10.
6. If a neon message waiting lamp (North America only) is included in the system, port slots 9 and 10 contain the TN755 circuit pack.

Power Controls

There are two basic powering options available with the DEFINITY G1, and or G3 switches. These options include Alternating Current (AC) and Direct Current (DC). The switch cabinets and their associated power supplies can be powered by 120/208 volts AC either directly or from a Universal Power Supply (UPS) system (System 75 has only the 120-volt AC option). Alternatively, the cabinets and their power supplies may be powered by -48 volts DC from a battery power plant (this requires DC-to-DC conversion power units in the switch).

The G3vsV2 system requires between 80 and 264 or between 90 and 132 volts AC. The system can be powered directly or from the WP-90510 power supply. The DC powering option is not available with the G3vsV2 system.

Except for the G3vs system, each control cabinet in an AC-powered system (but only the processor control cabinet in the ESCC/SCC/XE control cabinet) has an internal battery that provides a short term holdover to protect the system against short power interruptions. This method is known as the Nominal Power Holdover Strategy. The battery is connected so that it automatically provides power if the AC service fails. The time and extent of the holdover varies according to the type of cabinet and to whether or not the system has a duplicated control complex.

Table 2-6 summarizes the response to the interruption of power service in DEFINITY systems without an internal holdover battery.

Table 2-6. Response to Power Service Interruption in DEFINITY Systems without an Internal Holdover Battery.

Cabinet Power Interruption	Less Than Power Supply Decay	Greater Than Power Supply Decay
-48 volt DC external power or multicarrier cabinet with UPS, no internal battery.	None on system, some impact on 48-volt powered circuits.	All calls dropped, system reloads.

The next two tables indicate various responses to the interruption of power service in DEFINITY systems that are equipped with an internal holdover battery. Table 2-7 provides a summary of holdover times for various DEFINITY configurations. Table 2-8 indicates the types of cabinet power interruption in DEFINITY Systems based on power holdover durations.

Table 2-7. Response to Power Service Interruption in DEFINITY Systems with an Internal Holdover Battery

System and Configuration	Cabinet	Holdover for Entire Cabinet (in seconds)	Holdover for Entire Control Carrier (in minutes)
G1:			
Standard	PPNMCC	10	10
High, Critical	PPNMCC	5	5
Standard/High, Critical	PPN SCC/ESCC	1/4	2
Standard/High, Critical[1]	EPN MCC	15	none
Standard/High, Critical	EPN SCC/ESCC	1/4	none
G3:			
Standard	PPNMCC	10	10
High, Critical	PPNMCC	10	5
Standard/High, Critical	PPN SCC/ESCC	1/4	2
Standard/High, Critical[2]	EPN MCC	15	none
Standard/High, Critical	EPN SCC/ESCC	1/4	none
System 75:			
V1, V2, V3	Medium	10	10
V1, V2, V3	XE	1/4	2

1 The holdover times listed are in effect if the EPN contains a TN775 maintenance circuit pack. However, if the EPN contains a TN775B maintenance circuit pack, the holdover time for the entire cabinet is 10 seconds, and the holdover time for the control carrier is 10 minutes.

2 The holdover times listed are in effect if the EPN contains a TN775 maintenance circuit pack. However, if the EPN contains a TN775B maintenance circuit pack, the holdover time for the entire cabinet is 10 seconds, and the holdover time for the control carrier is 10 minutes.

NOTE:
The following list defines the abbreviations that appear in Table 2-7:

- PPN—Processor Port Network
- EPN—Expansion Port Network
- MCC—Multicarrier Cabinet

- SCC—Single Carrier Cabinet
- ESCC—Enhanced Single Carrier Cabinet

Table 2-8. Types of Cabinet Power Interruption in DEFINITY Systems

System and Cabinet	Shorter Holdover Than That for Entire Cabinet	Longer Holdover Than That for Entire Cabinet, Shorter Holdover Than That for Control Carrier	Longer Holdover That for Control Carrier
G1:			
PPNSCC	No calls dropped	All calls dropped	System reload
PPNMCC	No calls dropped	Control carrier calls held	All calls dropped, system reloads
EPNSCC	No calls dropped	All calls dropped	All calls dropped, system reloads.
EPNMCC	No calls dropped	All calls dropped	All calls dropped, system reloads
G3V1, G3V2:			
PPNMCC	No calls dropped	All calls dropped	System reloads
EPNMCC	No calls dropped	Control carrier calls held	System reloads
EPNSCC	No calls dropped	All calls dropped	System reloads
System 75:			
XE Cabinet	No calls dropped	All calls dropped	System reloads
Medium Cabinet	No calls dropped	Calls in control carrier held, others dropped	All calls dropped, system reloads

NOTE:
The following list defines the abbreviations that appear in the table:

- PPN—Processor Port Network
- EPN—Expansion Port Network
- MCC—Multicarrier Cabinet
- SCC—Single Carrier Cabinet
- ESCC—Enhanced Single Carrier Cabinet

NOTE:
XE/SCC/ESCC does not originate any alarms. MCC logs errors and originates miscellaneous alarms for some circuits. Older System 75s originates an AC power failure alarm.

NOTE:
When EPN power is interrupted for greater than the cabinet holdover but less than the control carrier holdover, calls in the control carrier are held for the duration of the interruption but are dropped when power is restored.

Multicarrier/Medium Cabinet

The multicarrier cabinets (MCCs) used by the G3, G1, and System 75 systems have an internal battery system that supplies holdover power to the whole cabinet for a specific amount of time. The duration of this holdover power depends upon the version and configuration of the switch. This information is provided in Table 2-3. In System 75 V1, V2 & V3 and in Standard G1, G3 systems, for example, the internal battery system supplies power to the cabinet for 10 seconds. In High or Critical Reliability G1, G3 systems, the internal battery system happens to supply power to the cabinet for the same amount of time. In either case, power is also supplied to the port carriers in the Processor Port Network.

Similarly, in most cases, holdover power for the control carrier is provided. Once again, the duration of this holdover power depends upon the version and configuration of the switch, as is illustrated in Table 2-4.

The following explanation assumes that we are considering a G3V2 system with a simplex configuration. As a result, the holdover power for the entire cabinet lasts for 10 seconds, and the holdover power for the control carrier lasts for 10 minutes.

NOTE:
To make the following explanation relevant to another system and configuration, simply replace the time expressed in seconds within the paragraphs with the relevant time expressed in seconds that appears in Table 2-3. Similarly, perform the same substitution for the time expressed in minutes.

An AC power interruption to the cabinet that lasts fewer than 10 seconds is not noticed by the customer. After 10 seconds, the system powers down the port carriers in each cabinet, but the entire control carrier continues to be powered for 10 minutes. The circuit packs in the port carriers are "removed" by the software and, as a result, all connections are dropped.

Connections and call processing are preserved on the control carrier for the entire holdover period. After 10 minutes, the control carriers are powered down and the connections are dropped. The 10 minute interval does not exhaust a fully charged battery. The system is designed to sustain multiple AC service interruptions before the battery has time to recharge fully. After power is restored, the batteries are recharged by a circuit that monitors current and time. If the battery takes longer than 30 hours to recharge, a minor alarm is sent to INADS. This alarm indicates that the battery should be replaced or that the charging circuit should be repaired.

The 397 Battery Charger Circuit immediately detects the loss of AC power. Once AC power loss is detected, an AC power alarm is generated. (In older System 75s, this results in an alarm origination being sent to INADS.) Included with the AC power fail alarm are several other alarms associated with the loss of power. Several maintenance objects cause a major alarm to be reported (e.g., processor interface links, external DS1 timing), but generally no specific power-related major or minor alarm results. If the switch is accessed during the 10 minute interval, an AC power warning alarm appears in the active alarm log. After AC is restored, the alarm is cleared and appears in the alarm log as "resolved."

If AC power is restored during the 10 second interval, no service interruption results. If AC power is restored between 10 seconds and 10 minutes, service to the port carriers is restored after the software "reinserts" the circuit packs. This can take up to one minute, depending on the size of the system. Links that have their connectivity through the control carriers remain up unless they rely on hardware that is powered externally to the switch (for example, channel service units for DS1 facilities). If the CSU is not connected to a power reserve system, the DS1 facility is dropped.

If AC power is restored after 10 minutes (or, if the battery does not have sufficient capacity, in less than 10 minutes), the switch must reload all software and translation data, and it must "reinsert" all circuit packs. This process can take several minutes, depending on the size of the system. All links are re-established according to their initialization requirements. Note that, in some cases, human intervention may be required if some central office equipment has been busied out.

As an option, the internal battery may be omitted on MCC systems that are ordered with UPS. If the battery is omitted, and if the AC from the UPS fails, the system does not report an alarm.

Critical services or services that take a long time to restore (for example, digital announcement circuit packs) should be placed in control carriers, where they can be held up the longest. If AC power interruptions of longer than 10 minutes are frequent, and if the customer’s service requirements warrant, consideration should be given to equipping the system with either an external UPS system or an external DC power system.

Enhanced Single Carrier/XE and Single Carrier/XE Cabinets

In single carrier/XE cabinets, there is no internal AC wiring or distribution and no software interaction with the power system. The power supplies themselves take about 250 milliseconds (1/4 second) for the voltages to drop below limits.

The (E)SCC/XE control cabinet that houses the switch processing element (SPE) is the only cabinet that has an internal battery reserve. All other control cabinets and port cabinets have the 250 millisecond power supply decay delay, after which all connections and links associated with the cabinets are dropped.

The SPE control cabinet has a battery that furnishes power to the processor memory complex for a minimum of two minutes if the battery is fully charged. This battery is recharged after power is restored, but the charging process is not monitored by the system. The cabinet is not able to detect AC power loss, and it notices only a DC power output failure as the power supply output decays.

The memory contents are preserved, and the processor continues operating during the two minute period. However, the tone-clock circuit pack is not held over, and as a result, no connections are possible. The battery does not supply all the voltages necessary for the internal modem circuit on the processor circuit pack. As a result, no call is originated to INADS, and the switch cannot answer any calls. Thus, the switch cannot report any internal or external alarms during this period. After two minutes (or, depending on the condition of the battery, after less than two minutes), the processor and memory are lost, and the system is totally inactive.

If power is restored in less than 1/4 of a second, no calls are dropped. If power is restored between 1/4 of a second and two minutes, all calls are dropped, and memory is maintained. However, since the tone-clock was lost, the system undergoes a reset once the AC restoral process clears all calls and the alarm log (in which errors are retained). The switch keeps a record of the restart in the error log, but it might not detect a power error if the outage is between 1/4 of a second and one minute, during which time only a loss of clock and not a loss of the power failure that caused the loss of clock is logged. After one minute, a power error is logged. If the outage exceeds the battery holdover interval, the error logs and alarm logs are lost (since they cannot be saved to tape). Depending on the size of the system, it can take up to one minute to restore service to the ports. After a power outage of two minutes following the restoral of AC power, the system re-initializes from the tape. It takes about 10 minutes to restore service. Again, if the customer has frequent power outages or critical service needs, an external UPS or DC power system should be considered.

NOTE:
For more power control information, refer to AC-POWER (AC-Powered Systems), AC Power (DC-Powered Systems), CARR-POW (AC-Powered Systems), CARR-POW (DC-Powered Systems), DC-POWER, POWER (AC-Powered Systems), and POWER (DC-Powered Systems) Maintenance documentation.

Light-Emitting Diodes (LEDs)

Light-emitting diodes, or LEDs, are small, button-shaped lights that are positioned on the processors and circuit packs within the maintenance architecture. LEDs emit one of three colors (red, green, or amber), and they are turned on or off by the system to indicate various statuses and procedures involving maintenance. LEDs are fully discussed in Chapter 7, "LED Interpretation".

Management Terminals

3

General

Maintenance personnel can use the DEFINITY Manager I [G1] terminal, the Manager G3MT terminal, or the Digital Equipment Corporation (DEC) VT220 terminal to initiate the same tests that the system initiates. Test results are displayed on the terminal screen. This chapter illustrates these terminals, explains how to use them, and identifies the typical maintenance tasks that can be performed from them.

Manager I and Manager G3MT Terminals

The maintenance interface for the system technician is either the Manager I terminal (which is used in G1) or the Manager G3MT terminal. Each of these terminals may be referred to as an *administration terminal*. In fact, from now on, this is the term we will use in this manual.

The following terminals are supported as administration terminals:

- 513 Business Communications Terminal (BCT)
- 4410 Data Terminal
- 4425 Data Terminal
- 610 BCT
- 615 MT
- 715 BCS

In a Standard Reliability system (that is, one without High or Critical Reliability), the administration terminal is connected to the Processor circuit pack. In the Processor Port Network (PPN) of a High or Critical Reliability system , the administration terminal is connected to the Duplication Interface circuit pack in the (PPN). In the Expansion Port Network (EPN) of a Standard Reliability system or of a High or Critical Reliability system, the administration terminal is connected to the Maintenance circuit pack in the EPN.

Duplication Interface circuit pack A controls and monitors the same environment leads as the Maintenance/Tape Processor in a PPN system without High or Critical Reliability. Duplication Interface circuit pack A also supports the serial channel to the administration terminal in a PPN for a High or Critical Reliability system. The administration terminal is connected to Duplication Interface circuit pack A via a connector, labeled **DOT** (Duplication Option Terminal), on the back of carrier A. At any time, the administration terminal may be disconnected from Duplication Interface circuit pack A and connected directly to the Active Processor circuit pack by attaching the terminal to the connector labeled **TERM** on the Active carrier. This connection should be made only if the administration terminal fails to function, since a problem with the Duplication Interface circuit pack A may be present.

Typical tasks that can be performed at the administration terminal by technicians using maintenance commands are shown in the list that follows. (Maintenance commands are described in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

- Display Error and Alarm logs
- Test circuit packs
- Test system functions
- Busyout and release system equipment
- Reset the system
- Monitor the system
- Check status of maintenance objects
- Check system translations

Most maintenance functions performed at the local administration terminal can also be done remotely at the INADS (Initialization and Administration System).

Terminal Keyboard

The keyboard is equipped with cursor keys that enable the user to obtain data and editing keys that allow the user to make changes and corrections. The keyboard is also equipped with transaction keys that enable the user to perform certain functions by single key strokes. The three types of keys are described here.

Cursor Keys: Cursor keys are used to move the cursor between fields and pages on a screen form. The cursor must be positioned on a field before the user can add or change information in that field.

Editing Keys: Two editing keys, BACK SPACE and CLEAR, are provided.

BACK SPACE is used to erase the character at the current cursor position. The cursor moves one position to the left each time the key is pressed. If the cursor is at the first position of the data entry field, it erases the character at the first position. CLEAR when pressed simultaneously with the SHIFT is used to clear all data in a field on a screen form. The cursor must be positioned at the field the user wants to clear before CLEAR is pressed.

Transaction Keys: Three transaction keys, CANCEL, ENTER, and HELP, are provided. CANCEL is used to erase a form or command. Once the key is pressed, the system returns the user to the command (tasks request) level and asks for a new command. ENTER is used to store the data entered on a screen form in the system's memory. HELP is used to display information on the type of data that can be entered into the field associated with the current cursor position. The system displays all the permissible entries the user can input for that field. This key can be pressed at the "enter command" level to obtain a list of all commands.

Table 3-1 provides a description of functions and associated keys for each type of administration terminal supported. Function keys f1 through f8, on the 4410 and 4425 data terminals are automatically programmed by the system to the key functions indicated in the table.

The keyboards are shown in Figure 3-1, Figure 3-2, Figure 3-3, Figure 3-4, and Figure 3-5 for the 513 BCT, 4410 Data Terminal, 4425 Data Terminal, 610 BCT and 615 MT, and 715 BCS, respectively.

Table 3-1. Terminal Keys

For This Function	Terminal Type: 715[1]	513 or 610 or 615 MT[2]	4410 or 610 or 615 MT[3]	4425
	Press Key Below:			
To cancel a screen form or command Once the key is pressed, the system returns the user to the **enter command:** (tasks request) level. Any data entered on a screen form prior to pressing CANCL (Cancel) or f1 is ignored. For the 4410 or 4425, the associated f1 screen label (CANCEL) is automatically assigned.	Cancel	CANCL	f1	f1
To clear and redraw a screen form The system redraws the same screen. For the 4410 or 4425, the associated f2 screen label (REFRESH) is displayed when the **add**, **change**, or **display** command is entered and the screen form is displayed.	Clr/ Rfrsh	CLEAR RFRSH	f2	f2
To clear all data in a field The cursor must be positioned at the field the user wants to clear before pressing this key. For the 4410 or 4425, the associated f4 screen label (CLEAR FIELD) is displayed when the **add** or **change** command is entered and the screen form is displayed.	(shift) **Clear Home**	CLEAR RFRSH (shift)	f4	f4
To display the next page of a screen form Used to display the next page of a screen form that has more than one page. For the 4410 or 4425, the associated f7 screen label (NEXT PAGE) appears when the screen form has more than one page.	PAGE	f7	f7	

Continued on next page

Table 3-1. Terminal Keys — *Continued*

	Terminal Type			
	715[1]	513 or 610 or 615 MT[2]	4410 or 610 or 615 MT[3]	4425
For This Function	**Press Key Below:**			
To display the next page of a screen form Used to display the next page of a screen form that has more than one page. For the 4410 or 4425, the associated f7 screen label (NEXT PAGE) appears when the screen form has more than one page.	Page Down	PAGE	f7	f7
To display the previous page of a screen form Used to display the previous page of a form which has more than one page. For the 4410 or 4425, the associated f8 screen label (PREV PAGE) is displayed only when the screen has more than one page.	Page Up	PAGE (shift)	f8	f8
To display the first page of a multiple screen form Used to display the first page of multiple forms when using the command (typical—**display station xxxx count 1-10**). For the 4410 or 4425, the associated f6 screen label (NEXT FORM) is displayed only when multiple forms are to be displayed.	—	—	f6	f6

Continued on next page

Table 3-1. Terminal Keys — *Continued*

	Terminal Type			
	715[1]	513 or 610 or 615 MT[2]	4410 or 610 or 615 MT[3]	4425
For This Function	**Press Key Below:**			
To display help information for a field or command Used to display help information on the type of data that can be entered into the field associated with the current cursor position. The system displays all the possible entries the user can input for that field. This key can also be pressed at the "enter command" level to obtain a list of all the system commands. The HELP key can be pressed at other command levels to obtain a list of objects and entries for identifiers. For the 4410 or 4425, the associated f5 screen label (HELP) is displayed when the user logs into the system.	HELP	HELP	f5	f5
To move the cursor to the next field on a line If the cursor is in the last field on a line, then it moves to the first field on the next line. If the cursor is in the last field on the last line, then it moves to the first field on the first line.	→ or TAB or Return	→ or TAB →	→ or TAB	→ or TAB
To move the cursor to the previous field on a line If the cursor is in the first field on a line, then it moves to the last field of the previous line. If it is in the first field of the first line, then it moves to the last field of the last line.	← or TAB (shift)	← or TAB (shift) ←	← or TAB (shift)	← or TAB (shift)

Continued on next page

Table 3-1. Terminal Keys — *Continued*

For This Function	Terminal Type: 715[1]	513 or 610 or 615 MT[2]	4410 or 610 or 615 MT[3]	4425
	Press Key Below:			
To move the cursor to the next line If the cursor is on the last line, it moves to the first line.	↓	ROLL ↓	0 ↓	↓
To move the cursor to the previous line If the cursor is on the first line, it moves to the last line.	↑	ROLL ↑	2 ↑	↑
To store the data entered on a screen form Used to enter into system memory the data that is displayed on a screen form. For the 4410 or 4425, the associated f3 screen label (ENTER) is displayed when the add or change command is entered and the associated screen form is displayed.	Enter	ENTER	f3	f3
To update the BCMS screen form using Monitor commands(G1) Used to obtain immediate update of real time status reports for agents and splits. Used only with the BCMS **monitor bcms split** and **monitor bcms system** commands.	f6	f6	f6	f6

1 The 715 must be set to the "BCS" emulation mode, which causes it to function like a 615 equipped with a 513 emulation cartridge.

2 If a 513 emulation cartridge is used for a 610 or 615 MT, the 610 or 615 MT terminal keys function the same as the 513 terminal keys.

3 If a 513 emulation cartridge is not used with a 610 or 615 MT, the 610 or 615 MT terminal keys function the same as the 4410 keys.

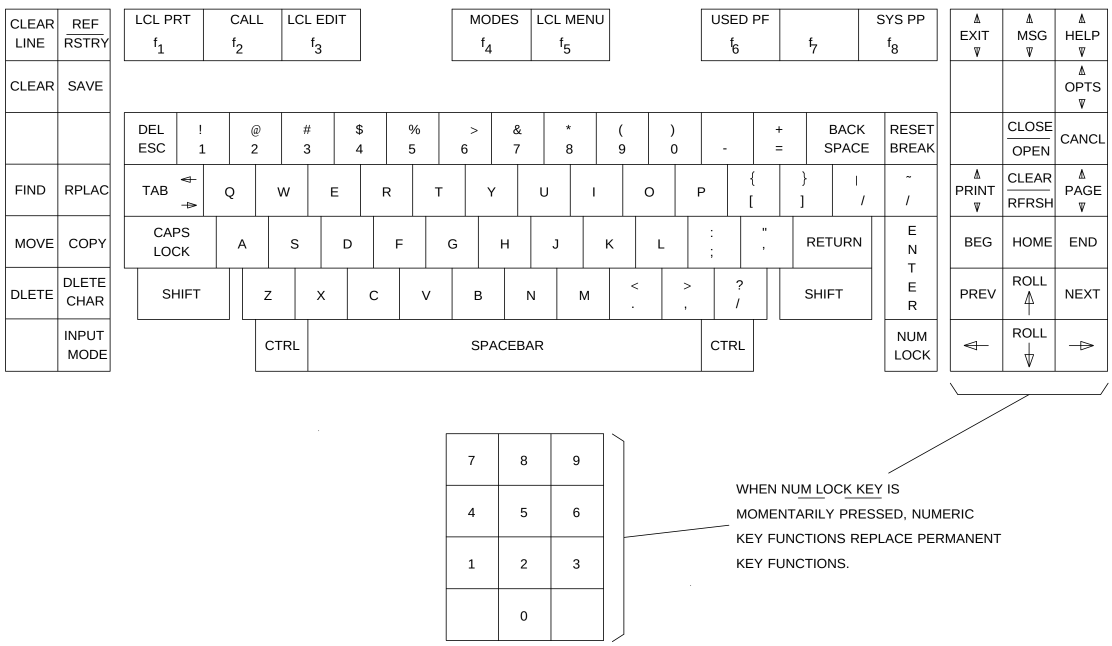


Figure 3-1. 513 Business Communications Terminal—Keyboard

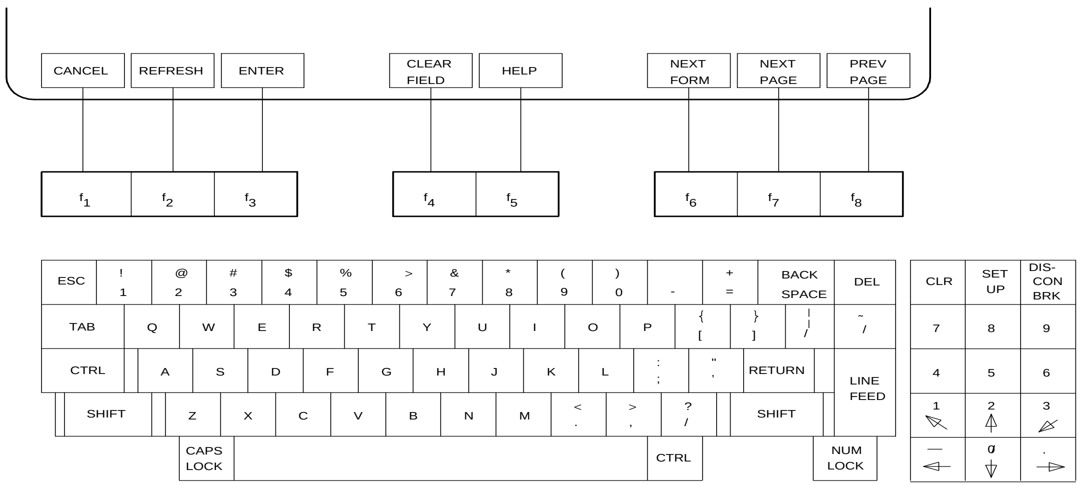


Figure 3-2. 4410 Data Terminal—Keyboard and Display Screen Function Keys

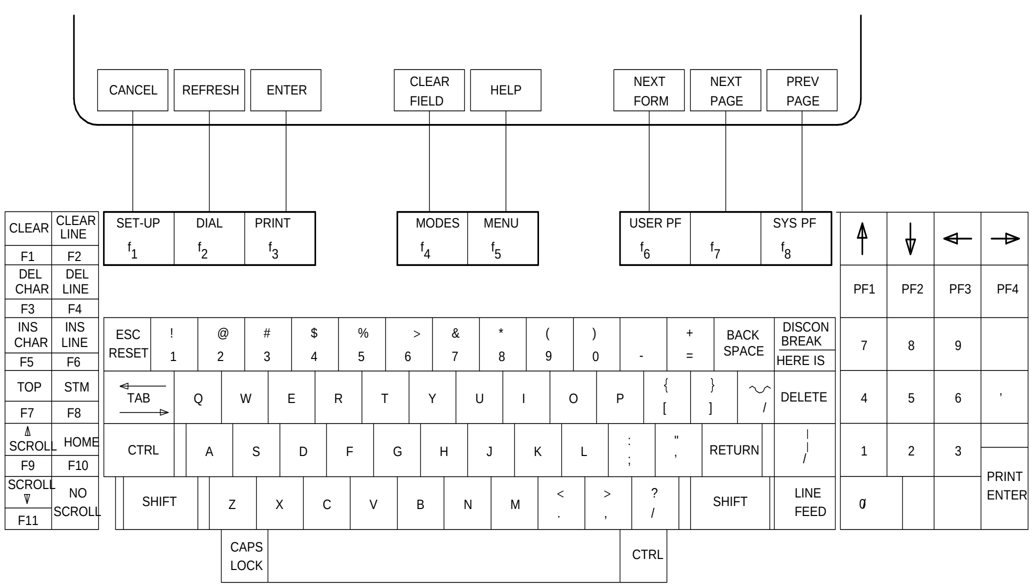


Figure 3-3. 4425 Data Terminal—Keyboard and Display Screen Function Keys

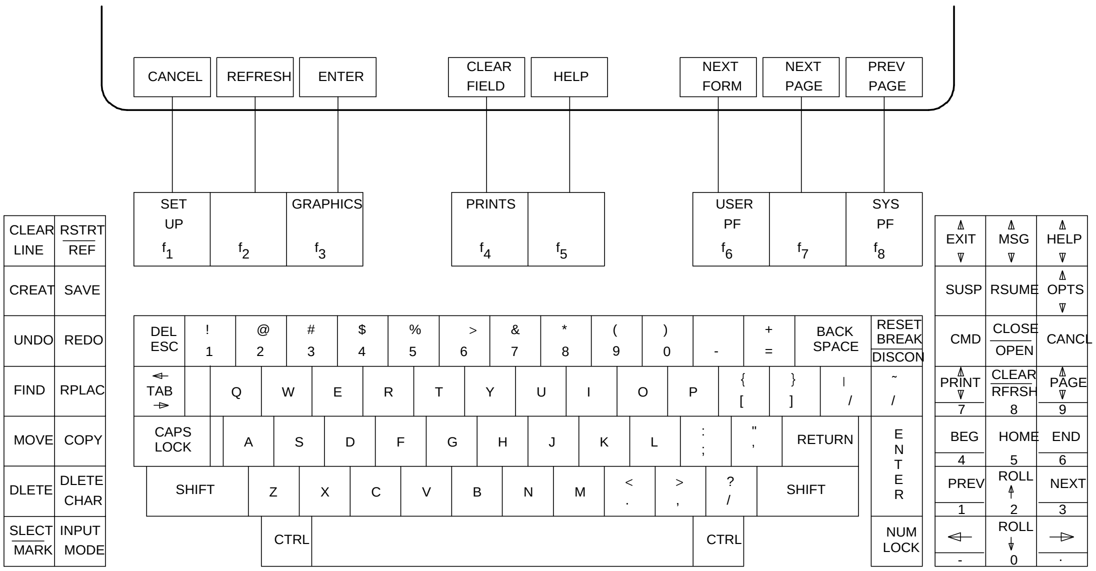


Figure 3-4. 610 BCT and 615 MT—Keyboard and Display Screen Function Keys

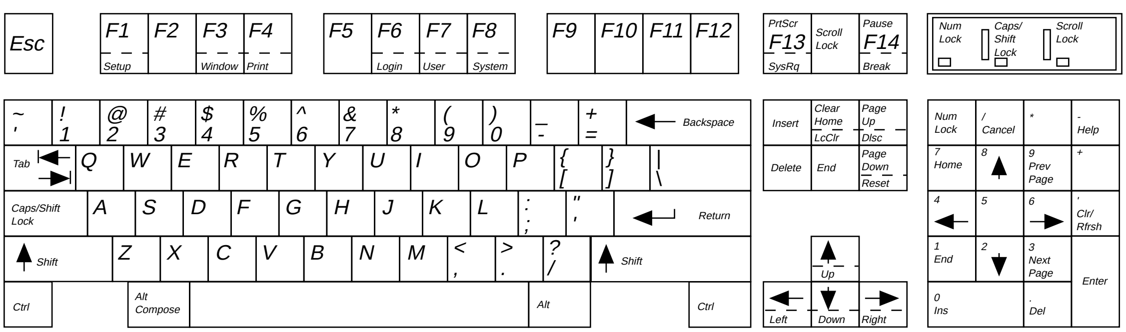


Figure 3-5. 715 BCS Terminal—Keyboard

System Login Procedure

Forced Password Aging and Administrable Logins for G3V3 and Later Releases

G3V3 and later releases provide enhanced login/password security by adding a security feature that allows users to define their own logins/passwords and to specify a set of commands for each login. The system allows up to 11 customer logins. Each login name can be customized and must be made up of from 3 to 6 alphabetic/numeric characters, or a combination of both. A password must be from 4 to 11 characters in length and contain at least 1 alphabetic and 1 numeric symbol. Password aging is an optional feature that the super-user administering the logins can activate.

NOTE:
If several “users” are logging in and out at the same time , a user may see the message “Transient command conflict detected; please try later”. After the “users” have completed logging in or out, the System Access Terminal should be available for use, try executing the command again.

The password for each login can be aged starting with the date the password was created, or changed, and continuing for a specified number of days (1 to 99). The user is notified at the login prompt, 7 days before the password expiration date, that his/her password is about to expire. When the password expires the user is required to enter a new password into the system before logging in. If a login is added or removed, the “Security Measurement” reports are not updated until the next hourly poll, or a **clear measurements security-violations** command is entered. Once a non-super-user has changed his/her password, the user must wait 24 hours to change the password again.

G3V4 security is enhanced by providing a logoff notification screen to a system administrator when he/she logs off while either the facility test call or remote access features are still administered. The administrator can be required to acknowledge the notification before completing the logoff process. Logoff notification is administered on the Login Administration screen.

G3V3 and later releases are delivered to the customer with one customer “super-user” login/password defined. The customer is required to administer additional login/passwords as needed. The super-user login has full customer permissions and can customize any login that he/she creates.

Login permissions for a specified login can be set by the super-user to block any object that may compromise switch security. In G3V3 or later releases up to 40 administration or maintenance objects commands can be blocked for a specified login in. In releases prior to G3V3, up to 20 administration or maintenance objects commands can be blocked for a specified login in. When an object (administrative or maintenance command) is entered in the blocked object list on the Command Permissions Categories Restricted Object List form, the associated administrative or maintenance actions cannot be performed by the specified login.

G3V3 and later releases commands are grouped into three command categories. Each of the three command categories has a group of command subcategories listed under them, and each command subcategory has a list of command objects that the commands acts on. A super-user can set a users permissions to restrict or block access to any command in these categories. The three main categories are:

- Common Commands
  - Display Admin. and Maint. Data
  - System Measurements
- Administration Commands
  - Administer Stations
  - Administer Trunks
  - Additional Restrictions
  - Administer Features
  - Administer Permissions
- Maintenance Commands
  - Maintain Stations
  - Maintain Trunks
  - Maintain Systems
  - Maintain Switch Circuit Packs
  - Maintain Process Circuit Packs

These categories are displayed on the Command Permissions Categories form.

To Log In

To log in to the switch:

1. Enter your login name and password on the login and password screen.

   If your password has expired you see the message:

   `Your password has expired, enter a new one.`

   `Reenter current password:`

```
        Login: telmgr

     Password:
     Your Password has expired, enter a new one.

Reenter Current Password:

             New Password:

     Reenter New Password:
```

Screen 3-1. Password Expiration Screen

The Password Expiration screen is displayed when you log in. If your password is expired you are prompted to enter a new password. If your password is within 7 days of the expiration date, you see:

WARNING: Your password will expire in X days

To Logoff

To logoff, enter “logoff” at the command prompt.

If facility test call notification or remote access notification are enabled for your login (see Adding Customer Logins and Assigning Initial Passwords, below), you will receive a logoff screen. If either the facility test call or remote access acknowledgments are required, you will need to respond to the Proceed with Logoff? prompt on the logoff screen. The response is defaulted to “n”; you will need to enter “y” to override the default.

CAUTION:
To leave the Facility Test Call administered after you logoff poses a significant security risk.

CAUTION:
To leave the Remote Access feature administered after logging off poses a significant security risk if you are using the feature in conjunction with the Facility Test Call feature.

```
Facility Test Call Administered
Remote Access Administered

Proceed with Logoff? [n]
```

Screen 3-2. Logoff Screen

To Display a Login

To display a specified login:

1. Enter the command **display login [login name]** and press the ENTER key.

   The system displays the requested login's:

   - Name
   - Login type
   - Service level
   - Disable following a security violation value (V3)
   - Access to Inads Port value (V4)
   - Password aging cycle length
   - Facility test call notification and acknowledgment
   - Remote access notification and acknowledgment

To List Logins

To list all of the system logins and the status of each login:

1. Enter the command **list logins**.

   The system displays the following information for all current logins:

   - Name
   - Service level
   - Status (active, inactive, disabled, svn-disabled, void)
   - Password aging cycle length

   The system will display only those logins with the same, or lower, service level as the requestor.

To Remove a Login

To remove a login from the system:

1. Enter the command **remove login [login name]**.

   The system displays the Login Administration form.

2. Press the ENTER key to remove the login, or press Cancel to exit the remove login procedure without making a change.

To Test a Login

1. Enter your login name at the login prompt.

```
Login: telmgr
Password:vvvvvvvvcf
```

Screen 3-3. Login Prompt Form

After the user enters the correct login name and password and the login is administered correctly, the system displays the command line interface.

Administering Customer Logins and Forced Password Aging for G3V3 and Later Releases

Adding Customer Logins and Assigning Initial Password

To add a customer login you must be a super-user, have administrative permissions, and:

1. Enter the **add login [name]** command to access the Login Administration form.

2. Enter your super-user password in the Password of Login Making Change field on the Login Administration form.

   The 3- to 6-character login name (characters 0-9, a-z, A-Z) entered with the **add login [name]** command is displayed in the Login's Name field.

3. Enter “customer” in the Login Type field. The system default for the Login Type field is “customer.” The maximum number of customer logins of all types is 11.

4. Enter super-user or non-super-user in the Service Level field. Default is none-super-user.
   - “super-user” gives access to the **add, change, display, list,** and **remove** commands for all customer logins and passwords. The super-user can administer any mix of super-user/non-super-user logins up to a total of ten additional system logins.
   - “non-super-user” permissions are limited by restrictions specified by the super-user when administering the non-super-user login. A non-super-user can change his/her password with permission set by the super-user, however once a password has been changed the non-super-user must wait 24 hours before changing the password again. A non-super-user cannot change other user passwords, login characteristics, or permissions.
5. Enter “y” in the Disable Following a Security Violation field to disable a login following a login security threshold violation,. This field is a dynamic field and only appears on the Login Administration form when the SVN Login Violation Notification feature is enabled. The system default for the Disable Following a Security Violation field is “y.”
6. Enter “y” in the Access to INADS Port? field to allow access to the remote administration port,. This field will only display if Acct. has first enabled customer super-user access to the INADS Remote Administration Port. Default is “n”. This step is valid for G3V4 only.
7. Enter a password for the new login in the Login’s Password field. A password must be from 4 to 11 characters in length and contain at least 1 alphabetic and 1 numeric symbol. Valid characters include numbers, and!&*?;’^(),.:- (the system will not echo the password to the screen as you type).
8. Re-enter the password in the Login’s Password field. The system will not echo the password to the screen as you type.
9. Enter the number of days (1 to 99) from the current day, that you want the password to expire, in the Password Aging Cycle Length field. If a you enter a blank in this field, password aging does not apply to the login.
10. Decide whether or not to leave the default of yes (“y”) in the Facility Test Call Notification? field. If you retain the default, the user will receive notification at logoff that the facility test call feature access code is administered. If you do not want the notification to appear, set the field to “n”.

    CAUTION:
    Leaving The facility Test Call administered after logging off poses a significant security risk.

11. Decide whether or not to leave the default of yes (“y”) in the Facility Test Call Notification Acknowledgment Required field. If you retain the default, the user will be required to acknowledge that they wish to logoff while

Facility Test Call is still administered. If you do not want to force the user to acknowledge, set the field to “n”. This field will appear only if the Facility Test Call Notification field is set to 'y”

12. Decide whether or not to leave the default of yes (“y”) in the Remote Access Notification? field. If you retain the default, the user will receive notification at logoff that remote access is still administered. If you do not want the notification to appear, set the field to “n”.

CAUTION:
To Leave Remote Access feature administered after logging off poses a significant security risk if you are using the feature in conjunction with the Facility Test Call feature.

13. Decide whether or not to leave the default of yes (“y”) in the Remote Access Acknowledgment Required? field. If you retain the default, the user will be required to acknowledge that they wish to logoff while remote access is still administered. If you do not want to force the user to acknowledge, set the field to “n”. This field will appear only if the Facility Test Call Notification field is set to 'y”.

```
                      LOGIN ADMINISTRATION

            Password of Login Making Change:

        LOGIN BEING ADMINISTERED
                             Login’s Name:xxxxxxx
                               Login Type:
                            Service Level:
     Disable Following a Security Violation?
                     Access to INADS Port?

        LOGIN’S PASSWORD INFORMATION
                         Login’s Password:
                 Reenter Login’s Password:
            Password Aging Cycle Length:

      LOGOFF NOTIFICATION
        Facility Test Call Notification? y     Acknowledgment Required? y
             Remote Access Notification? y     Acknowledgment Required? y
```

Screen 3-4. Login Administration

Changing a Login’s Attributes

To change a customer login’s attributes you must be a super-user, have administrative permissions (specifically, the Administration Permission field must be set to “y” for the super-user), and:

1. Enter the **change login [name]** command to access the Login Administration form.

2. Enter your super-user password in the Password of Login Making Change field on the Login Administration form.

   The 3- to 6-character login name (characters 0-9, a-z, A-Z) entered with the **change login [name]** command is displayed in the Login's Name field.

3. Enter "customer" in the Login Type field.

4. Enter "super-user" or "non-super-user" in the Service Level field.

   NOTE:
   You cannot change your own service level.

5. To disable a login following a login security threshold violation, enter "y" in the Disable Following a Security Violation field. This field is a dynamic field and only appears on the Login Administration form when the SVN Login Violation Notification feature is enabled.

6. To allow access to the remote administration port, enter "y" in the Access to INADS Port? field. This field will only display if Lucent Technologies has first enabled customer super-user access to the INADS Remote Administration Port and the G# version is V3 or later.

7. Enter a password for the new login in the Login's Password field. A password must be from 4 to 11 characters in length and contain at least 1 alphabetic and 1 numeric symbol. Valid characters include numbers, and!&*?;'^(),.:- (the system will not echo the password to the screen as you type).

8. Re-enter the password in the Login's Password field. The system will not echo the password to the screen as you type.

9. Enter the number of days (1 to 99) from the current day, when you wish the password to expire, in the Password Aging Cycle Length field. If a blank is entered in this field, password aging does not apply to the login.

Administering Login Command Permissions

Users with super-user permissions can set the permissions of the logins they create. The Command Permissions Categories form displays fields to which a user with super-user permissions can give or limit access. G3V3 and V4 commands are divided into three categories:

- Common Command
- Administration Commands
- Optional Maintenance Commands

Each of the three main categories have subcategories listed under them that when set to a "y" give permission to use the command sets associated with that category. When the Command Permissions Categories form is displayed for a login, the subcategories fields appear with the fields set to give the login full permissions for that login type. The super-user administering login permissions can set any of these field to deny access to a command category for the specified login. If the super-user making the assignments has full super-user permissions and would like to limit permissions for a category, the super-user can do so by entering “y” in the Additional Restrictions field located under the Administration Category section of the Command Permissions Categories form.

Refer to the Command Permissions Form Entries Tables at the end of this section for a list of command Objects and Actions by:

- Display Administration and Maintenance
- Administer Features
- Administer Permissions
- Administer Stations
- Administer Trunks

The information is the tables will help you to establish command permissions for user logins.

To administer command permissions, log in as super-user and:

1. Access the Command Permissions Categories form by entering the command **change permissions login [login name]**. When the Command Permission Categories form is displayed for a login, the default permissions for that “login type” are shown on the form. The super-user administering the login can change a “y” to “n” for each subcategory field on the form.
2. Select a category for the login and enter “y” in each field where permission to perform an administrative or maintenance action is needed. The command object you select must be within the permissions for the login type you are administering.

   If the Maintenance option is set to “y” on the Customer Options form, the super-user can enter “y” in the Maintain Switch Circuit Packs? or Maintain Process Circuit Packs fields.
3. A super-user with full super-user permissions (super-user administering the login cannot have the Additional Restrictions field set to “y” for his/her own login) can restrict additional administrative or maintenance actions for a specified login by entering “y” in the Additional Restrictions field on the Command Permission Categories form. Enter the additional restrictions for a login in the Restricted object list fields on the Command Permission Categories Restricted Object List form. In G3V3 and G3V4 you can enter up to 40 command names (object names) to block actions associated with a command category for a specified login; prior to G3V3 you can enter 20.

```
                                                        Page 1 of 3
                       COMMAND PERMISSION CATEGORIES
                         Login Name: Sup3ru
  COMMON COMMANDS
                Display Admin. and Maint. Data? y
                           System Measurements? _*

  ADMINISTRATION COMMANDS
        Administer Stations? y            Administer Features? y
          Administer Trunks? y         Administer Permissions? y
    Additional Restrictions? n

  MAINTENANCE COMMANDS
          Maintain Stations? n       Maintain Switch Circuit Packs? n
            Maintain Trunks? n      Maintain Process Circuit Packs? n
           Maintain Systems? n
```

Screen 3-5. Command Permission Categories (Page 1 of 3)

*This field is only displayed on the G3i (S or VS) systems.

```
                                                        Page 2 of 3

                         COMMAND PERMISSION CATEGORIES
                            RESTRICTED OBJECT LIST
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
               _______________________        ______________________
```

Screen 3-6. Command Permissions Categories (Page 2 of 3)

```
                                                              Page 3 of 3

                         COMMAND PERMISSION CATEGORIES
                            RESTRICTED OBJECT LIST
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
            _______________________       _______________________
```

Screen 3-7. Command Permissions Categories (Page 3 of 3)

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
aar analysis		X	X				
aar digit-conversion		X	X				
aar route-chosen			X				
abbreviated-dialing 7103A-buttons		X					
abbreviated-dialing enhanced		X					
abbreviated-dialing group		X	X				
abbreviated-dialing personal		X	X				
abbreviated-dialing system		X					
aca-parameters			X				
access-endpoint		X	X			X	X
adjunct-names		X					
adjunct-controlled-agents		X					
administered-connection		X	X			X	
agent-loginID		X	X				
alarms		X					X
alias-station		X					
alphanumeric-dial-table		X					
alternate-frl		X					
analog -testcall							X
announcements		X					
ars analysis		X	X				
ars analysis			X				
ars digit-conversion		X					
ars digit-conversion			X				
ars route-chosen			X				
ars-toll		X					
attendant		X	X				
bcms agent			X				
bcms loginIDs			X				
bcms split			X				

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
bcms trunk			X				
bcms vdn			X				
board							X
bri-port						X	
bridged-extensions			X				
bulletin-board		X					
button-location-aca		X					
cabinet		X	X				
call-forwarding			X				
call-screening		X					
capacity		X					
card-mem[1]						X	X
cdr-link						X	X
circuit-packs		X					
communication-interface hop-channels		X				X	
communication-interface links		X					
communication-interface proc-channels		X				X	
configuration all			X				
configuration board			X				
configuration carrier			X				
configuration control			X				
configuration network			X				
configuration software			X				
configuration station			X				
configuration trunk			X				
console-parameters		X					
cor		X	X				
cos		X					
coverage answer-group		X	X				
coverage groups		X					
coverage path		X	X				

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
customer-alarm							X
data-module		X	X			X	X
dialplan		X					
digit-absorption		X					
display-format		X	X				
do-not-disturb group			X				
do-not-disturb station			X				
ds1		X					X
dsp-msg-auto-wakeup		X					
dsp-msg-call-identifier		X					
dsp-msg-date-time		X					
dsp-msg-lwc		X					
dsp-msg-mct		X					
dsp-msg-miscellaneous		X					
dsp-msg-property-mgmt		X					
dsp-msg-softkey-label		X					
dsp-msg-tod-routing		X					
emergency			X				
enp-number-plan		X					
environment							X
errors		X					
events		X					
external-device-alarm							
extension-type			X				
external-device-alarming							X
feature-access-code		X					
fiber-link[2]		X	X				
groups-of-extensions			X				
hardware-group						X	X
health						X	
history			X				

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
hunt-group		X	X				
inads-link							X
integrated-annc-boards		X	X				
intercom-group		X	X				
interface[1]						X	X
intra-switch-cdr		X	X				
isdn cpn-prefix		X					
isdn network-facilities		X					
isdn-testcall							X
isdn tsc-gateway		X					
ixc-codes		X					
journal-printer							X
led							X
link						X	X
listed-directory-numbers		X					
login						X	
login[3]			X				
login-ids		X					
maintenance							X
marked-port			X				
mct-group-extensions		X					
mct-history			X				
meas-selection coverage		X					
meas-selection principal		X					
meas-selection route-pattern		X					
meas-selection trunk-group		X					
meas-selection wideband-trunk-grp		X					
measurements security-violations detail			X				
measurements security-violations summary			X				
memory							X

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
MO							X
modem-pool		X	X				X
multi-frequency signaling		X					
network-control							X
node-routing		X	X				
packet-control[1]						X	X
packet-interface[1]						X	
paging code-calling-ids		X	X				
paging-loudspeaker		X					
password	X						
periodic-scheduled						X	
permissions		X					
personal-CO-line		X	X				
pgate		X	X				
pickup-group		X	X				
pkt							X
pms						X	
pms-down			X				
pms-link							X
pms-log						X	
pnc						X	
port		X					X
port-network[1]						X	
pri-endpoint		X	X			X	X
processor							X
remote-call-coverage	X						
report-scheduler	X		X		X		
rhnpa		X					
route-pattern		X	X				
routing-table		X	X				
scr				X			

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
second-digit		X					
security-violations				X			
set-data			X				
signaling-group		X	X			X	X
sit-treatment		X					
site-data		X					
skill				X			
sp-link						X	X
spe						X	
stargate-port						X	
station		X	X				X
svn-button-location		X					
switch-node[1]						X	
synchronization		X				X	X
sys-link			X			X	
system				X			
system 1st-cabinet						X	
system 2nd-cabinet						X	
system 3rd-cabinet						X	
system all-cabinets						X	
system conn				X			
system customer-options		X					
system features		X					
system-maintenance		X					
system-parameters cdr		X					
system-parameters country-options		X					
system-parameters duplication[1]		X					
system-parameters hospitality		X					
system-parameters security		X					
tdm							X
term-ext-group		X	X				

Continued on next page

Table 3-2. Command Permissions Form Entries — Display Administration and Maintenance — *Continued*

Object	Action						
	Change	Display	List	Monitor	Remove	Status	Test
terminal-parameters 603/302B1		X					
terminal-parameters 8400		X					
test-schedule		X	X				
time		X					
time-of-day		X					
toll		X					
toll all			X				
toll restricted-call			X				
toll-list			X				
toll unrestricted-call			X				
tone-clock							X
trunk				X		X	X
trunk-group		X	X			X	
trunk-group-history			X				
trunk-group-members			X				
tsc-administered							X
tti						X	
udp		X					
udp			X				
unstaffed-agents			X				
usage button-type hunt-ns			X				
usage button-type trunk-ns			X				
usage button-type night-service			X				
usage-extensions			X				
usage-hunt			X				
vdn		X	X	X			
vector		X	X				
wakeup incomplete			X				
wakeup requests			X				
wakeup station			X				
wakeup-log						X	

Continued on next page

1 Intel only.
2 MIPS only.
3 Must be super-user

Table 3-3. Command Permissions Form Entries — Administer Features

	Action																
Object	**Add**	**Backup**	**Busyout**	**Change**	**Clear**	**Copy**	**Disable**	**Display**	**Duplicate**	**Enable**	**Erase**	**List**	**Release**	**Remove**	**Restore**	**Save**	**Set**
adjunct-names[1]				X													
adjunt-controlled-agents				X													
administered-connection	X			X			X		X	X				X			
agent-loginID	X			X										X			
alphanumeric-dial-table				X													
alternate-frl				X													
announcements						X					X				X	X	
authorization-code				X				X				X					
bulletin-board				X													
cabinet[1]	X			X										X			
call-screening				X													
circuit-packs				X													
communication-interface hop-channels				X													
communication-interface links				X													
communication-interface processor-channels				X													
cor				X													
cos				X													
coverage answer-group	X			X										X			
coverage-path	X			X										X			
dialplan				X													
disk[1]		X													X		
display-format				X													
ds1	X			X										X			
dsp-msg-auto-wakeup				X													
dsp-msg-call-identifier				X													
dsp-msg-date-time				X													
dsp-msg-lwc				X													
dsp-msg-mct				X													

Continued on next page

Table 3-3. Command Permissions Form Entries — Administer Features — *Continued*

Object	Action																
	Add	Backup	Busyout	Change	Clear	Copy	Disable	Display	Duplicate	Enable	Erase	List	Release	Remove	Restore	Save	Set
dsp-msg-miscellaneous				X													
dsp-msg-property-mgmt				X													
dsp-msg-softkey-label				X													
dsp-msg-tod-routing				X													
enp-number-plan				X													
external -device-alarm	X			X										X			
feature-access-codes				X													
fiber-link[1]	X			X										X			
hunt-group	X			X										X			
intercom-group	X			X										X			
intra-switch-cdr	X			X													
isdn cpn-prefix				X													
isdn-network-facilities				X													
isdn-tsc-gateway				X													
isdn-private-numbering				X													
isdn-public-unknown-nmbr																	
ixc-codes				X													
listed-directory-numbers				X													
login-ids	X			X													
mct-group-extensions				X													
meas-occ-busiest-intrvl				X													
meas-selection coverage				X													
meas-selection principal				X													
measurements security-violations					X												
mis			X										X				
multi-frequency signaling				X													
music-source				X													
node-routing				X													
paging code-calling-ids				X													

Continued on next page

Table 3-3. Command Permissions Form Entries — Administer Features — *Continued*

Object	Action																
	Add	Backup	Busyout	Change	Clear	Copy	Disable	Display	Duplicate	Enable	Erase	List	Release	Remove	Restore	Save	Set
paging-loudspeaker				X													
pgate	X			X										X			
pickup-group	X			X										X			
remote-access							X			X							
remote-call-coverage								X									
second-digit	X			X										X			
signaling-group	X			X										X			
sit-treatment				X													
site-data				X													
synchronization				X													
system-cdr				x													
system-parameters country-options				X													
system-parameters features				X													
system-parameters hospitality				X													
system-parameters security				X													
tenant				X													
term-ext-group	X			X										X			
test-schedule	X			X										X			
time																	X
translations																X	
udp				X													

1 MIPS only.

Table 3-4. Command Permissions Form Entries — Administer Permissions

Object	Action				
	Add	Change	Display	Enable	Remove
login	X	X	X	X	X
permissions		X			

Table 3-5. Command Permissions Form Entries — Administer Stations

Object	Action			
	Add	Change	Duplicate	Remove
abbreviated-dialing 7103A-buttons	X	X		X
abbreviated-dialing enhanced	X	X		X
abbreviated-dialing group	X	X		X
abbreviated-dialing personal		X		X
abbreviated-dialing system	X	X		X
alias-station		X		
attendant	X	X		X
console-parameters				
data-module	X	X	X	X
routing-table	X	X		X
station	X	X	X	X
terminal-parameters 603/302B1		X		
terminal-parameters 8400		X		
vdn	X	X		X
vector		X		

Table 3-6. Command Permissions Form Entries — Administer Trunks

Object	Action				
	Add	Change	Display	Duplicate	Remove
aar analysis		X			
aar digit-conversion		X			
access-endpoint	X	X		X	X
announcements		X			
ars analysis		X			
ars digit-conversion		X			
ars toll		X			
digit-absorption		X			
meas-selection route-pattern		X			
meas-selection trunk-group		X			
meas-selection wideband-trunk-grp		X			
modem-pool	X	X			X
personal-CO-line	X	X			X
pri-endpoint	X	X		X	X
remote-access		X	X		
rhnpa		X			
route-pattern		X			
time-of-day		X			
toll		X			
trunk-group	X	X			X

Testing a Login

1. Enter your login name at the login prompt.

```
Login: telmgr

Password:
```

Screen 3-8. Login Prompt Form

After the user enters the correct login name and password and the login is administered correctly, the system displays the command line interface.

To log into the system, do the following:

1. Turn on the administration terminal. Verify that the screen displays: `login:`
2. Enter your login name, then press RETURN. Verify that the screen displays: `password:`
3. Enter your password, then press RETURN.

   For security reasons, the password is not displayed as you type it. The system verifies that a valid login and password name were entered. If an invalid login or password name was entered, the screen displays:

   `login incorrect:`, and you must repeat the procedure.

   If the system recognizes the login and password name, verify that the screen displays the software version. The software version in the sample display below is *only an example*. *Software Version: G1V5.0.b4.0*

   NOTE:
   The software version is displayed in G3iV1.1-286 and G3iV2-386 only.

   Terminal Type (Enter 513, 715, VT220, 4410, or 4425): [513]

4. For your terminal type, complete one of the following:
   a. If the terminal is a 513 BCT, press RETURN. The 513 in brackets [513] is the system default terminal.
   b. If the terminal is a 4410 Data Terminal, enter 4410 and press RETURN.
   c. If the terminal is a 4425 Data Terminal, enter 4425 and press RETURN.
   d. If the terminal is a 610 BCT or a 615 MT that has a 513 emulation cartridge, press RETURN.

e. If the terminal is a 610 BCT or a 615 MT that does not have a 513 emulation cartridge, enter 4410 and press RETURN.

You may suppress INADS alarm origination whenever you log in as ”system technician.” After you supply the terminal type information requested, the system displays the following if Alarm Origination is currently activated per the Maintenance-Related System Parameters Form:

`Suppress Alarm Origination: [y]`

The default answer is ”yes.” If you do NOT wish to suppress alarm origination, you must enter either ”n” or ”no.” If you press any other key or combination of keys, the system interprets your answer as ”yes.”

NOTE:
The **test inads-link** command works regardless of whether you have overridden INADS alarm origination.

5. Verify that the screen displays: `enter command:`

   You may enter the desired command, such as **display station xxxx** or press HELP to obtain the list of permissible commands. (Refer to Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a detailed description of the commands available for system maintenance.)

Command Line Details

After a successful login, the administration terminal displays `enter command:` and waits for entry of a command.

A command is made up of multiple words that are typed on the keyboard and that instruct the system to perform a particular task. The system’s command structure follows the format: Action, Object, and Qualifier.

The first word entered is the *Action*. It specifies the operation to be done (for example, test, display, or reset).

The second word entered is the *Object*. It specifies the object to receive the action (for example, station, trunk group, or hunt group).

The third word(s) entered is/are the *Qualifier*. The Qualifier is one or more words or digits used to further identify or complete the Object. Depending on the Object used, a Qualifier may or may not be used.

An example of a command line used to do a short test twice on a station with the extension number 1212 is: *test station 1212 short r 2*.

In the preceding example, *test* is the Action, *station* is the Object, and *1212 short r 2* is the Qualifier.

Spaces separate the Action, Object, and Qualifier on the command line.

> **NOTE:**
> Command line words do not have to be completely spelled out. All that is required is to type enough letters to make the word unique.

Screen Forms

After the user completes a command line (see Note), the terminal displays the appropriate screen form(s). Screen forms are system-generated forms that are formatted to allow easy entry of translation data.

Screen forms enable the user to change the translations of the system by typing parameters on the keyboard. Screen forms also allow system technician to display errors and alarms.

Each screen form consists of a title, page number, body area, and a help and error message line. Specific screen forms exist for each type of administrable function.

DEFINITY Communications System Generic 3 Implementation, 555-230-653, contains detailed information and examples of the screen forms generated by the system.

Switch-Based Bulletin Board

This feature will allow a SAT user to leave messages in the system in order to communicate with other system users.

> **NOTE:**
> This feature is not intended as a substitute for the existing procedures for escalating problems, but only as an aid to the existing process.

Description

The bulletin board service provides an easy interface for the customer and Lucent Technologies to leave messages on the system.

The bulletin board feature will make it very easy for the customer to communicate with Lucent Technologies (and vise-versa). For example, when a new load is installed on a switch in the customer's system, Lucent Technologies will be able to leave the customer messages which describe new functionality. This feature will also allow Lucent Technologies to keep the customer informed on the progress of trouble items. In addition, the feature can be used by the customer to provide additional information concerning problems that have already been escalated by the normal procedure.

Accessing the Bulletin Board

Any user with the appropriate permissions can log into the system and have access to the bulletin board. User's who have "Maintain System" or "Administer Features" permissions can enter, change, display, print, or schedule to print a message. Users who have "Display Admen" and "Maintain Data" permission can display the bulletin board. Any user who has "Display" permission can display, print, and schedule to print the contents of the bulletin board.

When logging onto the system, users will be notified of any messages on the bulletin board. The notification message will indicate the last time the bulletin board was updated, if any "High-Priority" message exists, and if the bulletin board is 80% or more full. If a "High-Priority" message exists, the command prompt will change to the following message:

- `High-Priority Bulletin Board Messages Entered:`

After the next command is entered, the default command prompt will return to the screen.

User Considerations

- Only one user at a time may edit a message on the bulletin board.
- The user must have the proper permissions to access the bulletin board.
- The user must maintain the information stored on the bulletin board. It is the user's responsibility to delete old messages. If the bulletin board is full, any new messages overwrite old messages.

System Considerations

- The switch software must be G3V3/G3V4.
- The Bulletin Board feature provides up to 3 pages of text for each message. Each page is limited to 20 lines of text, and each line of text is limited to 40 characters per line. The first 10 lines of text on page 1 is reserved for Lucent Technologies Service's High-Priority messages.

System Bulletin Board Commands

The system commands "**change bulletin board**," "**display bulletin board**," and existing commands in the user interface are provided for use in the Switch Based Bulletin Board.

Editing a Bulletin Board Message

To edit or enter a message on the Switch Based Bulletin Board the user must:

1. Log into the system with “Maintain System or Administer Features” Permissions.
2. Enter the command “**change bulletin-board**.”
3. Follow system prompts.

To display messages on the Switch Based Bulletin Board the user must:

1. Log into the system with “Maintain System”, “Display Admin”, or “Maint Data” permissions.
2. Enter the command “**display bulletin board**.”
3. Follow system prompts.

Editing a Switch-Based Bulletin Board Message

A message may contain up to three pages of information. Message lines 1 through 10 on page 1 are reserved for Lucent Technologies Services *High-Priority* messages (the “init” and “inads” logins can edit the first 10 lines on page one). Pages 2 and 3 will allow up to 20 lines of text, and each line of text may be up to 40 characters per line. Each line of text has an associated date field that is populated automatically by the system each time the line is modified.

The control keys used to edit existing feature forms must be used to edit a message in the Switch Based Bulletin Board. The following characters are allowed for use in the text field:

- Uppercase/Lowercase letters, spaces, numerals, and !@#$%^&*()_ -+=[]{};’”<>./?.

NOTE:
Tab characters are not allowed. The existing command line interface will cause the cursor to move to the next field if a Tab character is entered.

If a user changes any lines that cause two or more consecutive blank lines, then the bulletin board will be automatically reorganized (upon submittal). Two or more blank lines will be consolidated into a single blank line. If a blank line is at the top of a form, it will also be deleted. This function will help prevent holes in the bulletin board screens as old entries are deleted.

To save a message entered into the bulletin board text field, the user must execute the **save translation** command.

G3V3 software is required for the bulletin board feature. The bulletin board feature, as described in this document is available in G3V4. The G3V3/G3V4 feature on the systems-parameters customers-options form need not be enabled.

The following screen is an example of bulletin board messages between Lucent Technologies and a customer who is having trouble with trunk group translations:

```
display bulletin-board          Page 1 of 3

          Messages (* indicates high-priority)       Date

      * AT&T is in the process of                   02/02/95
      * investigating your trunk lockup problem.    02/02/95
      * The Bulletin Board will be updated as       02/02/95
      * information is found.                       02/02/95
      * We have identified the problem.             02/02/95
      * The trunk you added does not provide        02/02/95
      * disconnect supervision, however your trunk  02/02/95
      * group was administered as such.             02/02/95
      * Please call for details.                    02/02/95
      *
       We recently added a new trunk group (14)     02/03/95
       and have had trunk group members locking up. 02/03/95
       We see the error - Thanks for checking.      02/03/95
```

System Logoff Procedure

The system logoff procedure should be done any time the terminal is not being used. This assures that system translations are not accidentally corrupted. The **monitor system** command, when canceled, automatically causes a terminal user to be logged off and, thus, prevents unauthorized use of the terminal.

Use the following procedure to log off the system:

1. Verify that the screen displays: `enter command:`
2. Enter logoff and press RETURN. The screen displays: *login:*

If after either logging on as system technician or issuing a system technician command no additional command is issued for 30 minutes, an automatic time-out and logoff occurs. At that time, any alarms in the system previously unreported to INADS are reported. If you are logged in at two separate administration terminals, the system waits until the second terminal times out or until you log off before reporting such alarms to INADS.

System Logoff Procedure G3V4

Logoff Notification (G3V4) will alert system administrators during log off from the system administration and maintenance interface of features that present a significant security risk are enabled. A message will be displayed on the system administration/maintenance interface during logoff if a security risk feature is enabled. Additionally, the user can be required to acknowledge the notification before the logoff is completed.

DEC VT220 Terminal

The G3iV3-386 system supports use of the DEC VT220 as a Manager I terminal. The VT220 is connected to the system and used in the same way as the other Manager I terminals. When logging in, at the terminal-type prompt the user should enter "VT220" to initialize the correct parameters. Keyboard definitions shown in Table 3-7 are in effect:

Table 3-7. Keyboard Definitions for the DEC VT220 Terminal

FUNCTION	VT220 KEY	ESCAPE SEQUENCE
Help	Help	ESC[28~
Previous Page	Previous Screen	ESC[5~
Next Page	Next Screen	ESC[6~
Cancel	Remove	ESC[3~
Execute	Do	ESC[29~
Previous Field	F17	ESC[31~
Next Field	F18	ESC[32~
Clear Field	F19	ESC[33~
Refresh	F20	ESC[34~
Next Form	Select	ESC[4~
Up Arrow	Up_Arrow	ESC[A
Down Arrow	Down_Arrow	ESC[B
Right Arrow	Right_Arrow	ESC[C
Left Arrow	Left_Arrow	ESC[D
Update Form	Find	ESC[1~

Initialization and Recovery

4

General

When the system is powered up, or when it experiences a catastrophic fault that interrupts its basic functions, the system undergoes a reboot. Besides "reboot," there are several less severe resets available to the system that allows it to recover from disrupting errors. The user can initiate these resets by using the reset system commands. These commands are used to manually restart the system at various levels, depending on the required test activity. The reset system commands are discussed in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

A system is reset due to a loss of power, or via one of the following:

- Reset commands at the administration terminal.
- Maintenance software, from which the system can reset itself. (This process starts when certain software and hardware errors are detected by the software.)
- "Interchange," which is a type of reset that can be scheduled as part of daily maintenance in High or Critical Reliability systems.

WARNING:
When the system is rebooted or reset at level 2, 3, 4, or 5, all voice terminal and attendant console features are adversely affected. Users should be advised of services that are lost and that, as a result, must be reactivated. The affected services are described in the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures".

The administration terminal display and circuit pack LEDs indicate the progress of the recovery process. LEDs are discussed in Chapter 7, ''LED Interpretation''.

The sections that follow discuss successful system resets. For each level of reset, a typical administration terminal display is provided. Note that any hexadecimal numbers that are shown in parentheses, such as "(=8B89)," are only examples and are subject to change. Susbsequent sections discuss the recovery process following an SPE-Down Mode and for "duplication interface-processing element communication down."

NOTE:
If any of the diagnostic tests fail, the system may or may not function properly, and the LMM may or may not proceed with the restart. If the LMM does not proceed with the restart, the system goes into SPE-Down Mode. In failure cases, the appropriate part (for example, the Processor circuit pack, the Memory circuit pack, or the Tape Unit, etc.) should be replaced.

NOTE:
Use and check the results of the **set/get vector** command found in the ''Set Commands'' section in Chapter 10, ''Maintenance Commands and Trouble-Clearing Aids'', "Maintenance Commands and Trouble-Clearing Aids" to determine how much time should be added for the recovery levels. Also, if an update file is applied on a system reset, add from 30 seconds to one minute to the recovery time for that reset.

Reset System 1 (System Warm Start)

This recovery takes about 30 seconds. All stable phone calls remain up. In-progress calls are dropped. No new calls can be made during this time.

In this restart, all software (Oryx/Pecos, drivers, maintenance, etc.) is reset.

Typical Display

```
RESET 1 (WARM) PERFORMED
```

Reset System 2 (System Cold Start Without Translations Loading)

All Port circuit packs are reset. All phone sessions are dropped. Phones begin to be reconnected to the switch within 30 seconds. In a large system, reconnection of all phones may take up to five minutes.

In this restart, all software (Oryx/Pecos, drivers, maintenance, etc.) is reset. In addition, the TDM Bus and all port circuit packs are reset. Typical displays in a 286 system, in a 386 system, and in a Release 5vs/si system follow:

Typical Display [286 systems]

ROM CHECKSUM TEST (= 8B89)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
RESET 2 (Cold_2) PERFORMED	

Typical Display [386 systems]

TN786 FLMM	
ROM CHECKSUM TEST (= 22C4)	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
RESET 2 (COLD_2) PERFORMED	

Typical Display [Release 5vs/si and later systems]

INTERNAL REGISTER TEST	PASSED
LOCAL BUS TEST	PASSED
ROM CHECKSUM TEST	PASSED
CONTROL STATUS TEST	PASSED
DCACHE TEST	PASSED
ICACHE TEST	PASSED
WRITE BUFFER TEST	PASSED
BTO TEST	PASSED
TIMER TEST	PASSED
RESET 2 (COLD_2) PERFORMED	

Reset System 3 (System Cold Start With Translations Loading)

Emergency Transfer is invoked. Translations are reloaded from tape in a 286 system or from a memory card in a 386 system. Depending on the translations, the reloading process could take from 30 seconds to five minutes in a 286 system from five seconds to 30 seconds in a 386 system. Thereafter, regardless of the system involved, all port circuit packs are reset, and all phone sessions are dropped. Phones begin to be reconnected to the switch within 30 seconds. In a large system, reconnection of all phones may take up to five minutes.

In this restart, all software (Oryx/Pecos, drivers, maintenance, etc.) is reset. After the software is reset, all translations are loaded from tape. In addition, the TDM Bus and all port circuit packs are reset. Typical displays in a 286 system in a 386 system and in a Release 5 vs/si system, follow:

Typical Display [286 system])

LMM VERSION 07.0.0	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= 8B89)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
RESET 3 (Cold_1) PERFORMED	

Typical Display [386 system]

TN786 FLMM	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= 22C4)	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
RESET 3 (COLD_1) PERFORMED	

Typical Display [TN790 Release 5vs/si and later systems]

INTERNAL REGISTER TEST	PASSED
LOCAL BUS TEST	PASSED
ROM CHECKSUM TEST	PASSED
CONTROL STATUS TEST	PASSED
DCACHE TEST	PASSED
ICACHE TEST	PASSED
WRITE BUFFER TEST	PASSED
BTO TEST	PASSED
TIMER TEST	PASSED
RESET 3 (COLD_1) PERFORMED	

Reset System 4 (System Reboot)

Emergency Transfer is invoked. In G1 and G3i 286, the LMM performs a series of diagnostics on the processor memory and on the tape. This takes less than two minutes. Then, the boot image is loaded from the tape. This takes less than four minutes. Translations are reloaded from the tape. Depending on the translations, the reloading process takes from 30 seconds to five minutes.

In a 386 system, however, the boot image is already in the flash ROM memory. The system is rebooted immediately after the LMM performs a series of diagnostics on the processor and memory. Translations are reloaded from the memory card. Depending on the translation, the reloading process takes from five to 30 seconds.

Thereafter, regardless of the system involved, all port circuit packs are reset, and all phone sessions are dropped. Phones begin to be reconnected to the switch within 30 seconds. In a large system, reconnection of all phones may take up to five minutes. Typical displays in a 286 system, in a 386 system and in a Release 5 system, follow:

Typical Display [G3iV1.1-286]

LMM VERSION 7.1.7	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY BOARD 2 DATA BIT TEST	PASSED
MEMORY BOARD 2 CHECK BIT TEST	PASSED
MEMORY BOARD 2 MEE SING TEST	PASSED
MEMORY BOARD 2 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
TAPE DIAGNOSTIC	PASSED
READING TAPE IMAGE	PASSED
RAM CHECKSUM TEXT (= 0B48)	PASSED
RAM CHECKSUM DATA (= 5D69)	PASSED
RESET 4 (REBOOT) PERFORMED	

Typical Display [G1]

LMM VERSION 7.1.7	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
TAPE DIAGNOSTIC	PASSED
READING TAPE IMAGE	PASSED
RAM CHECKSUM TEXT (= 0B48)	PASSED
RAM CHECKSUM DATA (= 5D69)	PASSED
RESET 4 (REBOOT) PERFORMED	

Typical Display [386 system]

TN786 FLMM	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= 22C4)	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 PARITY BIT TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
FLASH TEXT CHECKSUM (= BB04)	PASSED
RESET 4 (REBOOT) PERFORMED	

Typical Display [TN790 Release 5vs/si and later systems]

INTERNAL REGISTER TEST	PASSED
LOCAL BUS TEST	PASSED
ROM CHECKSUM TEST	PASSED
CONTROL STATUS TEST	PASSED
DCACHE TEST	PASSED
ICACHE TEST	PASSED
WRITE BUFFER TEST	PASSED
BTO TEST	PASSED
MEM CONFIG TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
MEMORY MODULE A STUCK BIT TEST	PASSED
MEMORY MODULE A PARITY TEST	PASSED
MEMORY MODULE A BURST TEST	PASSED
MEMORY MODULE B STUCK BIT TEST	PASSED
MEMORY MODULE B PARITY TEST	PASSED
MEMORY MODULE B BURST TEST	PASSED
MEMORY MODULE C STUCK BIT TEST	PASSED
MEMORY MODULE C PARITY TEST	PASSED
MEMORY MODULE C BURST TEST	PASSED
VIRTUAL MEMORY TEST	PASSED
EXECEPTION TEST	PASSED
TIMER TEST	PASSED
MTP TEST	PASSED
SANITY TIMER TEST	PASSED
ADDRESS MATCHER TEST	PASSED
FLASH TEXT CHECKSUM TEST	PASSED
DECOMPRESSING IDATA	in_cnt = 455532, out_cnt = 1802240
RAM DATA CHECKSUM TEST	PASSED
RESET 4 (EXT REBOOT) PEFORMED	

Reset System 5 (System Reboot and Run All 24-Hour Tests)

Emergency Transfer is invoked. The LMM performs a series of diagnostics on the processor, on memory, and on the tape [286 system] or memory card [386 system]. (Some of the diagnostics are performed twice.) This takes less than three minutes.

Then, in a 286 system, the boot image is loaded from tape. This takes less than four minutes. Translations are reloaded from the tape. Depending on the translations, the reloading process takes from 30 seconds to five minutes.

In a 386 system, however, the boot image is already in the flash ROM memory. The system is rebooted immediately after the LMM performs a series of diagnostics on the processor and memory. Translations are reloaded from the memory card. Depending on the translation, the reloading process takes from five to 30 seconds. Thereafter, regardless of the system involved, all port circuit packs are reset, and all phone sessions are dropped. Phones begin to be reconnected to the switch within 30 seconds. In a large system, reconnection of all phones may take up to five minutes. Finally, scheduled maintenance is initiated.

Typical displays in a 286 system in a 386 system and in a Release 5vs/si system, follow:

Typical Display [G3iV1.1-286]

LMM VERSION 7.1.7	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY BOARD 2 DATA BIT TEST	PASSED

Continued on next page

MEMORY BOARD 2 CHECK BIT TEST	PASSED
MEMORY BOARD 2 MEE SING TEST	PASSED
MEMORY BOARD 2 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY BOARD 2 DATA BIT TEST	PASSED
MEMORY BOARD 2 CHECK BIT TEST	PASSED
MEMORY BOARD 2 MEE SING TEST	PASSED
MEMORY BOARD 2 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
TAPE DIAGNOSTIC	PASSED
READING TAPE IMAGE	PASSED
RAM CHECKSUM TEXT (= 0B48)	PASSED
RAM CHECKSUM DATA (= 5D69)	PASSED
RESET 5 (EXTENDED REBOOT) PERFORMED	

Typical Display [G1]

LMM VERSION 7.1.7	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
ROM CHECKSUM TEST (= BD9F)	PASSED
DUAL PORT RAM TEST	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 DATA BIT TEST	PASSED
MEMORY BOARD 1 CHECK BIT TEST	PASSED
MEMORY BOARD 1 MEE SING TEST	PASSED
MEMORY BOARD 1 MEE DOUB TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
TAPE DIAGNOSTIC	PASSED
READING TAPE IMAGE	PASSED
RAM CHECKSUM TEXT (= 0B48)	PASSED
RAM CHECKSUM DATA (= 5D69)	PASSED
RESET 5 (EXTENDED REBOOT) PERFORMED	

Typical Display [386 system]

TN786 FLMM	
INVOKING EMERGENCY TRANSFER	
ROM CHECKSUM TEST (= 22C4)	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 PARITY BIT TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
ROM CHECKSUM TEST (= 22C4)	PASSED
SOFT INT TEST	PASSED
NMI TEST	PASSED
READ_WRITE MEMORY	PASSED
MEMORY BOARD 1 PARITY BIT TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
FLASH TEXT CHECKSUM (= BB04)	PASSED
RESET 5 (EXTENDED REBOOT) PERFORMED	

Typical Display [TN790 Release 5vs/si and later systems]

INTERNAL REGISTER TEST	PASSED
LOCAL BUS TEST	PASSED
ROM CHECKSUM TEST	PASSED
CONTROL STATUS TEST	PASSED
DCACHE TEST	PASSED
ICACHE TEST	PASSED
WRITE BUFFER TEST	PASSED
BTO TEST	PASSED
MEM CONFIG TEST	PASSED
MEMORY FUNCTIONAL TEST	PASSED
MEMORY MODULE A STUCK BIT TEST	PASSED
MEMORY MODULE A PARITY TEST	PASSED
MEMORY MODULE A BURST TEST	PASSED
MEMORY MODULE A COUPLE TEST	PASSED
MEMORY MODULE B STUCK BIT TEST	PASSED
MEMORY MODULE B PARITY TEST	PASSED
MEMORY MODULE B BURST TEST	PASSED
MEMORY MODULE B COUPLE TEST	PASSED
MEMORY MODULE C STUCK BIT TEST	PASSED
MEMORY MODULE C PARITY TEST	PASSED
MEMORY MODULE C BURST TEST	PASSED
MEMORY MODULE C COUPLE TEST	PASSED
VIRTUAL MEMORY TEST	PASSED
EXECEPTION TEST	PASSED
TIMER TEST	PASSED
MTP TEST	PASSED
SANITY TIMER TEST	PASSED
ADDRESS MATCHER TEST	PASSED
FLASH TEXT CHECKSUM TEST	PASSED
DECOMPRESSING IDATA	in_cnt = 455532, out_cnt = 1802240
RAM DATA CHECKSUM TEST	PASSED
RESET 5 (EXT REBOOT) PEFORMED	

Reset System Interchange (High or Critical Reliability Systems Only)

SPE-interchange (system hot start) is denoted by an "i" in the initcauses log. This restart is used to transfer control from the Active SPE to the Standby SPE in the least disruptive manner. Interchange (i) is the most transparent of all levels of restart and causes no disruption of service to telephone users. This restart takes fewer than two seconds.

NOTE:
The administration terminal is logged off. No diagnostics are performed, and only the login prompt is displayed.

An interchange (i) can be performed in one of the following three ways:

a. System Technician-Demanded: via **reset system interchange** command

b. Scheduled Maintenance

c. Software-Requested: The software requests the interchange when it determines that the Standby SPE is healthier than the current Active SPE

NOTE:
For most SPE alarms, interchange to the Standby SPE is achieved using the hot restart (i). However, there may be other alarms for which another restart level (1 through 4) must be used to achieve a transition to the Standby SPE. See Table 8-1, “Software-Requested Interchanges Caused by Alarm Conditions” in Chapter 8, "Reliability Systems: A Maintenance Aid", for a complete list of alarms and restart levels.

Procedure for SPE-Down Mode

Due to fatal hardware and software problems, it is possible for a system to go into SPE-Down Mode. In this mode, the system invokes emergency transfer and does not provide any other service. Moreover, while in this mode, the software does not (or cannot) run at all. In a High or Critical Reliability system the system goes into SPE-Down mode **only when both SPEs go into SPE-Down mode**.

There is an interface to the system via maintenance. The Processor circuit pack, is responsible for maintenance in a Standard Reliability system. In a High or Critical Reliability system, the maintenance is provided by the A-carrier Duplication Interface (DUPINT-A) TN772 circuit pack with help from the processor.

The administration terminal, which is connected directly to the processor in a Standard Reliability system and to DUPINT-A in a High or Critical Reliability system, provides a very limited interface to the system. Technicians can display alarms or restart the system. Only a subset of control complex alarms is displayed.

The following are sample displays for SPE-Down mode and the alarms displayed.

Display for SPE-Down in a Standard Reliability system:

**************SPE DOWN MODE*************
You can display alarms and reset system(4).
SPE_DOWN->

Screen 4-1 and Screen 4-2 show all possible SPE-Down alarms in a Standard Reliability system and in a High or Critical Reliability system, respectively.

```
DISPLAY ALARMS:

     Physical   Logical   On       Alternate   Alarm       Date        Date
     Name       Name      Board?   Name        Type        Alarmed     Resolved

     ------     PROC_BD   y        -----       MAJOR       ------      ------
     ------     MEM_BD_0  y        -----       MAJOR       ------      ------
     ------     M_BUS     y        -----       MAJOR       ------      ------
     ------     MAINT*    y        -----       MAJOR       ------      ------
     ------     NETCON_BD y        -----       MAJOR       ------      ------
     ------     TAPE_UNIT ------   -----       MAJOR       ------      ------
     ------     NO_TAPE   ------   -----       MAJOR       ------      ------
```

Screen 4-1. Display Alarms Command

* The "MAINT" designation is used for PR-MAINT.

Display for SPE-Down in a High or Critical Reliability System:

**************SPE DOWN MODE************
You can display alarms [a|b] and reset system(4) [a|b].
SPE_DOWN->

Screen 4-2 shows only one SPE-Down alarm in a High or Critical Reliability system after entering the **display b** command:

```
DISPLAY ALARMS B:

    Physical   Logical   On        Alternate   Alarm       Date        Date
    Name       Name      Board?    Name        Type        Alarmed     Resolved

      ------    PROC_BD   y            -----    MAJOR       ------       ------
```

Screen 4-2. Display Alarms (one SPE-Down)

NOTE:
A Standard Reliability system tries to restart itself every 20 minutes. A High or Critical system tries to restart itself every ten minutes.

The first step is to determine the location of the problem. It is possible for two or more circuit packs to have failed. It is also possible for a fatal problem with one circuit pack to affect another circuit pack. This is especially true for the Processor and Memory circuit packs, where a failure in one affects the other. All three of the following methods should be employed to determine where the fatal fault lies.

1. Use **display alarms** command:

   Issuing the **display alarms [a | b]** command at the administration terminal shows where maintenance thinks the problem lies. The alarms are a good indication of why the system went down. They should be used with the following two methods.

2. Observe red LEDs:

   Observe the red LEDs on the circuit pack to determine where software or processor firmware (LMM) had a problem.

3. Use the **reset** command:

   In 286 system, issuing the **reset** command (Standard Reliability system) or the **reset [a | b]** command (High or Critical Reliability system) causes the system to attempt a **reset system 4**. Observe all the diagnostics on the screen, and note if the LMM has a problem with any of the diagnostics, as this information should give a good indication of where the problem lies.

The procedure to get a system out of SPE-Down mode follows.

NOTE:
This is important! If you cannot complete the first step or have problems with the maintenance interface, then the first step should be to replace the Processor circuit pack. In a High or Critical Reliability system the DUPINT-A circuit pack can also cause SPE-Down.

WARNING:
Powering down or reseating the Processor or Memory circuit packs in a G3i-286 system causes all memory to be lost (including the initcause log). Thus, it may then be difficult to determine the original cause of the problem. However, since the primary goal is to return the switch to service, this action is justifiable.

1. If the alarms indicate a tape failure, replace the tape or tape drive and go to Step 3. Otherwise, verify that there is a good tape in the tape drive. If a tape is not present or if either the tape or tape drive is defective, then restarting the system via the **reset** command causes the system to go down again.
2. In a High or Critical Reliability system, select a carrier to repair first.

   When it is possible to accurately determine the location of the problem, use the **display alarms [a | b]** command to display alarms for both SPEs and check the red LEDs on the processor complex circuit packs. Select the carrier where the red LEDs indicate the circuit pack alarmed. Bring up the system on that carrier and then refer to Standby SPE Maintenance documentation to repair the Standby SPE.

   In a Standard Reliability system or after a carrier is chosen in a High or Critical Reliability system, determine which circuit pack is defective by displaying alarms and observing the red LEDs (as discussed previously). Depending on the alarms, use the appropriate table on the following pages to replace the circuit packs indicated, one by one, in the order shown. Table 4-1 is for a 286 system, and Table 4-2 is for a 386 system.

Table 4-1. Order of Circuit Pack Replacement [286 system]

Alarm	Suggested Circuit Packs To Replace
PROC-BD	1) Processor
	2) Memory
	3) Network Control
MEM-BD-0	1) Memory 1
	2) Memory 2 (if present)
	3) Processor
MEM-BD-1	1) Memory 2
(G3iV1.1-286 only)	2) Memory 1
	3) Processor
MAINT[1]	1) Processor
M-BUS	2) Memory
NETCON-BD	1) Network Control
	2) Processor
TAPE-UNIT	1) Tape Cartridge
NO-TAPE	2) Tape Drive
	3) Processor

1 The "MAINT" designation is used for PR-MAINT.

Table 4-2. Order of Circuit Pack Replacement

Alarm	Suggested Circuit Packs To Replace
PROC_BD	1) Processor 2) Network Control
MEM_BUS	1) Processor 2) Network Control
PROC_MEM	1) Processor
OFFBD_MEM	1) Processor 2) Network Control
INVALID_ERR	1) Processor 2) Network Control
MAINT_BD	1) Processor 2) Network Control
NETCON_ABSENT	1) Network Control 2) Processor
NO_CARTRIDGE	1) Memory Card 2) Network Control 3) Processor

In G3iV1.1-286, restart the system via the **reset** command (Standard Reliability system) or via the **reset [a | b]** command for the standby proccesor (High or Critical Reliability system). Observe the diagnostics results on the administration terminal carefully. If a problem still exists, the diagnostics provide the best clue to determine what the next step should be.

Procedure for Duplication Interface — Processing Element Communication Down

In a High or Critical Reliability system, it is possible for both SPEs to stop communicating with the A-carrier TN772 Duplication Interface (DUPINT-A) circuit pack. Thus, the DUPINT-A, which is in charge of maintenance, prints the following message on the administration terminal:

```
Duplication Interface-Processing Element Communication down
```

The system may continue to function on one of the SPEs. However, the system is not able to provide any interface to the administration terminal.

If the system is still providing service, connect the administration terminal to the Active SPE (check the amber LED on the Processor circuit pack). Then, if software provides a login on the administration terminal, you can determine the problems via the **display alarms** command.

If the system is not providing service, there is a problem with the Processor circuit packs and/or DUPINT-A. Replace these circuit packs, one by one, until the system starts functioning normally.

Routine Maintenance Procedures

5

General

The following general purpose maintenance procedures may be used with other repair strategies to clear system-alarmed and user-reported troubles. The procedures are:

- INADS Alarm Origination—Activation/Deactivation
- Maintenance-Related System Parameters Form
- Handling Port Circuit Packs
- Handling Control Circuit Packs
- Performing a Memory Upgrade on a TN790 Processor
- Removing Power
- Restoring Power
- Troubleshooting Control Carrier Power Units
- System Backup
- Software Upgrade
- Preventive Maintenance Procedures
- System Features
- Troubleshooting Backplane Voltage Problems

Preventive maintenance strategies for air filters, tape head, and batteries are also provided in "Preventive Maintenance Procedures" in this chapter.

INADS Alarm Origination— Activation/Deactivation

Alarm origination suppression enables you to stop alarm origination while you work on the switch. If you elect to suppress alarm origination, the system still originates a cleared alarm message if the repair activity resolves all previously reported Major and Minor alarms.

Before performing any of the maintenance procedures, such as replacing a circuit pack or removing power, the alarm origination to Initialization and Administration System (INADS) should be deactivated. This action prevents INADS from receiving alarms caused by the maintenance activity.

NOTE:
No alarms are reported while the remote maintenance port (that is, INADS port on the Processor circuit pack) is in use. Thus, any alarms generated during a remote maintenance session are not reported until the session is terminated. Furthermore, if any alarms are retired before the maintenance session is complete, they are not reported at all.

The alarm origination should be reactivated when the maintenance activity has been completed.

You may activate/deactivate INADS alarm origination whenever you log in as "system technician." After you supply the terminal type information requested, the system displays the following if Alarm Origination is currently activated in the Maintenance-Related System Parameters Form:

Suppress Alarm Origination: [y]

The default answer is "yes." If you do NOT want to suppress alarm origination, enter either "n" or "no." If you press any other key or combination of keys, the system interprets your answer as a "yes."

If, after logging on as system technician, or after issuing a command, no additional system technician command is entered for 30 minutes, an automatic time-out and logoff occurs. At that time, any alarms in the system previously unreported to INADS are reported. If you are logged in as system technician at two separate administration terminals, the system waits until the second terminal times out or until you log off before reporting such alarms to INADS.

NOTE:
The **test inads-link** command works whether or not you have overridden INADS alarm origination.

Maintenance-Related System Parameters Form

See the **change system-parameters maintenance** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids"".

Handling Port Circuit Packs

WARNING:
Electrostatic discharge can destroy or severely damage integrated circuits or circuit packs. Always wear the electrostatic discharge (ESD) wrist grounding strap when handling circuit packs. In a multicarrier cabinet (MCC) system, a jack for the ESD strap is provided on the cabinet near the control carrier (see Figure 5-1). In a single-carrier cabinet (SCC) system, the jack for the ESD strap is located above the circuit packs (see Figure 5-2).

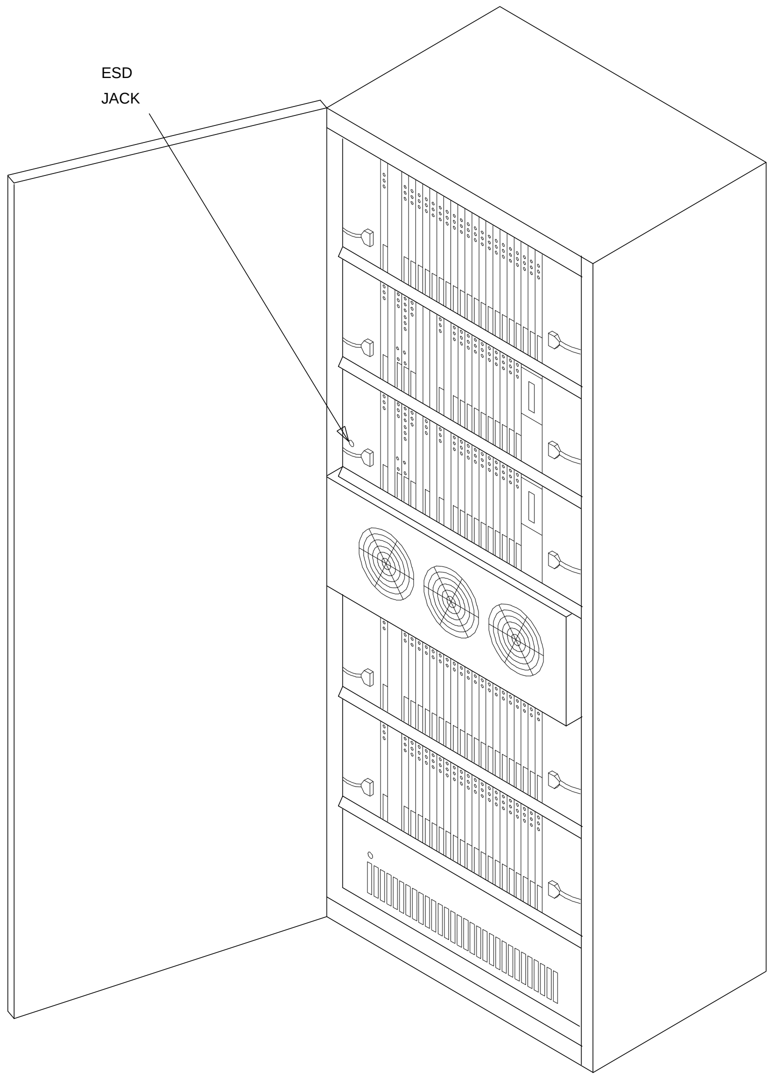


Figure 5-1. ESD Wrist Strap Grounding Locations on Carriers—Multicarrier Cabinet

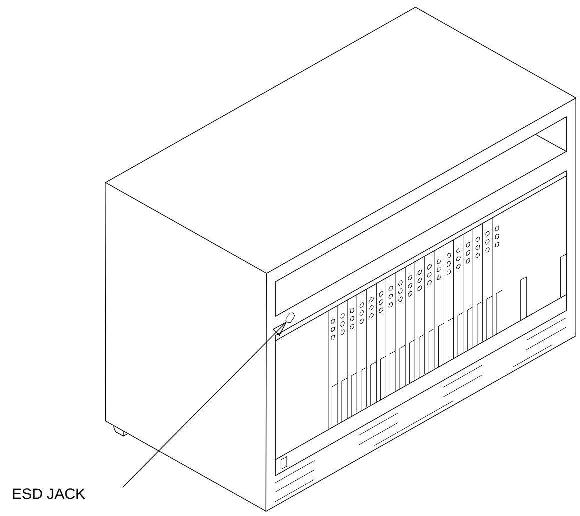


Figure 5-2. ESD Wrist Strap Grounding Locations on Carriers—Single Carrier Cabinet

The following procedures are for unseating, reseating, and replacing port circuit packs and are common to all maintenance activities that involve port circuit packs. The procedures are identical for both the PPN and EPN cabinets.

Common Port Circuit Packs

When any of the Common Port circuit packs (except the TN754 and TN754B Digital Line and TN758 Pooled Modem circuit packs) are physically removed from the backplane, no alarm is logged for about 11 minutes. For the Digital Line and Pooled Modem circuit packs, about 21 minutes elapse before an alarm is logged. When a circuit pack that has been removed is alarmed, the alarm type is Minor and is classified as an on-board alarm. The time delay permits maintenance activity to be performed without triggering an additional alarm. **An alarm is logged only against a Common Port circuit pack on which ports have been administered.**

NOTE:
In a heavily loaded system, the interval between the removal of a Common Port circuit pack and the logging of the alarm may be several minutes longer.

Reseating Port Circuit Packs

WARNING:
In general, it is NOT recommended that you reseat circuit packs unless the maintenance documentation specifically instructs you to do so. If the documentation does instruct you to unseat and reseat a port circuit pack, implement the following instructions for unseating and reseating port circuit packs.

CAUTION:
Any time a circuit pack is unseated, service is interrupted if the amber (busy) LED is lighted.

Each circuit pack has a latch pin and a locking lever on the lower part of its front panel (see Figure 5-3).

To unseat a circuit pack:

1. Slide the latch pin upward to unlock the locking lever.
2. Pull down on the locking lever until the pack is disconnected from its socket.
3. Pull the circuit pack just enough to break contact with the backplane connector, but do not remove it from the cabinet.

To reseat a circuit pack:

1. Push the unseated circuit pack back into the backplane connector.
2. Lift the locking lever until the pin engages.

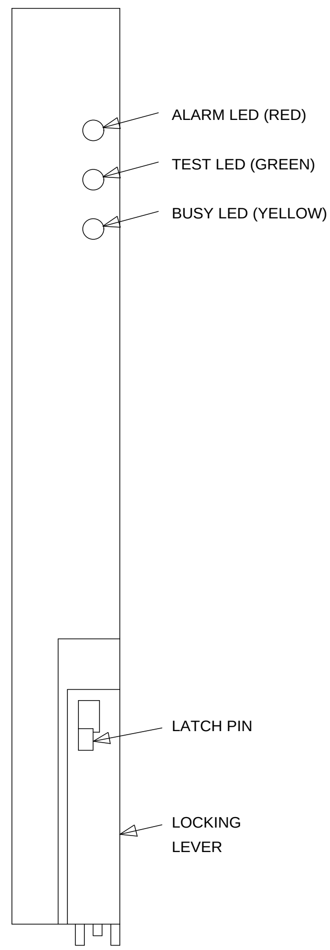


Figure 5-3. Typical TN-Coded Circuit Pack

Replacing Port Circuit Packs

Use the following procedures when replacing port circuit packs:

WARNING:
Replacing a port circuit pack temporarily clears any associated alarms; however, if the trouble still exists, the alarm(s) reappear(s).

1. Unseat the circuit pack.
2. Slide the circuit pack out of the slot.
3. Replace the circuit pack as per the following procedure:

   NOTE:
   If a new circuit pack does not correct the problem, install the original circuit pack.

To install a new circuit pack, or return the original one to service:

1. Carefully insert the circuit pack and push it all the way into its mounting slot.
2. Lift the locking lever until the latch pin engages.
3. Verify that the circuit pack LED indications are correct.

Handling Control Circuit Packs

PPN Control Circuit Packs

WARNING:
In general, it is NOT recommended that you reseat circuit packs unless the maintenance documentation specifically instructs you to do so. If the documentation does instruct you to unseat and reseat a circuit pack, then follow the instructions below which explain how to unseat, reseat, and replace circuit packs.

The procedures for unseating, reseating, and replacing control circuit packs vary depending on the system configuration. Therefore, before performing these maintenance activities, refer to the appropriate procedure below.

Procedure for a Multicarrier or Single Carrier Cabinet Without High or Critical Reliability

NOTE:
Each circuit pack has a latch pin and a locking lever on the lower part of its front panel (see Figure 5-3).

To unseat a Control circuit pack:

1. Remove power from the PPN using the appropriate procedure provided in the "Removing Power" section.
2. Slide the latch pin upward to unlock the locking lever.
3. Pull down on the locking lever until the circuit pack is disconnected from its socket.
4. Pull the circuit pack just enough to break contact with the backplane connector, but do not remove it from the cabinet.

To reseat a circuit pack:

1. Push the unseated circuit pack back into the backplane connector.
2. Lift the locking lever until the pin engages.
3. Restore power to the PPN using the appropriate procedure provided in the "Restoring Power" section.

To replace Control circuit packs:

1. Remove power from the PPN using the appropriate procedure in the "Removing Power" section.

1. Unseat the circuit pack.
2. Slide the circuit pack out of the slot.
3. Replace the circuit pack as per the following procedure:

   NOTE:
   If a new circuit pack does not correct the problem, install the original circuit pack.

NOTE:
If replacing a TN790 circuit pack refer to "TN790 Processor Circuit Pack (Memory)" in this chapter.

To install a new circuit pack or return the original one to service:

1. Carefully insert the circuit pack and push it all the way into its mounting slot.
2. Lift the locking lever until the latch pin engages.

3. Restore power to the PPN using the appropriate procedure in the "Restoring Power" section.
4. Verify that the circuit pack LED indications are correct.
5. Test the replaced control circuit pack(s) by issuing the appropriate system technician commands after power has been restored.

Network Control Circuit Pack

In a 286 system, the TN777 Network Control circuit pack is used. In a 386 system, the TN777B Network Control circuit pack is used.

Procedure for a 286 System

WARNING:
Whenever a TN777 Network Control circuit pack is reseated or replaced, the correct date and time setting must be manually entered and verified.

To reset the date and time, issue the **set time** command at the administration terminal. After *carefully* entering the desired information, issue the **display time** command to verify the accuracy of the date and time. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid", for specific procedures when handling circuit packs in the control (processor) complex of a High or Critical Reliability system.

Procedure for a Multicarrier] or Single Carrier Cabinet With High or Critical Reliability

Refer to the "Circuit Pack Replacement Procedure" section in Chapter 8, "Reliability Systems: A Maintenance Aid".

Procedure for a 386 System

WARNING:
Whenever a TN777B Network Control circuit pack is reseated or replaced, the correct date and time setting must be manually entered and verified.

The TN777B Network Control Pack holds a memory card. Before this circuit pack can be handled (that is, unseated, reseated, replaced, or installed), the memory card must be removed. Figure 5-4 and Figure 5-5 present two views of the TN777B Network Control circuit pack:

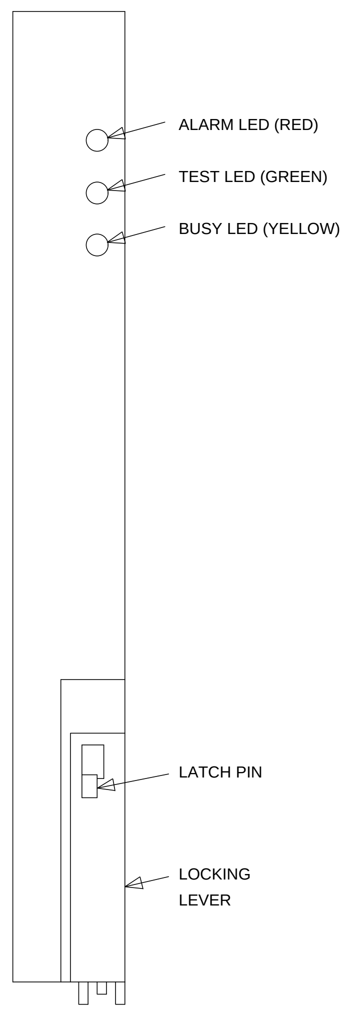


Figure 5-4. TN777B Network Control Circuit Pack (Front View)

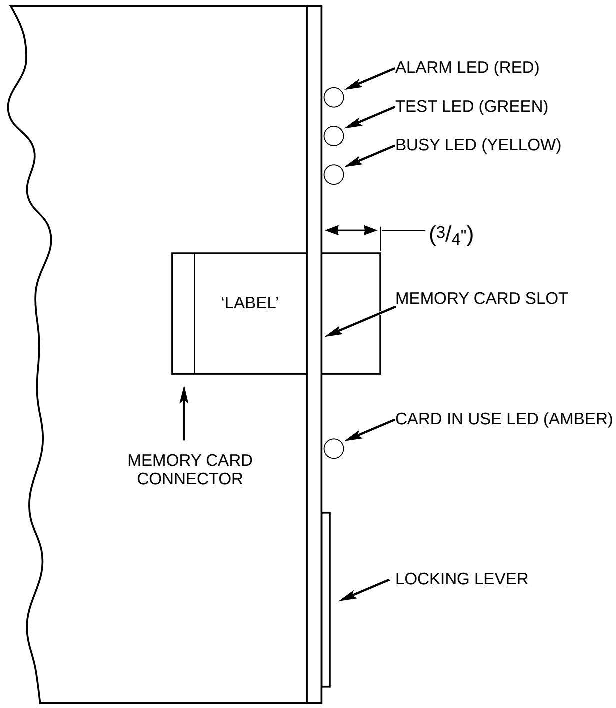


Figure 5-5. TN777B Network Control Circuit Pack (Side View)

To remove the memory card from the memory card slot in the TN777B circuit pack, do the following:

1. Check that the "card in use" LED is not lighted. Otherwise, removing the memory card may damage the data recorded on it.
2. Carefully pull the memory card from the memory card slot.

To insert the memory card into the memory card slot in the TN777B circuit pack, do the following:

1. Take the memory card and hold it in front of you so that the card's label is facing to your left.
2. With the memory card in this position, insert the shorter edge of the card into the mounting slot. Then, gently push the card forward until you feel some resistance at the opposite edge of the card. Once you feel this resistance, the memory card is inserted. About 3/4 of an inch of a fully inserted memory card should appear outside of the memory card slot.

WARNING:
Remember, assuming you are directly facing the circuit pack, the memory card label should be facing to your left. If this is not the case, remove the memory card according to the instructions provided previously in this section, and start again.

3. Test the inserted memory card by issuing the **test card-mem** system technician command (described in Chapter 8, "Reliability Systems: A Maintenance Aid").

EPN Control Circuit Packs

Control circuit packs (TN768, TN780, TN775, TN776, TN570 in the EPN) are unseated, reseated, replaced, and tested in the same way as Port circuit packs. **It is not necessary to remove power from the EPN [G1.2].** Refer to the "Handling Port Circuit Packs" section in this chapter. Note the special precautions required when handling the TN776 and TN570 Expansion Interface (EXP-INTF) circuit packs and the EPN TN768 and TN780 [G.2] Tone-Clock circuit packs.

EPN Expansion Interface Circuit Packs

If the system has High or Critical Reliability, verify that the Expansion Interface to be unseated or replaced is NOT a part of the Active Expansion Interface Link. Issue the **status system** command. If the Expansion Interface circuit pack is shown to be a part of the Active Expansion Interface Link, use the **set expansion-link PCSS** command to make the current Standby link the Active one.

EPN Tone-Clock Circuit Packs

If the EPN has redundant Tone-Clock circuit packs, make sure the Tone-Clock to be unseated or replaced is the Standby circuit pack. Issue the **status system** command. If the Tone-Clock is shown as Active, use the **set tone-clock PC** command to make the current Standby Tone-Clock the Active one.

TN790 Processor Circuit Pack (Memory)

The TN790 must have the same number of SIMMs as the replaced circuit pack.

CAUTION:
Be sure to use a Lucent Technologies-provided SIMM. Other brands may have incompatible edge connectors and could produce unpredictable results.

Install the SIMM on the TN790 Processor Circuit Pack

WARNING:
Before handling the circuit pack or the SIMM, put on a wrist strap and attach its plug or clip to the cabinet's frame.

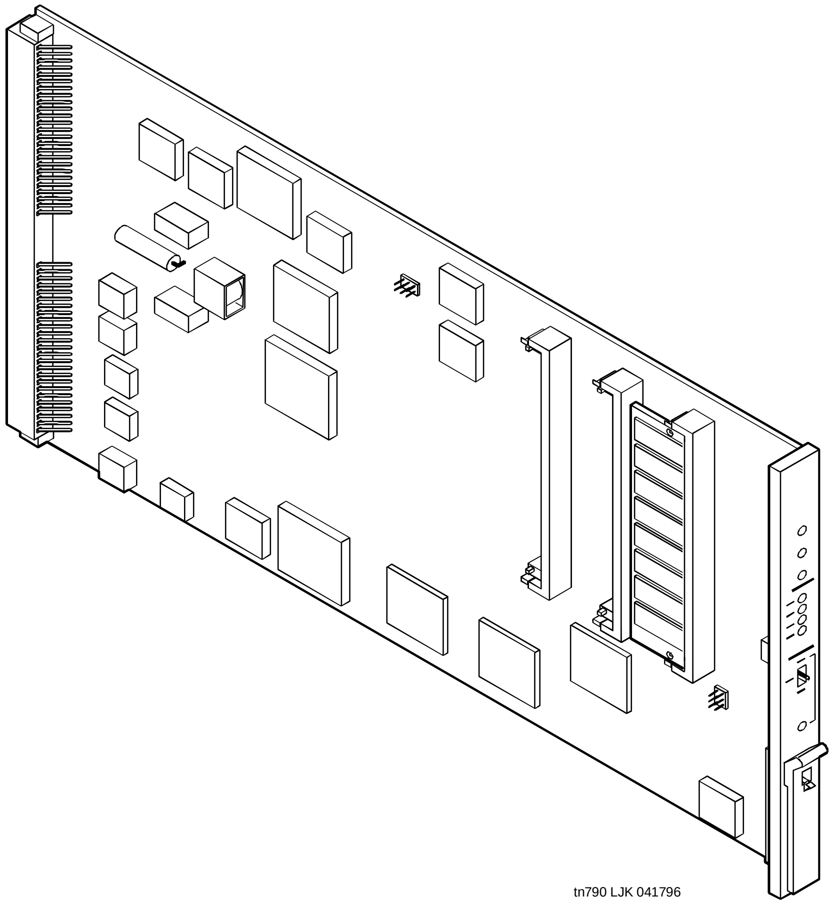


Figure 5-6. TN790 Processor Circuit Pack

Use the following procedure to install a SIMM:

1. Remove the TN790 Processor circuit pack from the control carrier.
2. Place the TN790 Processor circuit pack on an ESD-approved work station, such as the anti-static circuit pack packaging or anti-static mat.
3. Locate the Notch cutout area on one corner of the SIMM. See Figure 5-3. See WARNING.

WARNING:
Do not touch the SIMM's edge connector. Oils from your fingers can cause corrosion and/or oxidation to the contacts.

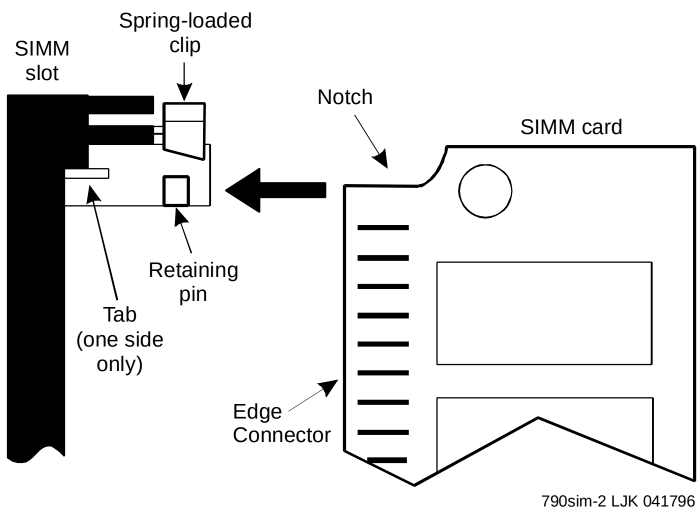


Figure 5-7. Align the SIMM with the SIMM Socket

4. Align the SIMM with the slot in the center of the SIMM socket.

   (See Figure 5-3).

   Hold the SIMM at a 45-degree angle, with the notch pointing towards the front face plate of the circuit pack. Align the SIMM's edge connector with the slot in the center of the SIMM socket. See WARNING.

   WARNING:
   Do not use force when inserting the SIMM into the SIMM socket. When the SIMM is installed correctly, it will snap easily into place.

5. Press the SIMM's edge connector firmly into the SIMM socket.

   Pivot the SIMM up and towards the circuit pack until it clicks into place (as shown in Figure 5-4).

   The metal tabs at each end of the socket snap into place around the SIMM and the small retaining pins snap into the holes at each end of the SIMM.

   If you have misaligned or only partially seated the SIMM, you will not hear a sharp click, and the retaining pins will not snap cleanly into the holes. You can easily remove the SIMM (see the next section, "Removing a SIMM,") and reinstall it.

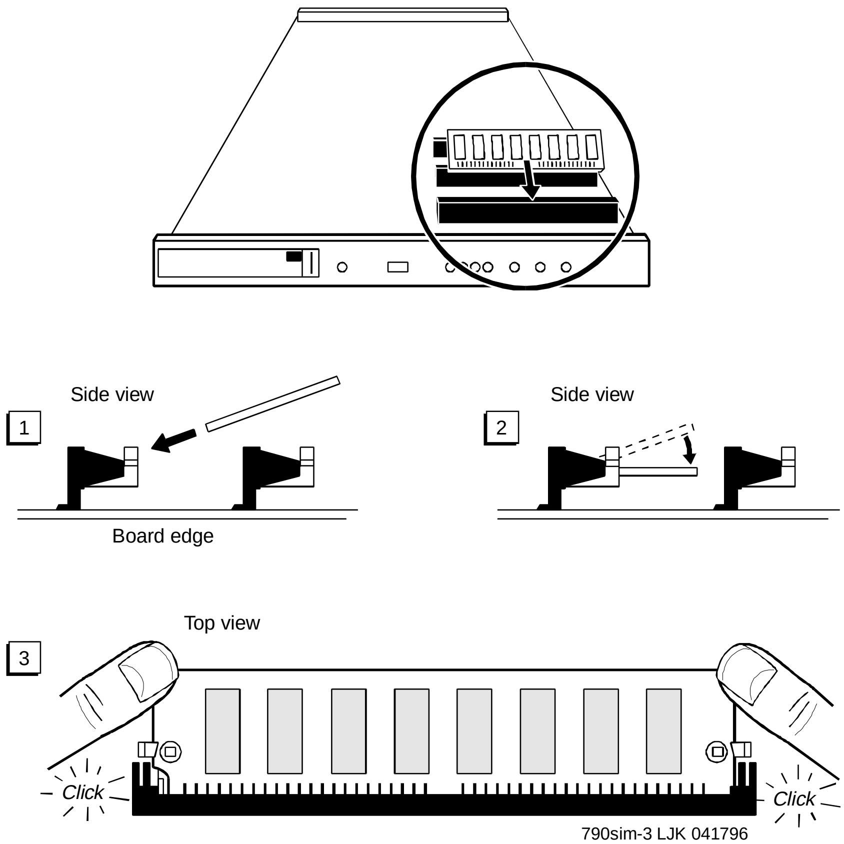


Figure 5-8. SIMM Insertion Procedure

Removing the SIMM from the TN790 Processor Circuit Pack

See WARNING.

> **WARNING:**
> *Before handling the circuit pack or the SIMM, put on a wrist strap and attach its plug or clip to the cabinet's frame.*

See Figure 5-2 to locate the SIMM sockets on the TN790 processor circuit pack.

Use the following procedure to remove a SIMM:

1. Place the TN790 Processor circuit pack on an ESD-approved work station, such as the circuit-pack packging or an anti-static mat.

2. Carefully press the spring-loaded clips, located at each end of the SIMM socket, away from the SIMM. The SIMM will reposition itself at an angle when both clips are released. See Figure 5-9.

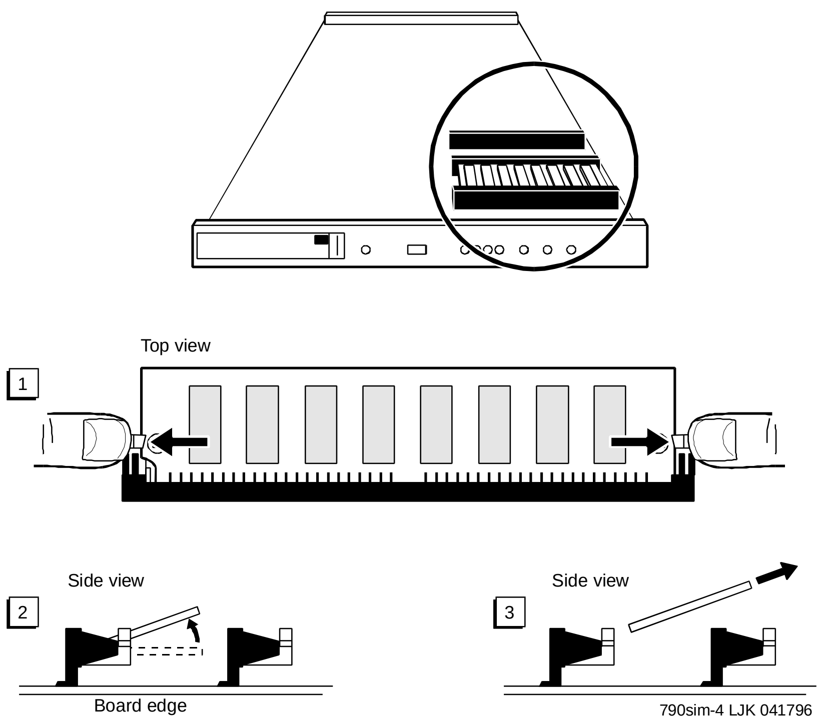


Figure 5-9. Removing a SIMM from its Socket

3. Remove the SIMM and place it in an ESD bag.

Removing Power

When power is removed, the following features, if activated, are deactivated:

- Attendant Trunk Group Control
- Automatic Callback
- Call Park
- Make Busy for Direct Department Calling (DDC) and Uniform Call Distribution (UCD)

The procedures for removing power vary depending on the system configuration. Therefore, before performing these maintenance activities, refer to the following appropriate procedure.

Procedure for a Multicarrier or Single Carrier Cabinet PPN

This procedure applies to a multicarrier or single carrier cabinet PPN with or without High or Critical Reliability, where the cabinet is powered by either an AC or a DC power source. For a G3sV2 or G3vsV2 system, this procedure applies to a single-carrier cabinet PPN, where the cabinet is powered by either an AC or a DC power source [G3sV2] or by an AC power source [G3vsV2].

NOTE:
286 Systems use Tape Storage, 386 Systems use memory card storage.

WARNING:
If a Tape Alarm is present, or if a tape problem is suspected, do not save translations on either of the two tapes provided with the system (current tape and backup tape). An attempt to save translations can destroy all data on the tape. Obtain a spare third tape or do not save translations.

WARNING:
If a memory card alarm is present, or if a memory card problem is suspected, do not save translations of the memory card that is provided with the system.

To remove power, do the following:

1. Check that the tape cartridge is in the tape drive. or check that the memory card is in the TN777B Network Control circuit pack.
2. At the administration terminal, enter the **save translations** command, unless a tape drive problem or a memory card problem is active.

3. In a standard reliability system on the Processor circuit pack in the PPN, and on the Maintenance circuit pack in the EPN, set the Emergency Transfer switch to "ON."

CAUTION:
When removing power, Error Log information is lost. If the data is to be retained, enter the ***reset system 4*** *command. This command restarts the system and may take several minutes. Wait for the login prompt before proceeding.*

4. To remove power from the cabinet or carrier (single carrier cabinet), proceed as follows:
   - In an AC-Powered multicarrier cabinet system, set the circuit breaker to OFF at the Power Distribution Unit (see Figure 5-4).
   - In a DC-Powered multicarrier cabinet system, turn off the DC Power supply.
   - In an AC-Powered single carrier cabinet system, turn off the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the WP-91153 Power Unit.
   - In a DC-Powered single carrier cabinet system, turn off the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the 676B Power Unit.

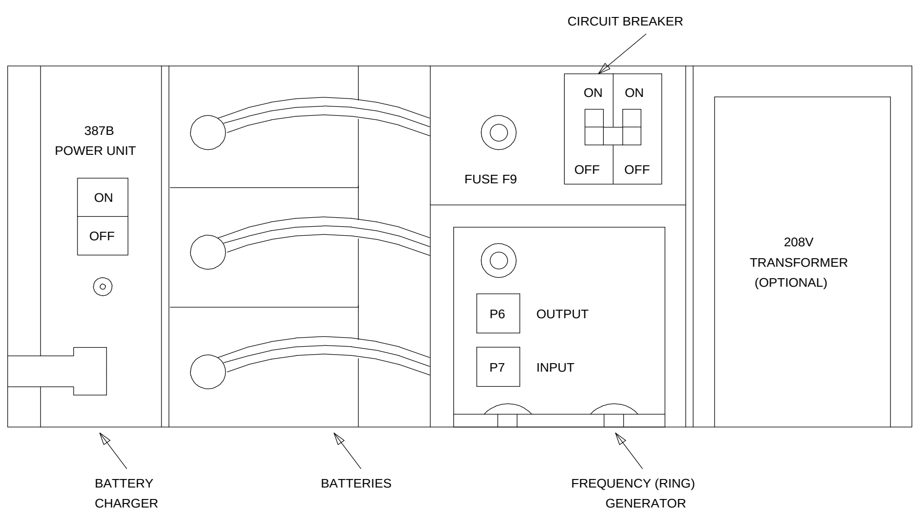


Figure 5-10. Power Distribution Unit

Procedure for a Multicarrier or Single Carrier Cabinet EPN

This procedure applies to a multicarrier cabinet EPN or a single carrier EPN with or without High or Critical Reliability, where the cabinet is powered by either an AC or a DC power source.

Power may be removed from the EPN without affecting the PPN.

NOTE:
In a High or Critical Reliability system, if power is to be removed from an individual carrier only, make sure that the affected carrier does not contain an Expansion Interface circuit pack that is part of the Active Expansion Link or an Active Tone-Clock. To determine which Expansion Interface Link and Tone-Clock are active, issue the **status system** command. To determine the synchronization reference, use the **display synchronization** command.

1. To remove power from the cabinet (multicarrier cabinet) or carrier (single-carrier cabinet), proceed as follows:
   - In an AC-Powered multicarrier cabinet system, set the circuit breaker to OFF at the Power Distribution Unit (see Figure 5-4).
   - In a DC-Powered multicarrier cabinet system, turn off the DC Power supply.
   - In an AC-Powered single-carrier cabinet system, turn off the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the WP-91153 Power Unit.
   - In a DC-Powered single-carrier cabinet system, turn off the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the 676B Power Unit.

Restoring Power

The procedures you need to restore power depend on the system configuration. Therefore, before performing these maintenance activities, refer to the following appropriate procedure.

Procedure for Multicarrier and Single Carrier Cabinet PPN

This procedure applies to both multicarrier and single-carrier cabinet PPNs with or without High or Critical Reliability, where the cabinet is powered by either an AC or DC power source. In G3sV2 or G3vsV2, this procedures applies to single-carrier PPNs that are powered by either an AC or DC power source [G3sV2] or by an AC power source [G3vsV2].

NOTE:
In a High or Critical Reliability system, if power is to be removed from an individual carrier only, make sure that the affected carrier does not contain an Expansion Interface circuit pack that is part of the Active Expansion Link or an Active Tone-Clock. To determine which Expansion Interface Link and Tone-Clock are active, issue the **status system** command. To determine the synchronization reference, use the **display synchronization** command.

1. Restore power as follows:

   NOTE:
   If the carrier is powered by a 676B Power Unit, the 676B must have been powered off for at least 10 seconds before being powered on. If not, the 676B Power Unit does not restart.

   - In an AC-Powered multicarrier cabinet system, set the circuit breaker to ON at the Power Distribution Unit (see Figure 5-4).
   - In a DC-Powered multicarrier cabinet syste, turn off the DC Power supply.
   - In an AC-Powered single carrier cabinet system, turn on the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the WP-91153 Power Unit.
   - In a DC-Powered single carrier cabinet system, turn on the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the 676B Power Unit.

2. If this system uses a memory card, make sure that the memory card is properly inserted into the slot.

3. The system now goes through the rebooting process. In a 286 system, the system program and the translations are loaded from the tape. The translations are loaded from the memory card, and rebooting requires about three minutes.
4. When system power is restored, the appropriate display is shown on the administration terminal.

   The display is the same as a **reset system 4** that is described in Chapter 4, "Reset System 4 (System Reboot)".
5. After the system reboot is finished and all trouble is cleared, return the EMER XFER (Emergency Transfer) switch(es) to AUTO. This restores the system to the normal operating mode.
6. Reset the time using the **set time** command. Use **display time** command to verify.

Procedure for Multicarrier and Single Carrier Cabinet EPN

Power may be restored to the EPN without affecting the PPN.

This procedure applies to both multicarrier and single-carrier cabinet EPNs with or without High or Critical Reliability, where the cabinet is powered by either an AC or DC power source.

NOTE:
In a High or Critical Reliability system, if power is to be removed from an individual carrier only, make sure that the affected carrier does not contain an Expansion Interface circuit pack that is part of the Active Expansion Link or an Active Tone-Clock. To determine which Expansion Interface Link and Tone-Clock are active, issue the **status system** command. To determine the synchronization reference, use the **display synchronization** command.

1. To restore power to the cabinet (multicarrier cabinet) or carrier (single-carrier cabinet), proceed as follows:

   NOTE:
   If the carrier is powered by a 676B Power Unit, the 676B must have been powered off for at least 10 seconds before being powered on. If not, the 676B Power Unit does not restart.

   - In an AC-Powered multicarrier cabinet system, set the circuit breaker to ON at the Power Distribution Unit (see Figure 5-4).
   - In a DC-Powered multicarrier cabinet system, turn on the DC Power supply.
   - In an AC-Powered single-carrier cabinet system, turn on the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the WP-91153 Power Unit.
   - In a DC-Powered single-carrier cabinet system, turn on the power in each carrier individually. The ON/OFF switch is located at the back of the carrier behind the 676B Power Unit.
2. The EPN circuit packs is inserted and the EPN is available for call processing.
3. After the system reboot is finished and all trouble is cleared, return the Emergency Transfer switch to AUTO. This restores the system to the normal operating mode.

Troubleshooting Control Carrier Power Units

For an AC- or DC-powered multicarrier cabinet system with or without High or Critical Reliability, the CARR-POW (Carrier Port Power Unit) MO represents the pair of power units that provide power for each carrier in a multicarrier cabinet system. If a problem is reported by hardware for a power unit in a port carrier, the system can recycle the pair of power units in the port carrier. However, if the problem is reported in a control carrier, the **recycle carrier PC** command can be used *only* for power units in the B carrier of the following configurations:

- Multicarrier Cabinet PPN
- Multicarrier Cabinet EPN with High or Critical Reliability
- Multicarrier Cabinet EPN

Therefore, special troubleshooting procedures have been provided for your use if a problem is suspected in one of the power units in an A carrier or the B carrier of a PPN in a High or Critical Reliability system when the "recycle" command should not be used. Recall that in a multicarrier cabinet (PPN or EPN), carrier A is the control carrier, and carriers B, C, D, and E are the port carriers. In a multicarrier cabinet system with High or Critical Reliability, carriers A and B are the control carriers and carriers C, D, and E are the port carriers. In a control carrier, if the LED on one of the power units is red and an alarm has been raised in the Alarm Log against the CARR-POW MO, the power units may be defective. If it is defective, it should be replaced. However, occasionally a red LED on a control carrier power unit may indicate a defective circuit pack (control or port) in that carrier, a defective backplane, or a transient problem of no significance rather than a defective power unit. Use the following appropriate procedure to troubleshoot control carrier power units in a multicarrier cabinet system with or without High or Critical Reliability.

Recall that in a multicarrier cabinet (PPN or EPN), carrier A is the control carrier, and carriers B, C, D, and E are the port carriers. In a multicarrier cabinet system with High or Critical Reliability, carriers A and B are the control carriers and carriers C, D, and E are the port carriers. In a control carrier, if the LED on one of the power units is red and an alarm has been raised in the Alarm Log against the CARR-POW MO, the power units may be defective. If it is defective, it should be replaced. However, occasionally a red LED on a control carrier power unit may indicate a defective circuit pack (control or port) in that carrier, a defective backplane, or a transient problem of no significance rather than a defective power unit. Use the following appropriate procedure to troubleshoot control carrier power units in a multicarrier cabinet system with or without High or Critical Reliability.

Procedure for a Multicarrier Cabinet Without High or Critical Reliability

WARNING:
If a Tape Alarm is present or a tape problem is suspected, do not save translations on either of the two tapes provided with the system (current tape and backup tape). An attempt to save translations could destroy all data on the tape. Obtain a spare third tape or do not save translations.

1. Check that the tape cartridge is in the Tape Transport.
2. At the administration terminal, enter the save translations command, unless a tape drive problem is active.
3. On both the Processor circuit pack in the PPN and on the Maintenance circuit pack in the EPN, set the EMER XFER (Emergency Transfer) switch to ON. This locks the system in the Transfer Mode until the trouble is cleared.

   WARNING:
   Electrostatic discharge can destroy or severely damage integrated circuits or circuit packs. Always wear the electrostatic discharge (ESD) wrist grounding strap when handling circuit packs. Connect the wrist strap to one of the metal tabs located on the lower left or right side of one of the carriers (see Figure 5-1 and Figure 5-2).

4. Unplug the power unit.
5. Move the locking slide on the suspect power unit to the extreme left position, and unlatch the locking lever.
6. Unseat the power unit.
7. Unseat all the control carrier circuit packs.
8. Reseat the power unit.
9. Plug in the power unit.
   a. If the red LED on the suspect power unit lights immediately, then the control circuit packs can be presumed to be healthy.
   b. If the red LED on the suspect power unit does **not** light immediately, continue with the next step.

10. Reseat the circuit packs one at a time while observing the LED on the power unit.
    a. If the red LED lights when a specific circuit pack is reseated, unseat and reseat the same circuit pack again to rule out a transient problem. If the red LED lights again, then the problem is with the circuit pack, and the power unit is functioning properly. Replace the defective circuit pack.
    b. If the red LED on the suspect power unit does **not** light during the reseating of the control circuit packs, continue with the next step.
11. Unseat all port circuit packs.
12. Reseat the port circuit packs one at a time following the same steps outlined above for control circuit packs.
13. If none of the control or port circuit packs appears to be defective, then the power unit is defective and should be replaced. Refer to the CARR-POW (Carrier Port Power Unit for AC-Powered or DC-Powered Systems) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", for instructions on replacing the various types of power units.
14. When the new power unit has been installed and the system reboot has completed, return the EMER XFER (Emergency Transfer) switch to AUTO. This restores the system to the normal operating mode.

Procedure for a Single-Carrier Cabinet Without High or Critical Reliability

The same procedure outlined in "Procedure for a Multicarrier Cabinet without High or Critical Reliability [G3iV1.1-286]" can be used with the exception of using information provided by the red LED on Multicarrier cabinets (Steps 9 and 10). Single-Carrier Cabinet power units have only a yellow LED. If the yellow LED is on, the power unit is operating as normal. If the LED is off, no external power is being supplied, or the power unit has a fault. So, for Steps 9 and 10, the yellow LED going off is the indicator of a problem with a circuit pack (given there is external power).

Procedure for a Single Carrier Cabinet

The following procedure is relevant only to a system that uses a memory card instead of tape.

1. Check that the memory card is in the TN777B circuit pack.
2. At the administration terminal, enter the **save translation** command, unless a a memory card problem is active.

3. On the Processor circuit pack in the PPN, set the EMER XFER (Emergency Transfer) switch to ON. This locks the system in the Transfer Mode until the trouble is cleared.

   WARNING:
   Electrostatic discharge can destroy or severely damage integrated circuits or circuit packs. Always wear the electrostatic discharge (ESD) wrist grounding strap when handling circuit packs. Connect the wrist strap to one of the metal tabs located on the lower left or right side of one of the carriers (see Figure 5-1 and Figure 5-2).

4. Unplug the power unit.
5. Move the locking slide on the suspect power unit to the extreme left position, and unlatch the locking lever.
6. Unseat the power unit.
7. Unseat all the control circuit packs.
8. Reseat the power unit.
9. Plug in the power unit.
   a. If the yellow LED on the suspect power unit lights immediately, the control circuit packs can be presumed to be healthy.
   b. If the yellow LED on the suspect power unit does **not** light immediately, continue with the next step.
10. Reseat the circuit packs one at a time while observing the LED on the power unit.
    a. If the yellow LED lights when a specific circuit pack is reseated, unseat and reseat the same circuit pack again to rule out a transient problem. If the yellow LED lights again, the problem is with the circuit pack, and the power unit is functioning properly. Replace the defective circuit pack.
    b. If the yellow LED on the suspect power unit does **not** light during the reseating of the control circuit packs, continue with the next step.
11. Unseat all port circuit packs.
12. Reseat the port circuit packs one at a time following the same steps outlined above for control circuit packs.
13. If none of the control or port circuit packs appears to be defective, the power unit is defective and should be replaced. Refer to the CARR-POW (Carrier Port Power Unit for AC-Powered or DC-Powered Systems) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", for instructions on replacing the various types of power units.

14. When the new power unit has been installed and the system reboot has completed, return the EMER XFER (Emergency Transfer) switch to AUTO. This restores the system to the normal operating mode.

Procedure for a Multicarrier Cabinet With High or Critical Reliability

CAUTION:
When any troubleshooting or maintenance activity is performed in a carrier housing a suspect power unit, the carrier must be in Standby mode.

1. By issuing the **status system** command at the administration terminal, determine the mode (Active or Standby) of the control carrier or housing the suspect power unit.

   If the carrier with the suspect power unit is the Active carrier, clear any alarms associated with the Standby carrier. For detailed instructions on processor complex repair procedures, refer to the "STBY-SPE (Standby SPE)" Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", and to the "Repair Procedures for High and Critical Reliability" section in Chapter 8, "Reliability Systems: A Maintenance Aid".

   Issue the **reset system interchange** command.

2. Reissue the **status system** command to verify that the control carrier containing the suspect power unit is still in Standby mode.

3. To override any attempt by the system software to make the Standby SPE the Active SPE, the SPE Select Switches on the Duplication Interface circuit packs must be moved as follows:

   a. If the suspect power unit is in control carrier A, move both SPE Select Switches to the SPE-B position (that is, to the right) one at a time.

   b. If the suspect power unit is in control carrier B, move both SPE Select Switches to the SPE-A position (that is, to the left) one at a time.

   WARNING:
   Electrostatic discharge can destroy or severely damage integrated circuits or circuit packs. Always wear the electrostatic discharge (ESD) wrist grounding strap when handling circuit packs. Connect the wrist strap to one of the metal tabs located on the lower left or right side of one of the carriers (see Figure 5-1 and Figure 5-2).

4. Unplug the suspect power unit.
5. Move the locking slide on the suspect power unit to the extreme left position and unlatch the locking lever.
6. Unseat the power unit.
7. Unseat all control carrier circuit packs.
8. Reseat the power unit.
9. Plug in the power unit.
   a. If the red LED on the suspect power unit lights immediately, then the control circuit packs can be presumed to be healthy.
   b. If the red LED on the suspect power unit does **not** light immediately, continue with the next step.
10. Reseat the control circuit packs, one at a time, while observing the LED on the power unit.
    a. If the red LED lights when a specific circuit pack is reseated, unseat and reseat the same pack again to rule out a transient problem. If the red LED lights again, then the problem is with the circuit pack, and the power unit is functioning properly. Replace the defective circuit pack.
    b. If the red LED on the suspect power unit does **not** light during the reseating of the control circuit packs, continue with the next step.
11. Unseat all port circuit packs.
12. Reseat the port circuit packs, one at a time, following the same steps outlined above for control circuit packs.
13. If none of the control or port circuit packs appear to be defective, then the power unit is defective and should be replaced. Refer to the CARR-POW (Carrier Port Power Unit for AC-Powered or DC-Powered Systems) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", for instructions on replacing the various types of power units.
14. Return the SPE switches to the AUTO position, one at a time.
15. If you wish to issue **test** commands on Standby SPE components, issue the **refresh** command. Then, perform all desired **test** commands.

    NOTE:
    It may be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command is issued five times without the Standby SPE becoming labeled "standby" on the status system form, escalate the problem.

16. After all desired **test** commands have been executed, issue the **test spe-standby long** command since the **refresh spe-standby** command preempted a Standby SPE maintenance activity.
17. If the **refresh spe-standby** command was used in the time frame in which scheduled maintenance with a translation save was to have been conducted, issue the save translation command to ensure that the current translation data has been written to both the Active and Standby tapes.

Procedure for a Single-Carrier Cabinet With High or Critical Reliability

The same procedure outlined in "Procedure for a Multicarrier Cabinet with High or Critical Reliability" can be used with the exception of using information provided by the red LED on Multicarrier cabinets (Steps 9 and 10). Single-Carrier Cabinet power units have only a yellow LED. If the yellow LED is on, the power unit is operating as normal. If the LED is off, no external power is being supplied, or the power unit has a fault. So, for Steps 9 and 10, the yellow LED going off is the indicator of a problem with a circuit pack (given there is external power).

Replacing Components Within the G3vs or Release 5vs or later

Components within the G3vs unit can be replaced while the unit is attached to the wall. Also, if the wires and cables at the back of the cabinet that connect the unit to the wall are neatly bundled, these wires and cables need not be disconnected as a prelude to replacing components.

Figure 5-11 and Figure 5-12 that follow provide views of the power supply sub-assembly. Figure 5-13 provides a view of the fan sub-assembly. The sections following the figures discuss how to disassemble the G3vs unit and then replace the power supply or fans within the unit.

CAUTION:
Whenever you are replacing either the power supply or the fans within a G3vs unit in cases where the unit is already attached to the wall, you should disconnect the entire fan panel from the unit. Otherwise, if the fan panel is left to dangle, the cable assemblies leading out from the fans (which are connected to the fan panel) and into the backplane might become damaged or disconnected from the backplane.

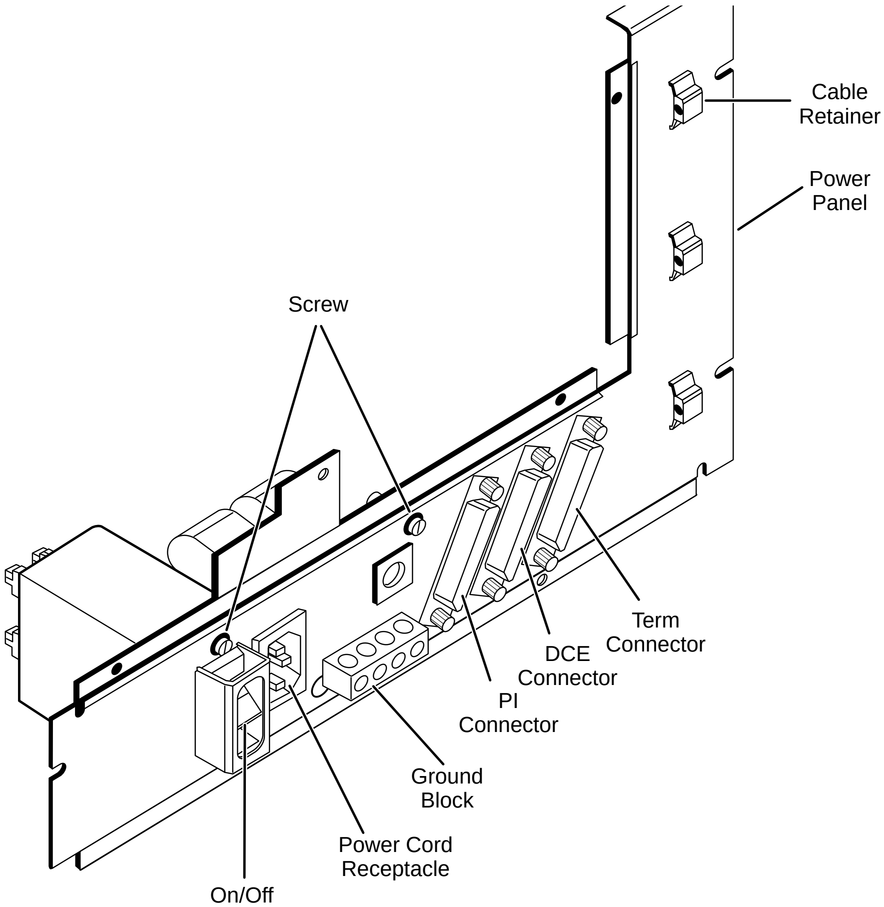


Figure 5-11. Power Supply Sub-Assembly (Outside View)

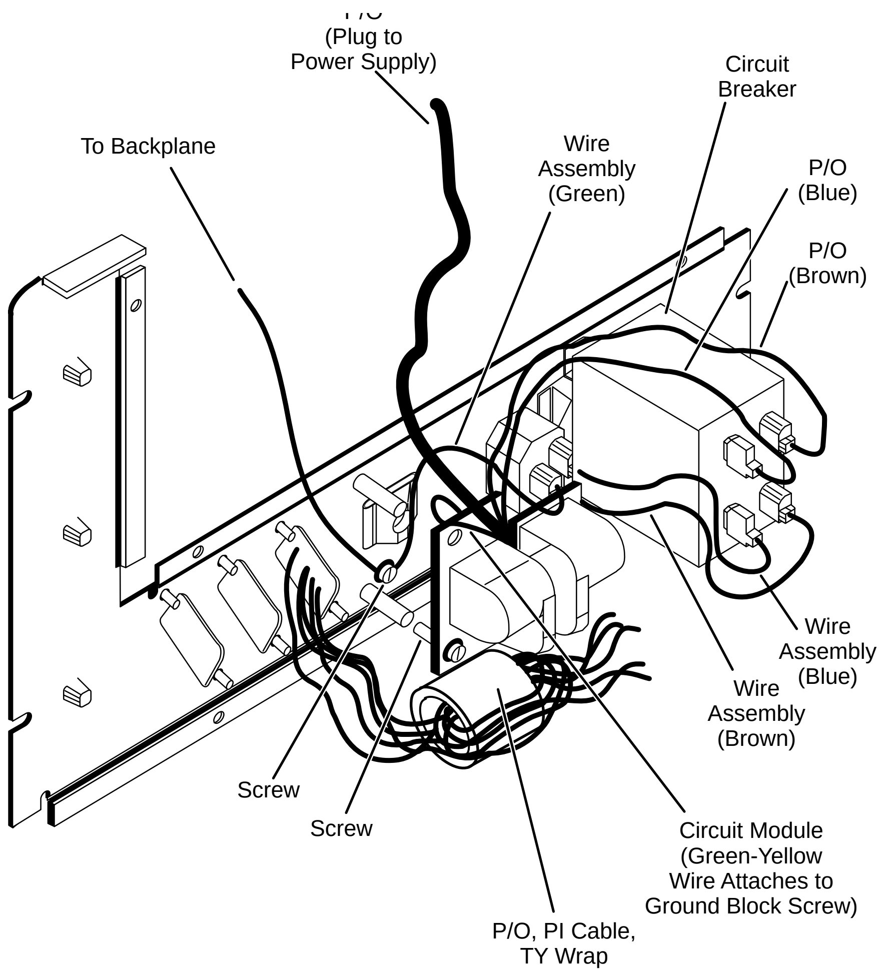


Figure 5-12. Power Supply Sub-Assembly (Inside View)

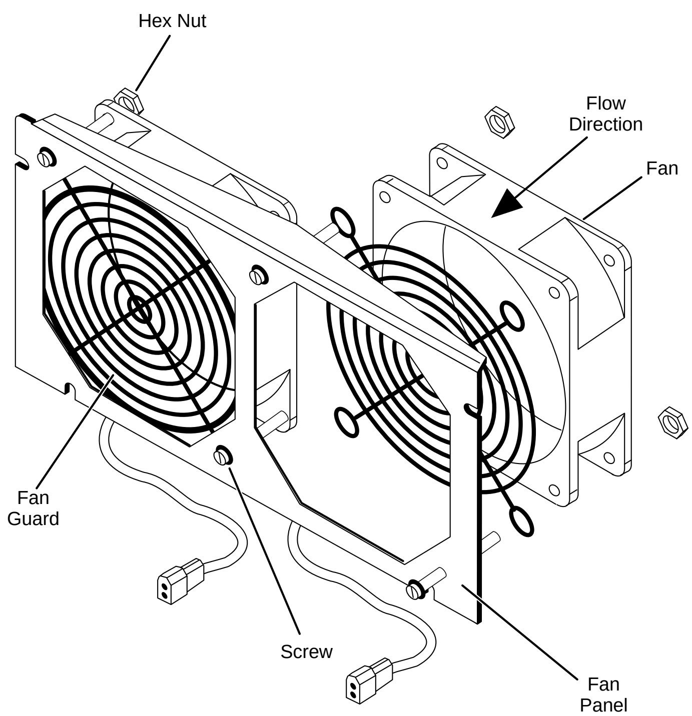


Figure 5-13. Fan Sub-Assembly

Power Supply

To replace the power supply, do the following:

1. Remove the four screws on the top of the CSCC.
2. Remove the four screws from the fan panel at the back of the unit. Then remove the fan panel.
3. If the G3vs unit is already attached to the wall, disconnect the entire fan panel.
4. Extending out from the power supply is a cord consisting of numerous individual wires. This cord plugs into the backplane. A Burndy connector is at the end of the cord. Squeeze the sides of the connector to release the latch. Then pull the connector off of the backplane.
5. Remove the power supply from the unit. Once the power supply is removed, disconnect the AC power cord.
6. Reconnect the AC power cord, insert the new power supply, reconnect the Burndy connector and the cord, reinsert (if removed) the reconnected fan panel, screw the fan panel back onto the unit, and reinsert the screws on the top of the unit.

Fans

To replace the fan(s), do the following:

1. At the back of the unit, remove the four screws from the fan panel. Then remove the panel.
2. If the G3vs unit is already attached to the wall, disconnect the entire fan panel.

   CAUTION:
   The power cord for each fan extends from a plug on the backplane. Do not tug on any of these cords. Otherwise, the corresponding plug on the backplane might come off.

3. Each fan has a power cord. At the end of each power cord is a plug and receptacle. Disconnect the plug for each fan that is to be replaced. Then remove the appropriate fan(s).
4. Install the new fan(s), reconnect the fan plug(s), reconnect the fan panel (if disconnected), and screw the fan panel back onto the back of the unit.

System Backup

System translations can be restored by using the data on the system or on the backup tape or memory card if the length of power failure is appropriate for the corresponding system. Table 5-1 lists the requirements:

Table 5-1. Requirements for System Backup

Minimum Length of Power Failure (in Minutes)	System
10	Multicarrier Cabinet Standard System
5	Multicarrier Cabinet High or Critical Reliability System
2	Single Carrier Cabinet Standard System
2	Single Carrier Cabinet High or Critical Reliability System

Save Translation

To ensure that the tape drive cassette tape or memory card contains the most recent copy of the translation data, the system can automatically save the translation data onto the cassette tape or memory card every 24 hours.

NOTE:
Automatic daily backup of the system translation data is controlled by an entry in the system parameters that is defaulted to "daily," which means the system automatically saves translation every 24 hours.

If many translation data changes are made, it is recommended that you save the translation data using the **save translation** command. This action saves the new changes on the cassette tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] without having to wait for the next automatic daily translation backup.

NOTE:
The **save translation** command, which includes saving translations as a part of scheduled maintenance, blocks all maintenance commands except some **list, display, monitor** and **status** commands.

The system blocks the execution of any commands that change translations, read the tape, or trigger a maintenance action (for example, **test board**, **busyout port**, etc.). Any attempt to issue such commands causes the system to display the following error message: "tape command active."

In systems that use memory cards, the **status card-mem** command is blocked during the save translation operation.

In a High or Critical Reliability system , if the **save translations** command is entered without a qualifier, an attempt is made to save the translations on *both* the Active and Standby SPE. If the command is qualified with either "spe-active" or "spe-standby," the translations are saved only on the specified SPE. For example, if, when the **save translations** command was issued, the translations were successfully saved on the Active SPE’s memory card, but were not successfully saved on the Standby SPE’s memory card, you would issue the **save translations spe-standby** command to save the translations on the Standby SPE’s tape as well.

In a 286 system, if extensive changes, additions, or deletions are made, translations should be saved more frequently, alternating the two tapes in the process. Then, in case of a power outage, only the data entered since the last "save" are lost. See the following sections on tape backup.

The system blocks the execution of any commands that change the translation, access a memory card, or trigger a maintenance action.

WARNING:
It is recommended that "save translations" be performed after business hours so that dial tone delays are not encountered.

WARNING:
Do not issue the "save translations" command when alarm conditions are present.

Save Recorded Announcements

In a 286 system, the recorded announcements in the system can be saved on the system cassette tape by entering the **save announcements spe active** or **spe standby** command. In later systems, such announcements can be saved on the system memory card by entering the **save announcements** command.

In a High or Critical Reliability system, if the **save announcements** command is entered without a qualifier, an attempt is made to save the integrated announcements on *both* the Active and Standby SPE. If the command is qualified with either "spe-active" or "spe-standby," the integrated announcements are saved only on the specified SPE. For example, if, when the **save announcements** command was issued, the integrated announcements were successfully saved on the Active SPE's memory card, but were not successfully saved on the Standby SPE's memory card, then you would issue the **save announcements spe-standby** command to save the announcements on the Standby SPE's tape as well.

WARNING:
The "save announcements" commands should only be used after business hours or when the system is operating during a low usage period. The system takes about 45 minutes to one hour to transfer the recorded announcements from the Announcement circuit pack to the system tape. During this interval, use of the administration terminal is blocked for other activities until the command completes.

Tape Backup for a 286 System Without High or Critical Reliability

Two cassette tapes are provided with the system. **It is recommended that a backup copy of the translation data be made weekly,** or after many changes have been made to the translation data. This minimizes the loss of recent translation data changes if the cassette tape in the system becomes damaged. Also, if a TN750 Announcement circuit pack is present, **it is recommended that a backup copy of the recorded announcements be made whenever they are changed.**

NOTE:
If there is an update file on the system cassette tape, contact the TSC to place a copy of the update file on the backup cassette tape. This step is not necessary if the backup cassette tape already contains a copy of the update file. Refer to the software configuration reports in the "list config software-version" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" to determine if there is an update file on the system cassette tape and backup cassette tape.

The following procedure can be used to make a backup tape.

1. Verify that the tape is not in motion. Place finger tips on tape cartridge and feel for tape movement. The LED on the TN774 Tape Drive circuit pack only lights while a read/write function is performed. The tape may be moving because of periodic maintenance or completion of a previously executed command that has caused the tape to operate. **Failure to do this may cause a tape alarm.** Remove the cassette tape from the tape drive.
2. Insert the other cassette tape into the tape drive.
3. Log in to the terminal.
4. Verify screen displays:

   enter command:
5. Enter `save translation` and press Return. This command instructs the system to take all translation information in memory and write it onto the cassette tape.
6. Screen displays:

SAVE TRANSLATION

Processor	Command Completion Status	Error Code
SPE_A	success/specific error message	x*

* where x = Error Code 0, 1, or 2.

The list of possible error codes and their interpretations for the `save translation` command is provided as follows:

Save Translation Command Error Codes

Code	Interpretation
0	The save operation was a complete success; both copies of tape translation data were updated.
1	The save operation was a partial success: only one of the two copies of tape translation data was updated. The tape drive should be repaired before any further save translation operation should take place.
2	The save operation failed completely; no translation was saved to either tape copy of translation data. The tape drive should be repaired before any further save translation operation should take place.

7. If a TN750 Announcement Circuit is present, enter `save announcements` and press Return. This command instructs the system to copy all the recorded integrated announcements from the system and write them onto the cassette tape. **This step is not necessary if the backup cassette tape already contains a copy of the current recorded announcements**. Refer to the software configuration reports in the "list config software-version" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", to determine the date of the announcement file on the backup cassette tape.
8. Remove the cassette tape from the tape drive and insert the other cassette tape into the tape drive.
9. Label the backup cassette tape with the date and time it was created. A special notation may be put on the tape to clearly distinguish it from other cassette tapes.
10. Store the backup tape in a secure place.

Tape Backup for a High or Critical Reliability 286 System

Four cassette tapes are provided with the system. **It is recommended that backup copies of the translation data be made weekly,** or after many changes have been made to the translation data. This minimizes the loss of recent translation data changes if the cassette tapes in the system become damaged. Also, if a TN750 Announcement circuit pack is present, **it is recommended that a backup copy of the recorded announcements be made whenever they are changed.**

NOTE:
If there is an update file on the system cassette tapes, contact the TSC to place a copy of the update file on the backup cassette tapes. This step is not necessary if the backup cassette tapes already contain a copy of the update file. Refer to the software configuration reports in the "list config software-version" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", to determine if there is an update file on the system cassette tapes and backup cassette tapes.

The following procedure can be used to make backup tapes:

1. Verify that the tape is not in motion. Place finger tips on tape cartridge and feel for tape movement. The LED on the TN774 Tape Drive circuit pack only lights while a read/write function is performed. The tape may be moving because of periodic maintenance or completion of a previously executed command that has caused the tape to operate. **Failure to do this may cause a tape alarm and an SPE interchange.**
2. Remove the two cassette tapes from the tape drives.

3. Insert the other two cassette tapes into the tape drives.
4. Log in to the terminal.
5. Verify screen displays:

   enter command:
6. Enter **save translation** and press RETURN. This command instructs the system to take all translation information in memory and write it onto the two cassette tapes.
7. Screen displays:

SAVE TRANSLATION

Processor	Command Completion Status	Error Code
SPE_A[1]	success/specific error message	x[2]
SPE_B[1]	success/specific error message	x[2]

1 The Active SPE's status is always displayed first. The upper right portion of the display illustrates the Active SPE. In a High or Critical Reliability system, if a qualifier is used to save translation for only one SPE, only that SPE's status is given

2 where x = Error Code 0, 1, or 2.

The list of possible error codes and their interpretations for the save translation command is provided below:

Save Translation Command Error Codes

Code	Interpretation
0	The save operation was a complete success; both copies of tape translation data were updated.
1	The save operation was a partial success: only one of the two copies of tape translation data was updated. The tape drive should be repaired before any further save translation operation should take place.
2	The save operation failed completely; no translation was saved to either tape copy of translation data. The tape drive should be repaired before any further save translation operation should take place.

8. If a TN750 Announcement Circuit is present, enter save announcements and press RETURN. This command instructs the system to copy all the recorded integrated announcements from the system and write them onto the two cassette tapes. **This step is not necessary if the backup**

cassette tapes already contain a copy of the current recorded announcements. Refer to the software configuration reports in the "list config software-version" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", to determine the dates of the announcement files on the backup cassette tapes.

9. Remove cassette tapes from the tape drives and insert the other two cassette tapes into the tape drives.
10. Label the two backup cassette tapes with the date and time they were created. A special notation may be put on the tapes to clearly distinguish them from other cassette tapes.
11. Store the backup tapes in a secure place.

Tape Errors

Since the tape drive is a mechanical device, tape-related failures may occur. When these failures occur, the system responds with "tape error messages." The following is a list of the "tape error messages" and recommended responses to each. Check for the proper operation after each response is done.

1. **Tape access failure; no tape cartridge or device failure**—Implies that the cassette tape is missing or improperly seated. This error can also occur if the tape drive has a hardware problem.

   Response: Check tape drive for missing or improperly seated cassette tape.

   Check tape drive for missing or improperly seated cassette tape.

   Check cassette tape to determine if write-protect latch is in the "RECORD" position. If so, turn latch away from "RECORD" position to allow "write" capability.

   Refer to the "Tape Drive Head Cleaning Procedure" section in the "TAPE (Tape Unit) [G3iV1.1-286]" Maintenance documentation.

   WARNING:
   Check for damaged or worn cassette tape. If cassette tape is damaged, do not insert the backup tape. If the backup tape is inserted, it may also be destroyed.

2. **Tape currently in use**—Implies that the system is currently accessing the tape for administration or maintenance purposes.

   Response: Wait a few minutes and repeat command that generated tape error message.

3. **Tape write failure; cartridge or device failure**—Implies that there was a failure in writing to the tape.

   Response: Refer to the procedures in message 1.

4. **Tape read failure; cartridge or device failure**—Implies there was a failure reading from the tape.

   Response: Refer to the procedures in message 1.

5. **System error; please try again later.**

   Response: Follow normal maintenance procedures for resets. Refer to "System Reset and Reboot Indications." Wait one minute and try again.

6. **Internal translation data is corrupted**—Implies that the translation data is inconsistent and the translation was not saved on tape.

   Response: Replace cassette tape with system backup tape.

   Enter the **reset system 3** command. After command completes, remove the backup tape and install the original tape, and then repeat the command that generated the error message. If the same error message is displayed again, escalate the problem.

7. **Translation file is too large to fit on the tape**—Implies that the system software has malfunctioned.

   Response: Follow normal escalation procedures.

8. **Cannot access the Standby SPE at this time**—Implies that the Standby SPE in a High or Critical Reliability system is not accessible. To determine state of the SPE, issue the **status system** command. If the Standby SPE is in Maintenance Mode, try again later.

9. **Tape translation data corrupted**—Implies error encountered in saving translation. If error occurs again, escalate the problem.

10. **Error encountered, can't complete request**—Implies error encountered in saving translation. If error occurs again, escalate the problem.

Memory Card Backup

In case of a power failure, the system translations can be restored using the Memory Card.

Translation data can be saved during the daily scheduled maintenance. However, if the translation data changes frequently, translations should be saved frequently to ensure that the most up-to-date information is kept.

Note that only one Memory Card is provided with the system. It is recommended that the customer purchase additional Memory Cards to serve as backup or replacement Memory Cards. Memory Cards should be alternated periodically.

It is also recommended that backup copies of the translation data be made weekly, or after many changes have been made to the translation data. This minimizes the loss of recent translation data changes if the Memory Card in the system becomes damaged.

WARNING:
"Save translation" should not be performed if any Memory Card alarm conditions occur or if the system is having problems.

WARNING:
It is recommended that "save translation" be performed after business hours so that dial tone delays are not encountered.

Enter the **save announcements** command to save the recorded announcements in the system on the system Memory Card.

NOTE:
A 10 Mb Memory Card or larger is required to save and restore announcements.

The system takes about 30 minutes to complete this task. Because the administration terminal is unavailable during this time, it is recommended that this command be used after business hours. During this time period, the administration terminal cannot be used to administer the system until the transfer is complete; however, all other administration terminals (if provided) are allowed to perform administration procedures.

Enter the **restore announcements** command to restore the recorded announcements from the Memory Card back into system memory. The system takes about 22 minutes to complete this task. **After completing the task, the system performs an audit to make sure that the announcements on the announcement circuit pack match the announcements administered in the switch.**

The working copy of the announcements is stored on the announcement circuit pack. A backup copy should be made on a 10 Mb Memory Card or larger. The following procedure is used to make a backup Memory Card:

1. Remove the Memory Card from the Netcon circuit pack.
2. Insert the backup Memory Card into the Netcon circuit pack.
3. Log in to the terminal.
4. Verify that the screen displays: `enter command:`
5. Enter the **save translation** command and press RETURN. This command instructs the system to take all translation information in memory and transfer it into the Memory Card.

The following display appears:

```
 save translation                                                    SPE A
                              SAVE TRANSLATION

Processor                       Command Completion Status        Error Code

SPE_A                                   Success                      0

Command successfully completely

enter command:
```

Screen 5-1. Save Translation — SPEA

6. Verify that the command successfully completes. If it does not successfully complete, an error message appears instead. In such a case, refer to the "Memory Card Errors" section.
7. If the system is equipped with a TN750 Announcement circuit pack, the recorded announcements can be saved using the **save announcement** commands. Enter the command and press RETURN.

   The following display appears:

```
save announcements
                              SAVE ANNOUNCEMENTS

Processor                     Command Completion Status          Error Code

SPE_A                                 Success                        0

Command successfully completely

enter command:
```

Screen 5-2. Save Announcements Screen — SPEA

8. Verify that the command successfully completes. If it does not successfully complete, an error message appears instead. In such a case, refer to the "Memory Card Errors" section.
9. Remove the backup Memory Card from the slot in which it is installed, and insert the original Memory Card into that slot.

10. Label the backup Memory Card with the date and time it was updated. A special notation may be put on the card to clearly distinguish it from other Memory Cards.
11. Store the backup Memory Card in a secure place.

Memory Card Errors

Memory Card-related failures may occur for two reasons: the card is at fault, or the Netcon circuit pack is at fault. When either failure occurs, the system responds with "error messages." The following is a list of the error messages and recommended responses to each message. Check for proper operation after each response is done.

1. **Cannot access file storage area**—Implies that the wrong Memory Card may be installed.

   Response: Check to see which Memory Card is installed. If the correct one is installed, test it. If it passes, and if the problem still persists, escalate the problem to the next level of support.

2. **Cannot turn on 12 volt power supply**—Implies that something may be wrong with the Netcon circuit pack, which contains the power supply.

   Response: Test the 12-volt power supply by entering the **test card-mem** command from the system administration terminal. Executing this command causes the system to run Test 701 (12 Volt Power Supply Test). If the power supply test fails, replace the Netcon circuit pack. To do this, follow the instructions in the Maintenance manual for the

   12V-PWR MO. Then repeat whichever command failed.

3. **Invalid directory on Card-Mem**—Implies that the Memory Card needs refreshing.

   Response: Run **test card-mem** and be sure all tests pass.

4. **Card-Mem is unusable**—Implies that something is wrong with the Memory Card.

   Response: Replace the Memory Card.

5. **Could not write to Card-Mem**—Implies that something may be wrong with the Memory Card.

   Response: Test the Memory Card.

6. **Cannot access mass storage system now; try again later**—Implies that the storage system is in use.

   Response: Try again later.

7. **Request is incompatible with currently running operations**—Implies that the storage system is in use.

   Response: Try again later.

8. **Card-Mem is not inserted in the system**

   Response: Insert the Memory Card.

9. **Cannot access file; wrong type of Card-Mem is inserted**—Implies that the correct Memory Card for the desired operation has not been inserted.

   Response: Load the appropriate Memory Card.

10. **File size exceeded**—Implies that there is no more file space.

    Response: Call your Lucent Technologies representative.

11. **Upgrade Memory Card inserted**—Implies that the System Upgrade Memory Card may have been inserted instead of the translations memory card.

    Response: Insert the translation Memory Card.

12. **Card-Mem is write-protected**—Implies that the switch on the top side of the Memory Card is incorrectly set.

    Response: Move the switch to the correct position, as shown in Figure 5-14:

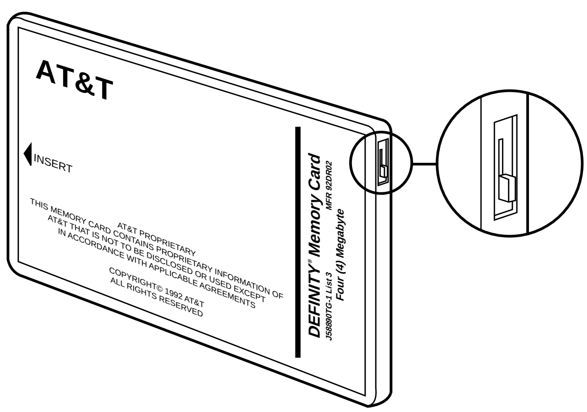


Figure 5-14. Memory Card Switch Position

13. **Transmission problem; please try later**—Implies that there is a problem communicating with the announcement circuit pack.

Response: Check to see that the announcement circuit pack has been correctly administered. Use the **change data** *<extension_number>* command. Verify that the announcement circuit pack is in the correct slot in the processor. If so, wait and retry.

14. **Command has been aborted; please try later**—Implies that the command has been pre-empted.

    Response: Try again later.

15. **Saved copy of translations is unusable**—Implies that the copy of the translations on your Memory Card is faulty.

    Response: Re-enter the **save translation** command.

Software Upgrade

The software upgrade feature permits a DEFINITY system to upgrade its software to include new features and to fix software problems. In a 286 system, performing an upgrade on a system without High or Critical Reliability requires a **reset system 4** (reboot) and thus causes a service disruption (refer to Chapter 4, "Initialization and Recovery". Performing an upgrade on a system equipped with High or Critical Reliability requires only a **reset system 2** (Cold-2) restart that is less disruptive (once again, refer to Chapter 4, "Initialization and Recovery").

WARNING:
No administration changes should be entered during the following software upgrade procedure. There can be substantial time gaps between steps and, since the system cannot prevent administration changes, it is up to the system technician to make sure that none are attempted during the entire software upgrade process.

NOTE:
This section does not apply to processor hardware upgrades such as upgrading a 386 system to a Release 5 vs/si or later system. See "Upgrades and Additions/Software Upgrades".

Procedure on a 286 System Without High or Critical Reliability

1. Perform a sanity check on translations by issuing the **list station** and **display station <ext>** commands. The translations are corrupted if the response "Error encountered, can't complete request" appears or if too few or many stations are listed for the **list station** command or if the response "Entry is bad" appears for the **display station <ext>** command. If the translations are corrupted, use the **list configuration software** command to determine the date and time of the translations in memory and the tape. Then insert the backup tape and use the **list configuration software** command to determine the date and time of the backup translations on the tape. If the primary and backup translations were saved at times less than a day apart, read in the backup tape via the **reset system 3** command to load translations from the backup. **Note that this operation causes a service interruption (up to 5 minutes depending on system size).** Then check the newly-loaded translations as above. If the backup is also corrupted or the primary and backup translations are more than a day different (the newer translations may have changes on it), escalate the problem.

   WARNING:
   *The **reset system 3** command must run to completion with the tape cartridge in the tape drive. If the tape cartridge is removed before the "Login" prompt is displayed on the administration terminal, the system may contain partial translations. If the tape cartridge contains new firmware (Processor Interface or Packet Control), wait until the firmware is downloaded before removing the tape cartridge. Do not use the state of the yellow LED on the tape drive to determine when the tape cartridge can be removed while executing this command.*

2. Reserve one old tape and issue the **save translations** command to the remaining copies. Check that the command successfully completes before proceeding. This stores current translations. The reserved tape leaves a backup in the event of storing corrupted, partial, or no translations to the other copies.
3. Replace the old tape cartridge with the new tape cartridge containing the new software.

4. Save translations to the new tape using the **save translations** command.

   WARNING:
   The command response on the administration terminal should indicate that the command successfully completed. If the tape cartridge is removed before the result is displayed on the administration terminal, the tape cartridge may contain no translations or just one of the two copies of the translations that are stored. Do not use the state of the yellow LED on the tape drive to determine when the tape cartridge can be removed while executing this command.

5. If a TN750 Announcement circuit pack is present, save recorded announcements to the new tape cartridge using the **save announcements** command. This operation takes approximately 45 minutes. Check that the command successfully completes (via the administration terminal) before proceeding.
6. Enter **upgrade software4** to load in and run the new software.

   NOTE:
   This step does not have to be performed immediately after the previous step. It can be performed remotely later at a more convenient time.

7. Issue the **save translations** command to the other copies of the new software.
8. If a TN750 Announcement circuit pack is present, issue the **save announcements** command to the other copies of the new software. This operation takes approximately 45 minutes per copy. Check that the command successfully completes (via the administration terminal) before proceeding.
9. If the system is not running properly or the translations seem to be incorrect, the reserved tape cartridge can be used to go back to the old release via the **upgrade software** command.

Procedure on a High or Critical Reliability 286 System

1. Perform a sanity check on translations by issuing **list station** and **display station <ext>** commands. The translations are corrupted if the response "Error encountered, can't complete request" appears or if too few or many stations are listed for the **list station** command or if the response "Entry is bad" appears for the **display station <ext>** command. If the translations are corrupted, use the **list configuration software** command to determine the date and time of the translations in memory and tape. Then insert the backup tape in the Active SPE and use the **list configuration software** command to determine the date and time of the backup

translations. If the primary and backup translations were saved at times less than a day apart, you have the option of reading in the backup tape via the **reset system 3** command to load translations from the backup.

NOTE:
This operation causes a service interruption (up to five minutes depending on system size).

If you exercise this option, check the newly loaded translations as above. If the backup is also corrupted or the primary and backup translations are more than a day different (the newer translations may have changes on it), escalate the problem.

WARNING:
The reset system 3 command must run to completion with the tape cartridge in the tape drive. If the tape cartridge is removed before the "Login" prompt is displayed on the administration terminal, the system may contain partial translations. If the tape cartridge contains new firmware (Processor Interface or Packet Control), wait until the firmware is downloaded before removing the tape cartridge. Do not use the tape drive to determine when the tape cartridge can be removed while executing this command.

2. Reserve one old tape and issue the **status system** command to determine the state of the Standby SPE. If the Standby SPE is "down," this problem must be fixed before proceeding. If the Standby SPE is in the "standby" mode, issue the **save translations** command to the remaining old copies. Check that the command successfully completes before proceeding. This stores current translations. The reserved tape leaves a backup in the event of storing corrupted, partial, or no translations to the other copies.
3. Replace the old tape cartridges with the new tape cartridges containing the new software in both SPEs.
4. Save translations to the new tapes using the **save translations** command.

WARNING:
This command must pass on both tapes before you can proceed. Both new tapes must contain translations (rely on the output on the administration terminal rather than the yellow LED on the tape drive). If the save translations command fails, repeat the command. If there is a hardware failure causing translations saves to fail, this problem must be resolved before a software upgrade can be performed.

5. If a TN750 Announcement circuit pack is present, save recorded announcements to the new tape cartridges using the **save announcements** command. This operation takes approximately 90 minutes. Check that the command successfully completes (via the administration terminal) before proceeding.

6. Issue the **upgrade software** command. The Active SPE releases the Standby SPE that reboots from the new tape. The Standby software proceeds to the point where it has loaded in translations and awaits further instructions from the Active SPE. During this procedure, the following error codes (listed in the order in which they could occur) are possible:

   ```
   "Standby SPE busy with another task; for
   information use ‘status system’"
   ```

   ```
   "Upgrade failed; no communication with standby
   after new software booted"
   ```

   ```
   "Software Upgrade failed, could not perform an
   interchange"
   ```

   Once the Active SPE receives the message from the Standby SPE that it has finished loading in translations, the Active SPE initiates an SPE-interchange. The standby enters Active mode with a reset 2 (Cold-2). All calls are dropped, the system technician is logged off, and all port circuit packs are reset (may take several minutes to reset all circuit packs in a large system). Links are brought back up after the circuits packs are reset.

7. Upon restarting, the "new" Active SPE waits 5 minutes before initiating maintenance on the "new" Standby SPE. Use the 5-minute period to verify that the new software works. If it does not work, use the SPE-Select Switches to hard-select the former Active SPE (which still should have the old software). The system can restart with old working software. After these first 5 minutes, maintenance downloads the Processor Interface and Packet Control firmware to the Standby TN765 and TN778 circuit packs to ensure that these circuit packs are upgraded with the most current version of firmware.

8. Login to the "new" Active SPE.

9. Issue the **save translations** command to the other copies of the new software (see Warning in Step 4).

   NOTE:
   This can be done at Step 4.

   If, later, it is necessary to return to the old software, this upgrade procedure can be repeated using the tapes containing old software. In this case, repeat the preceding upgrade steps except for the save translations command. If the translations seem to be incorrect, the reserved tape cartridge can be used to read in translation (via reset system 3).

WARNING:
This procedure removes any administration changes that were entered after the initial upgrade was performed.

10. If a TN750 Announcement circuit pack is present, issue the **save announcements** command to the other copies of the new software. This operation takes approximately 45 minutes per copy. Check that the command successfully completes (via the administration terminal).

If the upgrade procedure fails in a High or Critical Reliability system, first verify that both SPEs are healthy (that is, no hardware problems are inhibiting the upgrade process). If it is not possible to upgrade because of problems, and if both SPEs are healthy, move the SPE-Select Switches to the Active SPE and use the preceding software upgrade procedure for a system without High or Critical Reliability. This causes a reset system 4.

Procedure on a System using Memory Cards

The software in a DEFINITY 386 or Release 5 vs/si or later system can be upgraded to include new features and to fix software problems. Performing an upgrade on a Standard Reliability system (that is, a system without High or Critical Reliability) requires a Reset System 4 (reboot) and thus causes a service disruption (refer to Chapter 4, "Initialization and Recovery". Performing an upgrade on a High or Critical Reliability system requires only a Reset System 2 (Cold-2) restart, which is less disruptive (refer to Chapter 4, "Initialization and Recovery").

CAUTION:
Be sure to read this section before attempting a software upgrade using memory cards. Upgrading with the procedure for a 286 system will only yield serious failures!

Also, do not enter any administration changes during the following software upgrade procedure. There can be substantial time gaps between steps and, since the system cannot prevent administration changes, it is up to the system technician to make sure that none are attempted during the entire software upgrade process. This includes making sure that no one (including the customer) is making administration changes through connections other than through the local administration terminal.

Operational Differences between Tape and Memory Card Systems

These systems contain flash memory technology instead of tape. Therefore, keep in mind the following operational differences when upgrading in such systems:

- **No Software Shadowing**. Unlike a 286 system, in which the software can be shadowed from the Active SPE to the Standby SPE, the flash memory on both SPEs must be upgraded individually. However, the shadowing of the translation data is preserved. The **upgrade software** command upgrades both SPEs, one at a time.

  NOTE:
  Be sure to execute the **list configuration software-vintage long** command after a software upgrade to check if both SPEs are running the same software release.

- **Processor Replacement**. Because software shadowing is not available, the standby processor circuit pack must contain the correct release or must be upgraded to the correct release as described in the circuit pack replacement procedure. See the "Repair Procedures for High and Critical Reliability" section in Chapter 8, "Reliability Systems: A Maintenance Aid" for details. A less detailed Standby Processor circuit pack replacement procedure is also provided in this "Software Upgrade" section.
- **Translation/Software Separate**. Unlike in a 286 system, where the software and translations reside on the tape, the software and translations reside in separate flash memory cards. Therefore, during a software upgrade, the software memory card(s) and the translation memory card(s) must be swapped at different stages of the upgrade. The user should sit through the entire duration of the **upgrade software** command execution in order to be in a position to swap memory cards correctly and in a timely fashion. If the cards are not swapped in such a manner, the **upgrade software** command might need to be re-executed.
- **No Translation Backup**. Due to the high cost of the flash memory cards, the customer may not have a backup translation memory card. Therefore, after a software upgrade, and before saving translations to the translation memory card, the user should ensure that the new software is running normally and that a backout procedure is not needed. Otherwise, the memory card **cannot** be used to bring up translations in the system if the new software is backed out with the old software.
- **Power Recycling**. In a system, a last resort recovery can be done by recycling power to the entire system during any failed software upgrade attempt. In a system with memory card(s) , **do not recycle power to invoke an upgrade software.** Refer to the "Standby SPEs" section for more details.
- **Failed Upgrades**. The Standby SPE must be in the Standby Mode before the **upgrade software** command can be executed in a High or Critical Reliability system. However, if an **upgrade software** command is accepted by the system and fails, the Standby SPE does not have to be in the Standby Mode for any subsequent **upgrade software** command to execute.

- **No Remote Upgrade**. Because software memory cards and translation memory cards must be swapped, the **upgrade software** command must be executed at the local administration terminal.
- **Software Memory Card**. The software currently running on a 286 system is available on the customer's premises. However, software memory cards are not available on the customer's premises. Therefore, it is important to ensure that the software memory card containing the software currently running on the switch is available before performing the software upgrade process. If a system has problems running the new software, the software memory card can be used in the software backout process. Make sure that no software backout is needed before saving translations with the new software because the new translation is not backward compatible to the old software.
- **G3MT Output**. A software upgrade is always performed on the Standby SPE. During a software upgrade, the output on the Standby SPE being upgraded is displayed on the G3MT. If any action is done to disrupt the upgrade (such as removing the software memory card), the Standby display remains in effect until a 20 minute timer expires. The timer is started upon execution of the **upgrade software** command. In the meantime, the G3MT displays only messages from the Standby SPE.

Standard Reliability (Simplex) Systems

The software upgrade for a Standard Reliability system takes up to 85 minutes, during which time service is interrupted for about 15 minutes. Upgrade software cannot be done remotely, and it must be performed at the local G3MT.

Ensure that the following items are available before proceeding:

- Software memory card with the software release running currently in the system
- Software memory card containing the new software to which the upgrade is to be done
- Translation memory card on which the system translations are to be saved (the card should already be in the system)
- Software patch (if it exists) that is currently applied to the system (this patch is downloaded if a software backout is required)
- Software release label to be applied to the processor circuit pack after a successful upgrade.

The following table indicates the processes and their corresponding time allotment for the upgrade procedure.

Process	Time (minutes)
save translation	10
save announcement	45
upgrade software	10
save translation	10
save announcements	45
miscellaneous	10
Total Time	130

CAUTION:
Be sure to read the "Operational Differences between Tape and Memory Card Systems" section before implementing the following procedure.

Figure 5-15 illustrates the output that appears on the G3MT during the upgrade procedure.

```
INITIATING SOFTWARE UPGRADE
MEM-CARD CHECKSUM                        PASSED
REPROGRAMMING MTP                        PASSED
ERASING MEMORY                           PASSED
REPROGRAMMING SPE                        PASSED
UPGRADE COMPLETE

REPLACE SOFTWARE MEM-CARD WITH TRANSLATION MEM-CARD

TN786 FLMM
INVOKING EMERGENCY TRANSFER
ROM CHECKSUM (= XXXX)                    PASSED
SOFT INT TEST                            PASSED
NMI TEST                                 PASSED
READ_WRITE MEMORY                        PASSED
MEMORY BOARD 1 PARITY BIT TEST           PASSED
MEMORY FUNCTIONAL TEST                   PASSED
FLASH TEXT CHECKSUM (= XXXX)             PASSED
RESET 4 (REBOOT) PERFORMED
```

Figure 5-15. G3MT Output for a Simplex System Software Upgrade (Typical TN786B. Output)

If translation corruption is detected the following message will be displayed on the copyright screen:

`WARNING: translation corruption detected; call AT&T distributor immediately`

The upgrade procedure is as follows:

1. Disable TTI during the upgrade using the **change system parameters feature** command (note that it must restore after the update).
2. Issue the **list configuration software-vintage** command to determine whether any patches have been applied.

   NOTE:
   If the switch is restored to the old software, the correct patches must be re-downloaded.

3. Verify that a software memory card containing the current system software is at hand. This card is needed in case the new software must be backed out.
4. Save translations to the translation memory card in the switch by issuing the **save translation** command. This step insures that the translation mem-card has the latest changes. Move slide on mem-card to write protect position. This command takes approximately 10 minutes to complete.

   NOTE:
   This step ensures that the translation memory card has the latest changes and can load translations if the new software must be backed out.

5. If a TN750 Announcement circuit pack is present, save the recorded announcements to the memory card on the switch by issuing the **save announcement** command. This command takes approximately 45 minutes to complete.

   NOTE:
   Make sure that the carrier containing the TN750 Announcement circuit pack is not powered down before the **save announcement** command successfully completes. Otherwise, all recorded announcements will be lost!

6. Verify that the new software memory card contains the correct software by checking the label on the card, and replace the translation memory card. Enter the **list configuration software-vintage** command to ensure that the software memory card contains the correct release.
7. Enter the **upgrade software** command at the G3MT. This command takes approximately 10 minutes (including system reboot) to complete.

The following is the explanation of the messages output to the G3MT. For a list of error messages of the **upgrade software** command, refer to Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

MEM-CARD CHECKSUM: Verify that the first test passes. If the checksum fails, refer to the "CARD-MEM (Memory Card)" section in Chapter 11, "Maintenance Object Repair Procedures".

REPROGRAMMING MTP: This step should complete almost instantaneously. If this step fails, the G3MT will not be functional, and the remainder of the upgrade will not be visible. Recover by recycling the power of the system. The system should automatically perform another upgrade due to the presence of the software memory card.

ERASING MEMORY: This step should take approximately three minutes.

REPROGRAMMING SPE: This step should take approximately two minutes. If this step fails, the system enters SPE-down mode. Recycle the power of the system to recover.

8. **REPLACE SOFTWARE MEM-CARD WITH TRANSLATION MEM-CARD:** Prompt with beeping to replace the software memory card with the translation memory card.

   NOTE:
   Perform this operation within two minutes, Otherwise, the system will boot up without translations. If this is the case, execute the **reset system 3** command with the translation memory card in the system to restore the translations to the system.

9. **FLASH TEXT CHECKSUM:** Verify that this test at the end of the booting diagnostics passes. If the checksum fails, refer to the "MEMORY" (386 system) or "PR-MEM (TN790 RISC Memory)" section in Chapter 11, "Maintenance Object Repair Procedures", for the processor circuit pack diagnosis before proceeding with a software upgrade retry.
10. Log into the system.
11. Issue the **list configuration software-vintage** command to check if the system is upgraded to the correct software version.
12. If the TTI was disabled in step 1 of the upgrade use the **change system parameters feature** command to enable the TTI.
13. Set the system time to the correct time of day.
14. Perform a sanity check on the system running the new software by executing the following commands in the order provided:
    1. **status system 1** (to check out unusual status in the system)
    2. **list station** (to ensure that the translation is read in properly)
    3. **display alarm** (to ensure that no alarm is raised in the system)

4. **list trunk-group** (to ensure that the translation is read in properly)
5. **list hunt-group** (to ensure that the translation is read in properly)

15. Once the system is determined to be sane and no software backout is needed, enter the **save translation** command to save translations onto the translation memory card. This ensures that there is no translation corruption and that the translation can be saved with the new software.

    NOTE:
    Once the translations are saved onto the translation memory card, the card cannot be used to read in translations if the new software is backed out with the old software.

16. Save announcements to the same translation mem-card as the upgraded translations. *This step is necessary only if* the **display announcements** lists announcements that are administered.
17. Re-label the processor circuit pack with the software release label supplied with the software memory card.
18. Return the Software Memory Card to Lucent Technologies.

Backout Procedures

If the system is not running properly or the translations seem to be incorrect, follow the technical escalation procedure. If the new load must be backed out (i.e., returned to the previous software load), the reserved mem-card can be used to go back to the old release via the **upgrade software** command.

High and Critical Reliability (Duplex) Systems

The upgrade procedure for High and Critical Reliability Systems takes up to two hours. Service is interrupted for about five minutes. The procedure cannot be done remotely, and it must be performed at the PPN (local) G3MT.

Ensure that the following items are available before proceeding:

1. Software memory card with the software release currently running in the system
2. Software memory card containing the new software to which upgrades are to be made
3. Translation memory cards on which to save system translations (these cards should already be in the system)
4. Software patch (if it exists) that is currently applied to the system (this patch is downloaded if a software backout is required)
5. Software release label to be applied to the processor circuit pack after a successful upgrade

The following table indicates the processes and their corresponding time allotment for the upgrade procedure.

Process	Time (minutes)
save translation	9
save announcement	45
upgrade software	15
save translation	9
miscellaneous	11
Total Time	90

CAUTION:
Be sure to read the ""Operational Differences between Tape and Memory Card Systems" section before starting this procedure.

Figure 5-16 presents output that appears on the G3MT during this procedure.

```
TN786 CLMM Release X.X.X
INITIATING SOFTWARE UPGRADE
MEM-CARD CHECKSUM                  PASSED
REPROGRAMMING MTP                  PASSED
ERASING MEMORY                     PASSED
REPROGRAMMING SPE                  PASSED

REPLACE SOFTWARE MEM-CARD ON B WITH TRANSLATION MEM-CARD

UPGRADE COMPLETE

REPLACE TRANSLATION MEM-CARD ON A WITH SOFTWARE MEM-CARD

TN786 CLMM Release X.X.X
INITIATING SOFTWARE UPGRADE
MEM-CARD CHECKSUM                  PASSED
REPROGRAMMING MTP                  PASSED
ERASING MEMORY                     PASSED
REPROGRAMMING SPE                  PASSED

REPLACE SOFTWARE MEM-CARD ON A WITH TRANSLATION MEM-CARD

UPGRADE COMPLETE
```

Figure 5-16. G3MT Output for a Duplex System Software Upgrade (Typical TN786 Output)

If translation corruption is detected the following message will be displayed on the copyright screen:

`WARNING: translation corruption detected; call AT&T distributor immediately`

1. Disable TTI during the upgrade using the change **system parameters feature** command (note that it must restore after the update).
2. Issue the **list configuration software-vintage long** command to determine whether any patches have been applied.

   NOTE:
   If the switch is restored to the old software, the patches **must** be downloaded again.

3. Verify that a software memory card containing the current system software is at hand. This software is needed in case the new software must be backed out.

4. Save the translations to the translation memory card in the switch by issuing the **save translation** command. This command takes approximately 10 minutes to complete.

   NOTE:
   This step ensures that the translation memory card has the latest changes. This command must pass on both memory cards. Otherwise, the translations will be lost. If the **save translation** command fails, repeat the command. If there is a hardware failure causing the **save translation** command to fail, this problem must be resolved before a software upgrade can be performed.

5. If a TN750 Announcement circuit pack is present, save the recorded announcements to the memory cards on the switch by issuing the **save announcement** command. This command takes approximately 80 minutes to complete.

   NOTE:
   Make sure that the carrier containing the TN750 Announcement circuit pack is not powered down before this **save announcement** command completes successfully. Otherwise, all recorded announcements will be lost!

6. Verify that the new software memory card contains the correct software by checking the label on the card, and replace the translation memory card in the Standby SPE. Enter the **list configuration software-vintage long** command to make sure that the software memory card contains the correct release.
7. Enter the **status system 1** command to check if the Standby SPE is in Standby Mode.
8. If not, issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode.
9. Again enter the **status system 1** command to check if the Standby SPE is now in Standby Mode.
10. Alternatively, the **busyout spe-standby** command followed by the **release spe-standby** command can be used if the **refresh spe-standby** command is not successful.
11. Again enter the **status system 1** command to check if the Standby SPE is in Standby Mode.
12. Enter the **upgrade software** command at the G3MT. The Standby SPE starts software upgrade from the software memory card. Progress of the upgrade is displayed on the G3MT.

    The following is the explanation of the messages output to the G3MT. For a list of the error messages for the **upgrade software** command, refer to the "Upgrade Software" section of Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

MEM-CARD CHECKSUM: Verify that the first test passes. If the checksum fails, refer to the "CARD-MEM (Memory Card)" section in Chapter 11, "Maintenance Object Repair Procedures".

REPROGRAMMING MTP: This step should complete almost instantaneously. If the Standby MTP programming fails, G3MT screen updates disappear even though the upgrade may continue. The Active SPE finally resets the screen, and the upgrade fails.

ERASING MEMORY: This step should take approximately three minutes.

REPROGRAMMING SPE: This step should take approximately two minutes. If the reprogramming fails in the midst of the upgrade, the Standby SPE is put into *SPE-down* mode. The display of the failed upgrade remains until the Active SPE resets the screen again. Retry the upgrade.

13. **REPLACE SOFTWARE MEM-CARD ON <STANDBY SPE> WITH TRANSLATION MEM-CARD:** Prompt with beeping to replace the software memory card in the Standby SPE with the translation memory card. The Standby SPE then boots up with translations, and it informs the Active SPE that it is ready to take over as the Active SPE.

   NOTE:
   Perform this operation within two minutes. Otherwise, the upgrade will abort. If the upgrade aborts, re-execute the **upgrade software** command.

14. **REPLACE TRANSLATION MEM-CARD ON <ACTIVE SPE> WITH SOFTWARE MEM-CARD:** Replace the translation memory card in the Active SPE with the software memory card. The presence of the software memory card in the Active SPE causes the system to perform a Level-2 SPE Interchange. All calls are dropped. While the new Active SPE is booting up, the new Standby SPE undergoes a similar software upgrade. The upgrade status continues to be reported on the G3MT, and no system technician login is displayed.

   NOTE:
   Perform this operation within two minutes. Otherwise, the upgrade will abort. If the upgrade aborts, re-execute the **upgrade software** command.

15. **REPLACE SOFTWARE MEM-CARD ON <STANDBY SPE> WITH TRANSLATION MEM-CARD:** Replace the software memory card in the new Standby SPE with the translation memory card. Upon inserting the translation memory card, the system technician login prompt is displayed on the G3MT and the Standby SPE boots up.

   NOTE:
   Perform this operation within two minutes, Otherwise, the Standby SPE will boot up without translations. However, it will recover the translation when the Active SPE enables memory shadowing and

puts the Standby SPE into Standby Mode about 15 minutes after the SPE Interchange.

16. Log into the system.
17. Issue the **display initcauses** command to ensure that the failure upgrade is not present. The following is an example of the output:

```
                INITIALIZATION CAUSES

    CauseActionEscalatedCarrierTime

Upgrade Software4no1B07/19 15:35
Upgrade Software2no1B07/19 15:42
```

18. Issue the **list configuration software-vintage long** command to ensure that both SPEs are running the same and correct software. If the software running on both SPEs is not the same, follow the instructions in the "Standby SPEs" section to recover the situation.
19. If the TTI was disabled in step 1 of the upgrade use the **change system parameters feature** command to enable the TTI.
20. Set the system clock to the correct time of day.
21. Perform a sanity check on the system running the new software by executing the following commands in the order provided:
    1. **status system 1** (to check out unusual status in the system)
    2. **list station** (to ensure that the translation is read in properly)
    3. **display alarm** (to ensure that no alarm is raised in the system)
    4. **list trunk-group** (to ensure that the translation is read in properly)
    5. **list hunt-group** (to ensure that the translation is read in properly)
22. Once the system is determined to be sane and no software backout is needed, enter the **save translation** command to save translations to the translation memory cards. This ensures that there is no translation corruption and that translations can be saved with the new software. If this step returns an error concerning corrupt translations, investigate to determine if the system is operating normally and escalate to the TSC. **DO NOT** override and save translations until you are **ABSOLUTLY** sure the system is operating properly. Failure to do this may result in loss of translations and require re-translation of the entire switch.
23. Save announcements to the same translation mem-card as the upgraded translations. *This step is necessary only if* the **display announcements** lists announcements that are administered.

NOTE:
Once translations are saved to the translation memory cards, translations cannot be read in if the new software is backed out with the old software.

24. Re-label the processor circuit packs with the software release labels supplied with the software memory card.
25. Return the Software Memory Card to Lucent Technologies.

Standby SPEs

The following procedure is used for upgrading just the Standby SPE in a High or Critical Reliability system due to software corruption (bad checksum) or reconciling situations like both SPEs are running different software versions. The procedure below is written from the perspective that the Standby SPE is in carrier B. *This procedure is NOT USED for replacing the Standby Processor.*

If you are not sure that the software memory card contains the correct software, plug it into the Active SPE and issue the list configuration software command. If the software matches and the UPDATE FILE Identifier displays none, continue with this procedure; otherwise escalate. Be sure to replace the translation memory card in the Active SPE.

1. Make sure that the SPE to be upgraded is running as the Standby SPE. Issue the status system 1 command and verify that the correct SPE is the Standby. If the SPE to be upgraded is the Standby, skip to Step 3, else continue with Step 2.
2. Issue the *reset system interchange* command to force SPE, which is to be upgraded, to be in the Standby Mode.
3. Enter the **status system 1** command to check if the Standby SPE is in Standby Mode. If the Standby SPE is in the Standby Mode, skip to Step 8, otherwise continue with Step 4.
4. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. A.
5. Enter the **status system 1** command to check if the Standby SPE is in Standby Mode. If the Standby SPE is in the Standby Mode, skip to Step 8, otherwise continue with Step 6.
6. Issue the **busyout spe-standby** command followed by the **release spe-standby** command.
7. Enter the **status system 1** command to check if the Standby SPE is in Standby Mode. If the Standby SPE is in the Standby Mode, continue with Step 8. Else escalate.
8. Enter the **upgrade software** command at the G3MT.
9. At the prompt of **REPLACE SOFTWARE MEM-CARD ON <STANDBY SPE> WITH TRANSLATION MEM-CARD**, replace the software memory card in the Standby SPE with the translation memory card. The Standby SPE then boots up with the translation.

   NOTE:
   Perform this operation within two minutes. Otherwise, the upgrade will abort.

10. At the prompt of **REPLACE TRANSLATION MEM-CARD ON <ACTIVE SPE> WITH SOFTWARE MEM-CARD**, IGNORE the prompt and hard-select the Active SPE by throwing the SPE-Select switches. This causes the upgrade to terminate without performing the SPE-Interchange.
11. Issue a **list configuration software-vintage long** command to check out the version of software running on both SPEs.
12. Apply the software release label supplied with the software memory card to the TN786B processor circuit pack on the Standby SPE.

Procedure for Replacing Standby SPE Processor

This procedure is used when the Standby Processor circuit pack is being replaced and the software is being loaded from the software memory card into the Processor circuit pack. This procedure is also used when the SPE to be upgraded contains no or partially erased software. The G3MT messages in this procedure assume carrier A is the Active SPE. This procedure is also described in greater detail in the “Circuit Pack Replacement Procedure” for any Standby SPE circuit pack in Chapter 8, "Reliability Systems: A Maintenance Aid".

1. Hard-select the current Active SPE by throwing the SPE-Select switches. This may cause a tone/clock switch to the Active SPE if the Tone-Clock circuit pack on the Standby SPE is active. However, this does not cause service disruption.
2. Insert the software mem-card into the Active SPE. Issue the list configuration software command. If the software matches and the UPDATE FILE Identifier displays none, continue with this procedure; otherwise escalate the problem. *Be sure to replace the translation memory card in the Active SPE.*
3. Insert the software memory card into the Standby SPE (that is the SPE to be upgraded).

CAUTION:
Do not insert the software memory card into the Active SPE and recycle power on the Active SPE. This causes an upgrade on the Active SPE without G3MT output! A software upgrade is always done in the Standby SPE.

4. Unseat the Standby Processor and plug in the replacement processor. If the problem is missing software, plug in the same processor. The G3MT displays progress of Software Upgrade.

CAUTION:
DO NOT remove power to the Standby SPE Carrier

5. At the prompt of **REPLACE SOFTWARE MEM-CARD ON <STANDBY SPE> WITH TRANSLATION MEM-CARD**, replace the software memory card in the Standby SPE with the translation memory card. The Standby SPE will then boot up with the translation.

   NOTE:
   Perform this operation within two minutes. Otherwise the Standby SPE will boot up without translations. However, it will recover the translations when the Active SPE enables memory shadowing to the Standby SPE.

6. At the prompt of **REPLACE TRANSLATION MEM-CARD ON <ACTIVE SPE> WITH SOFTWARE MEM-CARD**, *IGNORE* the prompt. Wait 3 minutes for the Standby SPE to initialize before proceeding to the next step.
7. Hit the "return" or the "cancel" key to get back the G3MT command prompt. Issue the **list configuration software-vintage long** command to ensure that both SPEs are running the correct software. Use the next step if the this command will not display the software versions, otherwise skip the next step.
8. Issue the busyout spe-standby followed by the release spe-standby commands. Wait 5 minutes for the Standby SPE to initialize and issue the status system 1 command. If the Standby SPE Mode is down, the Standby Processor failed to initialize. If the Standby SPE Mode is maint/init or maint/entering, issue this pair of commands up to 2 more times. *If this Step did not succeed, try this procedure again or escalate the problem*.
9. Issue the **status system 1** command and if SPE alarm counts are displayed, run component tests to resolve these alarms. Allowed tests include test spe-standby, test duplication-interface, and test shadow-link.
10. Throw the SPE-Select switches back to the neutral position. After 10 minutes, issue the status system 1 command to verify the Standby SPE Mode standby and no SPE alarm counts. If these conditions cannot be verified within 30 minutes, escalate the problem.
11. Apply the software release label supplied with the software memory card to the processor circuit pack on the Standby SPE.

Preventive Maintenance Procedures

The following preventive maintenance procedures should be followed when you are visiting customer sites:

Air Filters

Air filters should be inspected annually. If a filter is dirty or clogged, first tap it on the ground. If the filter is still dirty or clogged, then wash it with warm water and a mild detergent. A vacuum cleaner can be used if one is available. If there is no facility for washing or vacuuming the air filter, then replace the filter. Refer to CABINET Maintenance documentation for more information on air filters and fans.

Tape Head/Capstan

The tape drive head (also called the tape head) should be cleaned at least once a year. **Moreover, it should be cleaned as part of the preventive maintenance strategy. It is recommended that you inspect the tape head during each maintenance visit and that you clean the tape head several times a year**. In addition, a dated label should be placed on the tape drive unit after the tape head is cleaned. New tapes leave more abrasive particles on the tape head.

The tape head can be accessed for cleaning from the front of the drive by opening the tape access door with your finger. Refer to TAPE Maintenance documentation found in Chapter 11, "Maintenance Object Repair Procedures" for more details on cleaning the tape head.

Batteries

The batteries should be replaced every four years or whenever a POWER alarm occurs in the system.

AT&T Preventive Maintenance Log

Figure 5-17 shows a sample of the AT&T Preventive Maintenance Log. Whenever you complete any of the preventive maintenance procedures described in this section, be sure to fill in the requested information on the log form before you leave the customer's premises.

SYSTEM 75/DEFINITY® GENERIC 3

	SCHED. DATE	COMPL. DATE	COMPL. BY	SCHED. DATE	COMPL. DATE	COMPL. BY
AIR FILTERS[1]						
Inspect Annually						
Clean or replace						
System 75XE						
403-302-159						
System 75/G1 (Lg. & Med)						
403-326-820						

	SCHED. DATE	COMPL. DATE	COMPL. BY	SCHED. DATE	COMPL. DATE	COMPL. BY
TAPE HEAD / CAPSTAN[2]						
Clean annually*						

	SCHED. DATE	COMPL. DATE	COMPL. BY	SCHED. DATE	COMPL. DATE	COMPL. BY
BATTERY PACKS[3]						
Replace when an						
alarm is received,						

or every 4 years **
System 75/G1 (Lg. & Med.)
403-302-912
System 75XE 403-289-422 * It is recommended that the tape head/capstan be inspected several times per year and cleaned if necessary.
** Battery packs should also be replaced whenever a POWER alarm occurs.

Notes: Refer to CABINET Maintenance documentation Refer to TAPE Maintenance documentation Refer to POWER (for AC-Powered Systems) Maintenance documentation
NOTE: This form is to be posted with the equipment. DATE SYSTEM INSTALLED___________

Figure 5-17. Preventive Maintenance Log

System Features

In addition to the various maintenance and test commands (described in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids") that are available, the following system features may also be useful in troubleshooting certain system resources:

- Automatic Circuit Assurance (ACA)
- Busy Verification of Terminals and Trunks
- Trunk Group Busy/Warning Indicators to Attendant
- Trunk Identification by Attendant
- Facility Test Calls
- Analog Tie Trunk Back-to-Back Testing
- Terminating Trunk Transmission Testing
- Troubleshooting ISDN-PRI Problems
- Troubleshooting PRI Endpoint Problems
- Troubleshooting ISDN-PRI Test Calls

Complete descriptions of each feature are provided in the *DEFINITY Communications System Generic 3 Feature Description*, 555-230-204. Refer to *DEFINITY Communications System Generic 1 and Generic 3 — Console Operations*, 555-230-700, and *DEFINITY Communications System Generic 1 and Generic 3 Voice Terminal Operations* as required for detailed operating procedures (does not include Facility Test Calls, Analog Tie Trunk Back-to-Back Testing, Terminating Trunk Transmission Testing, Troubleshooting ISDN-PRI Problems, Troubleshooting ISDN-PRI Test Calls, or Troubleshooting ISDN-BRI Problems described in this chapter.)

Automatic Circuit Assurance

Requires the use of a display-equipped voice terminal (may be nondisplay type if the Voice Message Retrieval feature is provided) or an attendant console. An "ACA activate/deactivate" button (one per system) is required on the voice terminal or attendant console.

Automatic Circuit Assurance (ACA) assists users in identifying possible trunk malfunctions. The system maintains a record of the performance of individual trunks relative to short and long holding time calls. The system automatically initiates a referral call to an attendant console or display-equipped voice terminal when a possible failure is detected.

Holding time is the elapsed time from when a trunk is accessed to the time a trunk is released. When ACA is enabled via administration, the system measures the holding time of each call.

A short holding time limit and a long holding time limit are preset by the System Manager for each trunk group. The short holding time limit can be from 0 to 160 seconds. The long holding time limit can be from 0 to 10 hours. The measured holding time for each call is compared to the preset limits for the trunk group being used.

Measurements are not made on personal CO lines, out-of-service trunks, or trunks undergoing maintenance testing.

Busy Verification of Terminals and Trunks

Requires the use of a multi-appearance voice terminal or attendant console equipped with a "verify" button.

Busy Verification of Terminals and Trunks allows a user at a voice terminal or attendant console to make test calls to trunks, voice terminals, and hunt groups (DDC/UCD). These test calls check the status of an apparently busy resource. This provides an easy method to distinguish between a voice terminal or resource that is truly busy and one that only appears busy because of a trouble condition.

Trunk Group Busy/Warning Indicators to Attendant

Requires the use of an attendant console.

Trunk Group Busy/Warning Indicators to Attendant provides the console user with a visual indication of the trunk group status for each trunk group associated with the 12 Trunk Group Select buttons located on the console. Trunk groups with busy indications during nonbusy periods should be checked to ensure that the trunks are busy and not out-of-service. Use the Busy Verification of Terminals and Trunks feature to test the suspected faulty trunks.

Trunk Identification by Attendant

Requires the use of a display-equipped voice terminal or an attendant console equipped with a "trunk id" button.

Trunk Identification by Attendant allows a voice terminal or attendant console user to identify a specific trunk being used on a call. This is useful when a user experiences noise or poor transmission on a trunk call. The trunk identification (access code and group number) is displayed when the "trunk id" button is pressed while on a trunk call. Use of this feature is denied if there are more than two trunks on a call. If the call is trunk-to-trunk, the identification displayed is of the last trunk added to the call.

Facility Test Calls

The Facility Test Calls feature provides a voice terminal user the capability of placing test calls to access specific trunks, touch-tone (DTMF) receivers, time slots, and system tones. The test call can be made by a local voice terminal user by dialing an access code.

NOTE:
For the ISDN-PRI Test Call feature, see "Troubleshooting ISDN-PRI Test Call Problems" later in this chapter.

NOTE:
The following test call descriptions are for voice terminal users:

Trunk Test Call

The trunk test call accesses specific Tie or CO trunks. DID trunks cannot be accessed.

To place a call:

1. Dial the Facility Test Call Feature Access Code (for example, 197, see Note), and listen for dial tone.

   NOTE:
   The Facility Test Call Access Code (FAC) is administered on the Feature Access Codes Form. The 197 FAC code used here is an example. For more information on FAC, refer to *DEFINITY Communications System Generic 3 Implementation*, 555-230-653.

2. Dial the 6-digit port number "PCSSpp"

P	=	Part network number (1 for PPN or 2 or 3 for EPN)
C	=	Carrier number (A=1, B=2, C=3, D=4, E=5)
SS	=	Slot number (01—20)
pp	=	Port number

   The channels on a DS1 trunk are addressed by using the channel number for the port number.

3. Listen for one of the following tones:

   - Dial Tone or Silence—trunk is connected. Go to Step 4. If you hear a dial tone, it is coming from the far end. If the far end has been disabled, you do not hear dial tone. However, depending on far-end administration, you may still be able to dial digits. All digits dialed after the port number are transmitted using end-to-end DTMF signaling; therefore, if the trunk being tested is a rotary trunk, it is not possible to break dial tone.

- Reorder Tone—trunk is busy or maintenance busy.
- Intercept Tone— a trunk or touch-tone (DTMF) receiver has not been accessed.

4. Place a call. Even if you do not hear a dial tone, you may still be able to dial digits, depending on the administration of the far-end switch.

   All digits dialed after the port number are transmitted using end-to-end DTMF signaling; therefore, if the trunk being tested is a rotary trunk, it will not be possible to break dial tone.

   If the call does not go through (that is, no ringing), determine if the trunk circuit pack has been removed.

Touch-tone (DTMF) Receiver Test Call

The touch-tone (DTMF) receiver call accesses and tests the four touch-tone (DTMF) receivers located on the Tone Detector circuit pack. **To place the call:**

1. Dial the Facility Test Call Feature Access Code (for example, 197, see Note), and listen for dial tone.

   NOTE:
   The Feature Access Code (FAC) is administered on the Feature Access Codes Form. The 197 FAC code used here is an example.

2. Dial the 6-digit port number "PCSSpp":

P	=	Part network number (1 for PPN or 2 or 3 for EPN)
C	=	Carrier number (A=1, B=2, C=3, D=4, E=5)
SS	=	Slot number (01—20)
pp	=	Touch-tone (DTMF) Receiver Port number (01, 02, 05, or 06))

3. Listen for one of the following tones:
   - Confirmation Tone—touch-tone (DTMF) receiver is connected. Go to Step 4.
   - Reorder Tone—touch-tone (DTMF) receiver is busy.
   - Intercept Tone—a touch-tone (DTMF) receiver or trunk has not been accessed.
4. Dial **1234567890*#** and listen for Confirmation tone (test passed) or intercept tone (test failed). The test fails if the touch-tone (DTMF) receiver does not recognize all the touch-tone (DTMF) signals.
5. To test another touch-tone (DTMF) receiver, repeat Steps 2 through 4.
6. To terminate the test call, hang up the station set used for testing.

Time Slot Test Call

The time slot test call connects the voice terminal user to a specific time slot located on the TDM Buses (A or B) or out-of-service time slots. **Specific Time Slots To place the call:**

1. Dial the Facility Test Call Feature Access Code (for example, 197, see Note), and listen for dial tone.

   NOTE:
   The Feature Access Code (FAC) is administered on the Feature Access Codes Form. The 197 FAC code used here is an example.

2. Dial port network number (1 for PPN or 2 or 3 for EPN), then press # and the 3-digit time slot number "xxx," where:

   xxx = Time slot number (000 through 255 on Bus A and 256 through 511 on Bus B)

3. Listen for one of the following tones:
   - Confirmation Tone—time slot is idle or maintenance busy
   - Reorder Tone—time slot is busy
   - Dedicated Tone—One of the following tones is heard (see Table 5-2)

Table 5-2. TDM Bus Time Slot Numbers

TDM Bus A time slot	TDM Bus B time slot	Tone Heard
000	256	Reorder
001	257	Reorder
002	258	Reorder
003	259	Reorder
004	260	Reorder
005	261	Touch Tone 1 - 697Hz
006	262	Touch Tone 2 - 770 Hz
007	263	Touch Tone 3 - 852Hz
008	264	Touch Tone 4 - 941 Hz
009	265	Touch Tone 5 - 1209 Hz
010	266	Touch Tone 6 - 1336Hz
011	267	Touch Tone 7 - 1447 Hz
012	268	Touch Tone 8 - 1633 Hz
013	269	Dial Tone
014	270	Reorder Tone
015	271	Alert Tone
016	272	Busy Tone
017	273	Ringback Tone
018	274	Special Ringback Tone
019	275	2225 Hz Tone
020	276	Music
021	277	Tone on Hold
022-253	278-509	Confirmation (used for calls)
254	510	Reorder
255	511	Confirmation

Out-of-Service Time Slots To place the call:

1. Dial the Facility Test Call Feature Access Code (for instance, 197, see Note), and listen for dial tone.

   NOTE:
   The Feature Access Code (FAC) is administered on the Feature Access Codes Form. The 197 FAC code used here is an example.

2. Dial port network number (1 for PPN or 2 or 3 for EPN), then dial ****** and listen for the following tones:
   - Confirmation Tone—Connection is made. Go to Step 3.
   - Reorder Tone—No time slots are out-of-service.
3. Repeat from Step 1 to alternate between out-of-service time slots on TDM Bus A and B.

System Tone Test Call

The system tone test call connects the voice terminal user to a specific system tone. **To place the call:**

1. Dial the Facility Test Call Feature Access Code (for instance, 197, see Note), and listen for dial tone.

   NOTE:
   The Facility Test Call Access Code (FAC) is administered on the Feature Access Codes Form. The 197 FAC code used here is an example.

2. Dial port network number (1 for PPN or 2 or 3 for EPN), then dial * followed by the two-digit tone identification number listed in Table 5-3.
3. Listen for the tone that was specified.

NOTE:
For a definition of Call Progress Tones see *DEFINITY Communications System Generic 3 System Descriptions and Specifications, Issue 4 AT&T 555-230-206* Chapter 11, "Maintenance Object Repair Procedures".

Table 5-3. System Tone Identification Numbers

Number	Description
00	Null tone
01	Dial tone
02	Reorder tone
03	Alert tone
04	Busy tone
05	Recall dial tone
06	Confirmation tone
07	Internal call waiting tone
08	Ringback tone
09	Special ringback tone
10	Dedicated ringback tone
11	Dedicated special ringback tone
12	Touch tone 1
13	Touch tone 2
14	Touch tone 3
15	Touch tone 4
16	Touch tone 5
17	Touch tone 6
18	Touch tone 7
19	Touch tone 8
20	Chime
21	350 Hz
22	440 Hz
23	480 Hz

Continued on next page

Table 5-3. System Tone Identification Numbers — *Continued*

Number	Description
24	620 Hz
25	2025 Hz
26	2225 Hz
27	Counter
28	External call waiting
29	Priority call waiting
30	Busy verification
31	Executive override/intrusion tone
32	Incoming call identification
33	Dial zero
34	Attendant transfer
35	Test calls
36	Recall on don't answer
37	Audible ring
38	Camp-on recall
39	Camp-on confirmation
40	Hold recall
41	Hold confirmation
42	Zip tone
43	2804 Hz
44	1004 Hz (-16db)
45	1004 Hz (0 db)
46	404 Hz
47	Transmission test sequence 105
48	Redirect tone
49	Voice signaling tone
50	Digital milliwatt
51	440 Hz + 480 Hz

Continued on next page

Table 5-3. System Tone Identification Numbers — *Continued*

Number	Description
52	Music
53	Transmission test sequence 100
54	Transmission test sequence 102
55	Laboratory test tone 1
56	Laboratory test tone 2
57	Disable echo supervision dial tone
58	7 seconds of answer tone
59	4 seconds of answer tone
60	Restore music (or silence)
61	Warning tone
62	Forced music tone
63	Zip tone (first of 2 sent)
64	Incoming call ID (first of 2 sent)
65	Tone on hold
66	CO dial tone
67	Repetitive confirmation tone
68	Conference/bridging tone

Analog Tie Trunk Back-to-Back Testing

The TN760B circuit pack can be configured for back-to-back testing (also known as connectivity testing) by making translation and cross-connect changes. This testing configuration allows for the connection of Tie Trunks back-to-back in the same switch to verify the operation of Tie Trunk ports. The tests can be performed in either the E&M or simplex modes.

E&M Mode Test Procedure

The procedures to perform the Analog Tie Trunk port test in the E&M mode are as follows:

1. At the administration terminal, enter **list configuration trunks** command to determine which ports are assigned on the Tie Trunk circuit pack.

2. Enter **display dialplan** command to determine the Trunk Access Code (TAC) format.
3. Enter **display port xx** command for all ports defined in Step 1. This action displays the trunk groups to which the ports belong (that is, of which the ports are members).

   NOTE:
   See the "Handling Port Circuit Packs" section in this chapter for details on how to remove and replace port circuit packs.

4. Insert the circuit pack back into the slot.
5. Enter **display trunk xx p** command for each trunk group identified in Step 3. This command displays the specified trunk group on the administration terminal screen and prints a hard copy on the printer. Save this data for later use.
6. Remove all members defined by these ports from the trunk group(s) using the **ch trunk xx** command.
7. Remove the Tie Trunk circuit pack from the carrier slot.
8. Set the dip (option) switches for each of the two ports to be tested on the Tie Trunk circuit pack to "E&M mode" and "unprotected."
9. Enter **add trunk n** command to add a new (test) trunk group. Then enter the following information:
   - Group Type — tie
   - TAC — (use trunk access code obtained from dial plan)
   - Trunk Type (in/out) — wink/wink
   - Port — assign two of the ports from the tie trunk
   - Mode — E&M
   - Type — specify one port as t1 standard and other port as t1 compatible

   Examples of the Trunk Group forms are shown in Screen 5-3 and Screen 5-4.

.

```
display trunk-group 10                                          Page  1 of  5
                                TRUNK GROUP

Group Number: 10                  Group Type: tie          CDR Reports? y
  Group Name: tr 10                      COR: 1                    TAC: 110
   Direction: two-way       Outgoing Display? n       Data Restriction? n
MIS Measured? n
 Dial Access? y               Busy Threshold: 60          Night Service:
Queue Length: 0               Internal Alert? n    Incoming Destination:
   Comm Type: voice                Auth Code? n


TRUNK PARAMETERS

   Trunk Type (in/out): wink/wink        Incoming Rotary Timeout(sec): 5
    Outgoing Dial Type: tone                       Incoming Dial Type: tone
                                              Disconnect Timing(msec): 500
       Digit Treatment:                                       Digits:
          Used for DCS? n
        ACA Assignment? n

                  Baud Rate: 1200     Synchronization: async   Duplex: full
         Incoming Dial Tone? y                         Maintenance Tests? y
 Answer Supervision Timeout:                       Suppress # Outpulsing? n
```

Screen 5-3. Trunk Group Form (Page 1 of 2)

```
                                                           Page  2 of  5
                                TRUNK GROUP


GROUP MEMBER ASSIGNMENTS


                 Port      Name         Mode          Type    Answer Delay

              1: B1901                  E&M        t1 stan
              2: B1902                  E&M        t1 comp
              3:
              4:
              5:
              6:
              7:
              8:
              9:
             10:
             11:
             12:
             13:
             14:
             15:
```

Screen 5-4. Trunk Group Form — E&M Mode (Page 2 of 2)

10. Locate the Tie Trunk port terminal connections at the cross-connect field. For systems equipped with 110-type hardware, see Table 5-4; for systems equipped with 66-type hardware, see Table 5-5.
11. At the cross-connect field, disconnect outside trunk facilities from the Tie Trunk ports and mark the disconnected wires for later reconnecting the Tie Trunk ports back to normal operation. The D Impact Tool (AT-8762) is required to perform this step.
12. Use jumper wires (DT 24M-Y/BL/R/G and DT 24P-W/BRN) and the D Impact Tool to connect wiring between the two ports assigned in Step 9 at the cross-connect field. For example, if the two ports on the Analog Tie Trunk circuit pack are port 1 and 2, connect the wirings as shown below:

Port 1	Port 2
T1	T12
R1	R12
T11	T2
R11	R2
E1	M2
M1	E2
t1 stan E&M	t1 comp E&M

13. Check all wirings to verify good connections between the two test ports.
14. Place a call from one voice terminal to another voice terminal using the Tie Trunk ports assigned. Dial TAC and extension. For example, if TAC of Tie Trunk group is 110 and station number is 5012, then dial 110 5012. If the call cannot be made, either one of these ports could be defective. There are four ports on TN760B (port 1, 2, 3, and 4), try different combinations to determine defective ports.
15. If there is a defective port on the circuit pack, try to switch to an unused port. However, if all ports are normally used, then replace the circuit pack.
16. Disconnect the jumpers between two ports. Then use administration terminal and trunk printouts to restore all trunk group changes to normal values.

Table 5-4. Carrier Lead Appearances at 110 Cross-Connect Field

110 Connecting Block Terminals	CO TrunkTN74 or TN747B	Tie Trunk TN760 or TN760B
1	T1	T1
2	R1	R1
3		T11
4		R11
5		E1
6		M1
7	T2	T2
8	R2	R2
9		T12
10		R12
11		E2
12		M2
13	T3	T3
14	R3	R3
15		T13
16		R13
17		E3
18		M3
19	T4	T4
20	R4	R4
21		T14
22		R14
23		E4
24		M4
25	T5	
26	R5	
27		
28		

Continued on next page

Table 5-4. Carrier Lead Appearances at 110 Cross-Connect Field — *Continued*

110 Connecting Block Terminals	CO TrunkTN74 or TN747B	Tie Trunk TN760 or TN760B
29		
30		
31	T6	
32	R6	
32		
33		
34		
36		
37	T7	
38	R7	
39		
40		
41		
42		
43	T8	
44	R8	
45		
46		
47		
48		
49		
50		

Table 5-5. Carrier Lead Appearances at 66-Type Cross-Connect Field

110 Connecting Block Terminals	CO TrunkTN74 or TN747B	Tie Trunk TN760 or TN760B
1	T1	T1
2	R1	R1
3		T11
4		R11
5		E1
6		M1
7	T2	T2
8	R2	R2
9		T12
10		R12
11		E2
12		M2
13	T3	T3
14	R3	R3
15		T13
16		R13
17		E3
18		M3
19	T4	T4
20	R4	R4
21		T14
22		R14
23		E4
24		M4
25	T5	
26	R5	
27		
28		

Continued on next page

Table 5-5. Carrier Lead Appearances at 66-Type Cross-Connect Field — *Continued*

110 Connecting Block Terminals	CO TrunkTN74 or TN747B	Tie Trunk TN760 or TN760B
29		
30		
31	T6	
32	R6	
32		
33		
34		
36		
37	T7	
38	R7	
39		
40		
41		
42		
43	T8	
44	R8	
45		
46		
47		
48		
49		
50		

Simplex Mode Test Procedure

The procedures to perform the Analog Tie Trunk Port Test in the simplex mode are as follows:

1. Repeat Steps 1 through 7 of the E&M Mode Test Procedure.
2. Set the dip (option) switches for each of the two ports to be tested on the Tie Trunk circuit pack to simplex mode.
3. Enter **add trunk n** command to add a new (test) trunk group. Then enter the following information:
   - Group Type — tie
   - TAC — (use trunk access code obtained from dial plan)
   - Trunk Type (in/out) — wink/wink
   - Port — assign two of the ports from the tie trunk
   - Mode — simplex
   - Type — type 5

   An example of the Trunk Group Form Page 2 is shown in Screen 5-5.

```
                                                              Page  2 of  5
                                  TRUNK GROUP

GROUP MEMBER ASSIGNMENTS

                 Port      Name         Mode         Type    Answer Delay

              1: B1901                  simplex      type 5
              2: B1902                  simplex      type 5
              3:
              4:
              5:
              6:
              7:
              8:
              9:
             10:
             11:
             12:
             13:
             14:
             15:
```

Screen 5-5. Trunk Group Form — Simplex Mode (Page 2 of 5)

4. Locate the Tie Trunk port terminal connections at the cross-connect field. For systems equipped with 110-type hardware, see Table 5-4. For systems equipped with 66-type hardware, see Table 5-5.

5. At the cross-connect field, disconnect outside trunk facilities from the Analog Tie Trunk ports and mark the disconnected wires for later when the Tie Trunk ports are placed back into normal operation. The D Impact Tool (AT-8762) is required to perform this step.
6. Use jumper wires (DT 24M-Y/BL/R/G) and the D Impact Tool to connect wiring between the two ports assigned in Step 4 at the cross-connect field. For example, if the two ports on the Analog Tie Trunk circuit pack are ports 1 and 2, connect the wirings as shown below:

Port 1		Port 2
T1	————	T12
R1	————	R12
T11	————	T2
R11	————	R2
type 5 simplex		type 5 simplex

7. Repeat Steps 13 through 16 of the E&M Mode Test Procedure.

Terminating Trunk Transmission Testing

The Terminating Trunk Transmission (TTT) (noninteractive) feature provides for extension number access to three tone sequences that can be used for trunk transmission testing from the far end of the trunks.

The three test types should have extension numbers assigned on the Maintenance-Related System Parameters Form.

Test Type 100:_____ Test Type 102:_____ Test Type 105:_____

Test Type 100 provides:

1. 5.5 seconds of 1004 Hz tone at 0dB
2. Quiet until disconnect; disconnect is forced after one minute

Test Type 102 provides:

1. 9 seconds of 1004 Hz tone at 0dB
2. 1 second of quiet
3. This cycle is repeated until disconnect; disconnect is forced after 24 hours.

Test Type 105 provides:

1. nine seconds of 1004 Hz at -16dB
2. one second of quiet
3. nine seconds of 404 Hz at -16dB
4. one second of quiet
5. nine seconds of 2804 Hz at -16dB
6. 30 seconds of quiet
7. one half second of Test Progress Tone (2225 Hz)
8. approximately five seconds of quiet
9. forced disconnect

Troubleshooting ISDN-PRI Problems

The following flowchart, Figure 5-18 and Figure 5-19, defines a layered approach when troubleshooting ISDN-PRI problems. Since a problem at a lower layer affects upper layers, layers are investigated from low to high. In the flowchart, the DS1 facility is layer 1, the TN765 Processor Interface is layer 2, and the ISDN trunks are layer 3. Transient problems are diagnosed on Page 2 of the flowchart, Figure 5-19.

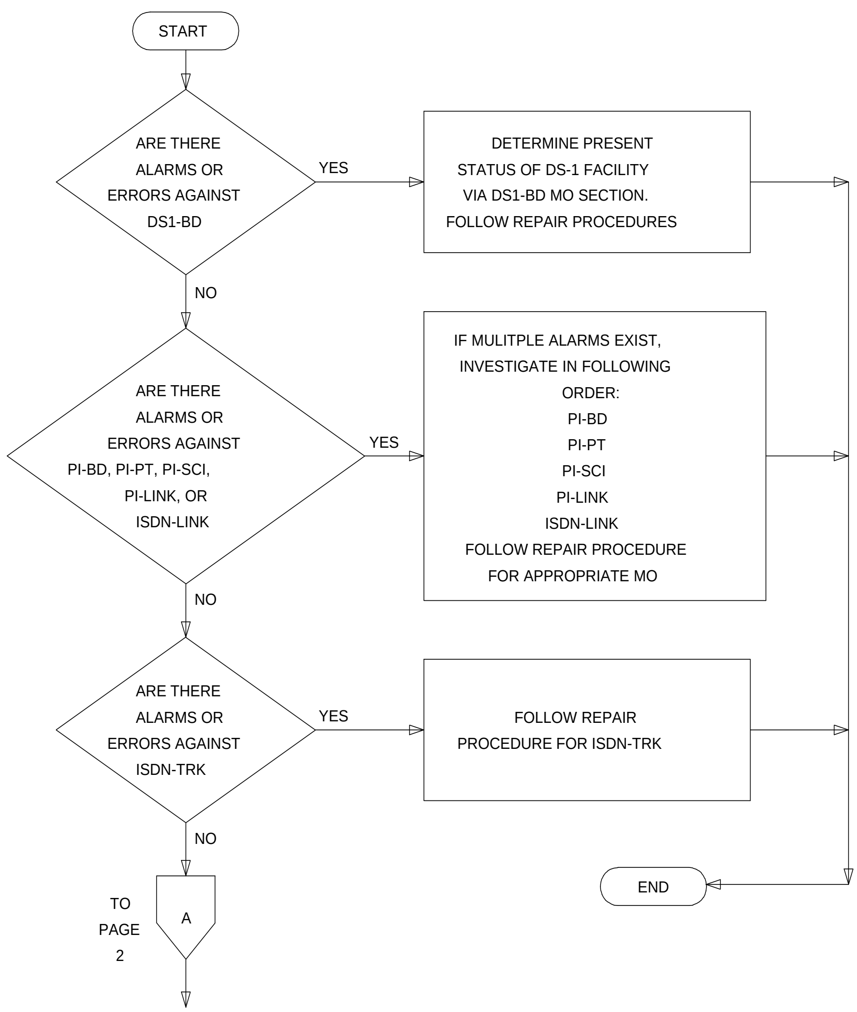


Figure 5-18. Processing of ISDN-PRI Problems (Page 1 of 2)

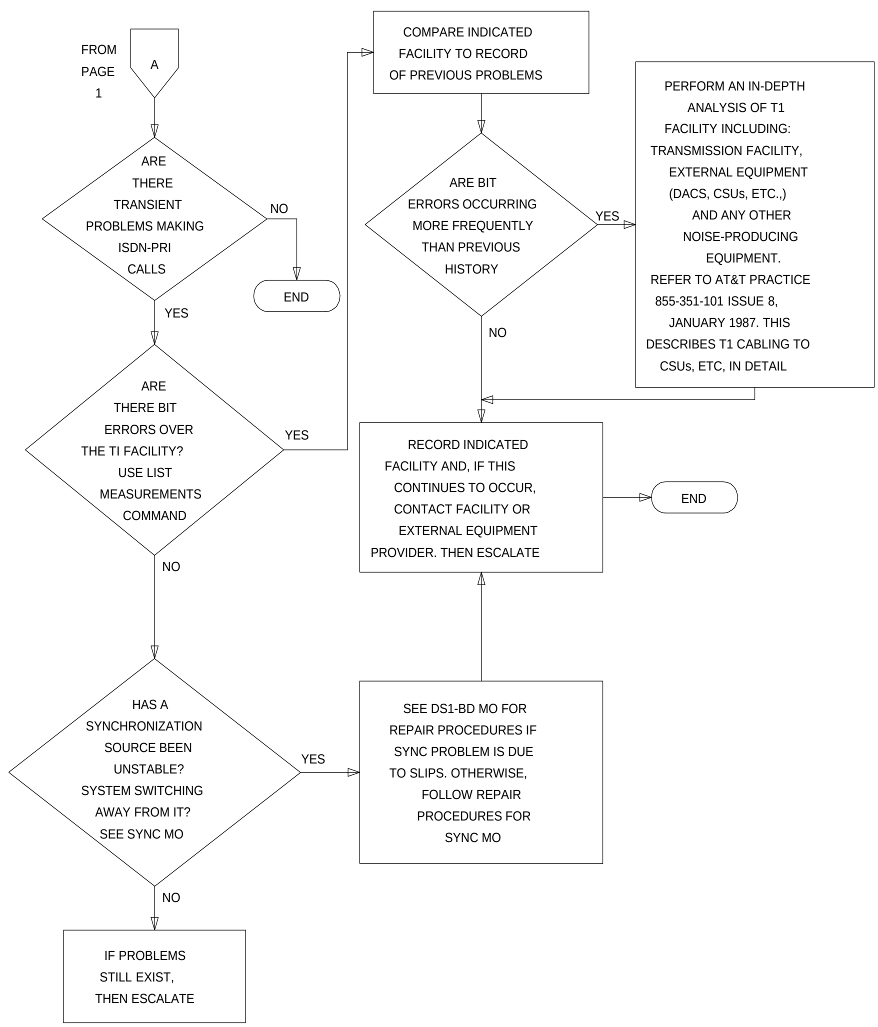


Figure 5-19. Processing of ISDN-PRI Problems (Page 2 of 2)

Troubleshooting PRI Endpoint Problems

The following flowchart, Figure 5-20 and Figure 5-21, defines a layered approach when troubleshooting PRI endpoint problems. Since a problem at a lower layer affects upper layers, layers are investigated from low to high. In the flowchart, the DS1 facility is layer 1, the TN765 Processor Interface is layer 2, and the ISDN trunks are layer 3.

The troubleshooting procedure described here diagnoses faults between the switch and the line-side PRI terminal adapter/ISDN-PRI endpoint equipment. Problems encountered on the network-side of a wideband connection or problems with end-to-end equipment compatibility are out of the scope of this section.

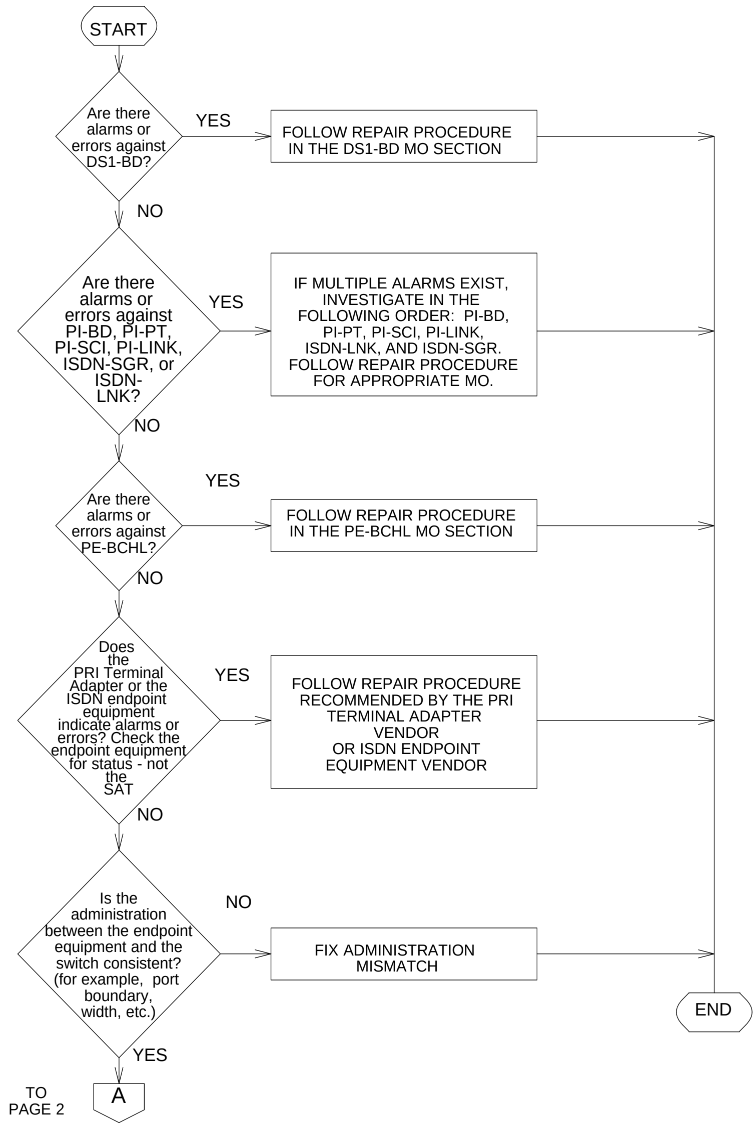


Figure 5-20. Processing of PRI Endpoint Problems (Page 1 of 2)

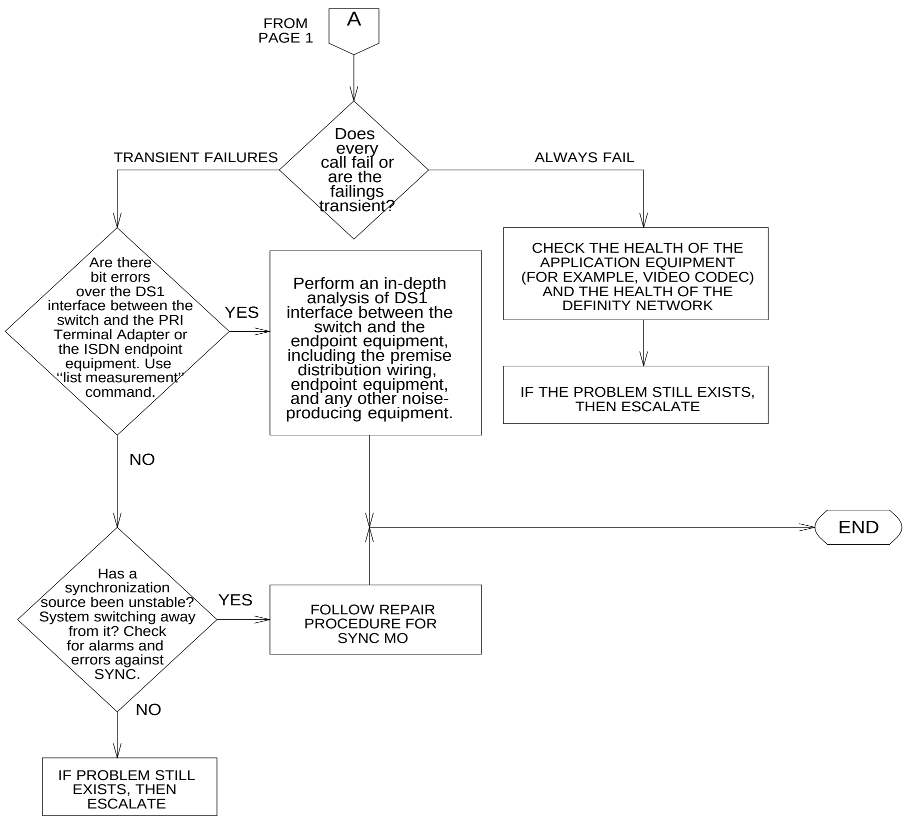


Figure 5-21. Processing of PRI Endpoint Problems (Page 2 of 2)

Troubleshooting ISDN-PRI Test Call Problems

An ISDN-PRI test call is a call of a diagnostic nature that is placed across an ISDN-PRI user-network interface to a previously designated number. An ISDN-PRI test call is also a maintenance procedure concerned with the identification and verification ISDN-PRI user-network interface problems. The ISDN-PRI test call can access ISDN-PRI trunks only.

Placing an Outgoing ISDN-PRI Test Call

NOTE:
An ISDN-PRI test call can be placed only if the circuit translates to an ISDN-PRI trunk.

An ISDN-PRI test call can be originated via either the *synchronous* or the *asynchronous* method. Each method is described below.

Synchronous Method

One command is used in this method to start, stop and query an ISDN-PRI test call. In the synchronous method, an outgoing ISDN-PRI test call may be part of a system technician-demanded long test sequence to test a circuit pack, port, or trunk. Therefore, the command line entry can be any of the following:

test trunk <grp>/<mbr> long [repeat #]

test port PCSSpp long [repeat #]

test board PCSS long [repeat #]

The "long" qualifier must be entered in the above commands in order for the ISDN test call to run. The repeat number (#) can be any number from 1 through 99 (default = 1).

The following information is displayed in response to the above commands:

- **Port**: The port address (PCSSpp) is the port network number, carrier designation, slot, and circuit of the maintenance object under test.
- **Maintenance Name**: The type of maintenance object tested.
- **Test Number**: The actual test that was run.
- **Test Results**: Indicates whether the test passes, fails, or aborts.
- **Error Code**: Additional information about the results of the test. (See the ISDN Trunk Maintenance documentation for details.)

Asynchronous Method

NOTE:
The asynchronous method requires a Maintenance/Test circuit pack to be physically present in the system.

In this method, four commands are used to start, stop, query, and list an outgoing ISDN-PRI test call. These commands are as follows:

clear isdn-testcall <grp>/<mbr> (stop)

list isdn-testcall (list)

status isdn-testcall <grp>/<mbr> (query)

test isdn-testcall <grp>/<mbr> [minutes] (start)

NOTE:
Before placing an outgoing ISDN-PRI test call, verify that the FAC on the System Features Form has been administered as well as the Far End Test Line No and TestCall Bearer Capability Class (BCC) on the Trunk Group Administration Form. Furthermore, if the ISDN-PRI trunk is of the "cbc" (call by call) service type, then the Testcall Service field on Trunk Group Administration Form must have been administered also.

To initiate an outgoing ISDN-PRI test call in the asynchronous method, issue the following command:

test isdn-testcall <grp>/<mbr> [minutes]

This command enables you to specify a specific the trunk on which to originate the ISDN-PRI test call.

NOTE:
The optional qualifier can also be used that specifies in minutes the duration of the test call. If no duration is specified, the default duration is used which is 8.4 or 9.6 seconds. The qualifier "minutes" accepts the numeric values one through 120 (that is, two hours = 120 minutes).

Screen 5-6 shows a typical response to the **test isdn-testcall** command:

```
test isdn-testcall

Port    Maintenance Name   Test Number   Test Result  Error Code

1B1501  ISDN-TRK             258           PASS
```

Screen 5-6. Typical Response to Test ISDN-Testcall Command

The meaning of the information displayed in response to the above command is described in the following list.

- **Port**: The port address (PCSSpp) is the port network number, carrier designation, slot, and circuit of the maintenance object under test.
- **Maintenance Name**: The type of maintenance object tested.
- **Test Number**: The actual test that was run.
- **Test Results**: Indicates whether the test passes, fails, or aborts.
- **Error Code**: Additional information about the results of the test. (See the ISDN Trunk Maintenance documentation for details.)

The functions of the **clear**, **list**, and **status** commands associated with the ISDN Testcall are summarized in the following list. For more detailed information, refer to the appropriate sections as directed.

- **Clear isdn-testcall <grp>/<mbr>** enables you to cancel an in-progress ISDN-PRI test call and allow another test call to start. For details on this command, refer to the **clear isdn-testcall** command description in the "Clear Commands" section of Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

- **List isdn-testcall <grp>/<mbr>** enables you to list all the ISDN-PRI trunks in use for an ISDN-PRI test call in the system. For details on this command, refer to the **list isdn-testcall** command description in the "List Commands" section of Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".
- **Status isdn-testcall <grp>/<mbr no> [minutes]** enables you to check on the progress of an outgoing test call. When an outgoing ISDN-PRI test call completes in a specific port network, another ISDN-PRI trunk from the same port network is available for testing (regardless of whether the **status** information has been displayed). For details on this command, refer to the **status isdn-testcall** command description in the "Status Commands" section of Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

Troubleshooting the Outgoing ISDN-Testcall Command

If the TestCall BCC field appears on the Trunk Group Administration Form, make sure the TestCall BCC field indicates the correct BCC for the service provisioned on the ISDN-PRI trunk. The TestCall BCC values are defined as follows:

- 0—Voice
- 1—Digital Communications Protocol Mode 1
- 2—Mode 2 Asynchronous
- 3—Mode 3 Circuit
- 4—Digital Communications Protocol Mode 0 (which is usually the default).

NOTE:
If the ISDN-PRI trunk is of type "cbc," make sure the TestCall Service field on the Trunk Group Administration Form indicates the correct service so that a network facility message can be sent across the ISDN-PRI network.

If the outgoing ISDN-PRI test call keeps aborting, please make sure that the far-end device can handle DCP Mode 0 or DCP Mode 1.

NOTE:
Before attempting to make an ISDN-PRI test call to the public network (that is, the network is the far-end), make sure that test call service is provisioned by the network. The user must subscribe to Test Type 108 service and have the correct far-end test call number administered on the trunk group form for the call to be allowed.

Troubleshooting Backplane Voltage Problems

The TN2036 Voltage Range circuit pack is a test tool that allows easy access to the backplane pins that provide various voltages to control and port slots. Probes from a voltmeter can be plugged into the access point for the desired voltage and a ground access point to measure the voltage. This circuit pack itself has instructions for use printed on the side as well as a listing of the voltage tolerance range for each voltage on the front panel. The voltages and tolerances are as follows:

ringing voltage: 75 -> 115 VAC

+12 VDC: 11.4 -> 12.6 VDC

+5 VDC: 4.95 -> 5.35 VDC

-5 VDC: -4.95 -> -5.35 VDC

-48 VDC: -43 -> -53 VDC

neon message waiting voltage: -80 VDC -> -165 VDC

The type of carrier cabinet determines where the circuit is placed to measure the voltages. For a multicarrier cabinet, all voltages except +12 VDC can be measured from any port slot. However, the neon message waiting voltage requires that the system have a TN752 or TN755 Power Unit circuit pack. The +12 VDC is not provided in multicarrier cabinets.

For single-carrier cabinets, all voltages except +12 VDC and +5 VDC can be measured from any port slot. However, the neon message waiting voltage requires that the system have a TN752 or TN755 Power Unit circuit pack. The Tape Drive slot is used to measure +12 VDC.

NOTE:
All control circuit packs should be removed from the backplane before this measurement is made.

The +5 VDC measurement must be made in two separate cabinet locations since the power unit has two independent +5 VDC outputs [+5 VDC and +5(B) VDC]. Each output supplies a different section of the cabinet with power. For the control cabinet, make one measurement in the processor slot and another in any port slot. For an EPN control cabinet, make one measurement in any port slot from 1 to 4 and another in any port slot from 5 to 16. For a port cabinet, make 1 measurement in any port slot from 1 to 6 and another in any port slot from 7 to 18.

Accessing Alarms and Errors

6

General

The maintenance subsystem is that part of the software that is responsible for initializing and maintaining the system. Through Error and Alarm Logs, the maintenance subsystem maintains an error history of problems discovered in the system. The maintenance subsystem provides a user interface for on-demand testing.

The system is divided into separate entities called maintenance objects (MOs). Each MO is treated independently and is identified by what type of object it is (maintenance name) and where it is located in the system (physical name). Some examples of MOs are:

Maintenance Name	Physical Name
CO-TRK	1E1903
DETR-BD	1B05
TAPE	1A

The first two columns of the Error and Alarm Logs reflect similar information.

Error Generation/Tracking

All types of errors logged against an MO are kept in a maintenance record for that MO. This record is created when the first error is reported and remains active until maintenance determines that the problem no longer exists. A counter is kept for each type of error, and each time the error recurs, the associated counter is increased.

Maintenance monitors the status of the MO as long as a counter is active. (An active counter is a counter that has a non-zero value.) To prevent the record from being active forever, a "leaky bucket" mechanism operates on each in-line error counter to slowly reduce the counter value over time. An "in-line error" is the term used to describe an event or problem usually associated with a circuit pack or a port that occurs either during normal operation or during scheduled testing. Depending on the severity and frequency of an in-line error, the error may be resolved via the "leaky bucket" mechanism. Periodically (usually 15 minutes), these counter amounts are reduced. If the error is still being reported, the "leaky bucket" won't have much effect. However, if the problem is transient and errors are no longer being reported, the "leaky bucket" method provides a mechanism for the counters to be reduced and the maintenance record to be retired.

Once a maintenance record becomes active, testing is scheduled to run more frequently in order to monitor the behavior of the MO. The results of any tests that fail are recorded in the maintenance record. Each test has a counter associated with it; the counter is incremented when the test fails and is decremented when the test passes. If the tests abort because the object to be tested is in use, the counters are not incremented or decremented. The "leaky bucket" method is not used for counters associated with tests.

Alarm Generation Thresholds

Each error and test counter is assigned a threshold value. Accelerated testing begins when the error counter becomes active (that is, when its value becomes non-zero). In general, alarms are raised only by test failures; in-line errors, in most cases, do not raise alarms. An alarm is not resolved until "all" tests have passed and all alarming counters go to 0. The maintenance record is active until all counters are reduced to 0. Also, the Alarm Log shows an alarm for every active error in the Error Log. The alarm level is the highest level of alarm for all errors and test counters which still have non-zero values.

The following example illustrates these points: If there is an active error against an MO that causes a MINOR alarm and an active error that causes a MAJOR alarm, then the Alarm Log would show two MAJOR alarms. If the MINOR alarm problem is resolved first, the error is still marked as alarmed until the MAJOR alarm problem is resolved, and the Alarm Log would still show two MAJOR alarms. If the MAJOR alarm problem is resolved first, the error is still marked as alarmed until the MINOR alarm problem is resolved, and the Alarm Log would now show two MINOR alarms.

The active Hardware Error Log entries and the Alarm Log entries against a particular MO are not cleared from the logs until all the problems causing the alarms have been resolved.

Alarm Log

The system produces a software record of every alarm detected in the system. This record, the Alarm Log, can be displayed on the administration terminal or can be displayed remotely by Initialization and Administration System (INADS) personnel.

An entry in the Alarm Log is generated as a result of errors detected on an MO by automatic system tests, demand tests, and in-line error detection. The high-level software determines if the errors are serious enough, or if enough errors have occurred to warrant alarm status.

Alarms are retired if the problem is resolved and further maintenance tests indicate that the problem no longer exists. Alarms are also retired if the errors causing the alarm have not been reported for a predetermined time interval.

The Alarm Log is restricted in size. If the log is full, a new entry overwrites the oldest resolved alarm. If there are no resolved alarms, the oldest error (which is not alarmed) is overwritten. If the log consists of only active alarms, the new alarm is dropped. The Error Log is saved on tape by issuing a **reset system 4** or **reset system 5** command. Refer to Chapter 4, "Initialization and Recovery", for more information on the **reset** commands.

NOTE:
It is not recommended that a system restart be performed for the sole reason of saving the Error Logs to tape. In a MCC cabinet the Error Log is also saved to tape when the Processor Port Network (PPN) experiences an AC power loss that requires power to the port carriers in the PPN to be shut down (see "AC-POWER (AC Power) for AC-Powered Systems" Maintenance documentation for details). Caution should be used in relying on the Error Logs on a duplicated switch in a MCC cabinet after a power failure. If the active carrier was the A carrier at the time of the power failure the error logs will be saved to the A carrier mass-storage system. However when the power is restored the system will boot with the B carrier active. Also the old Error Log will be read in from the B carrier mass-storage system, thus the previously saved error logs will not be accessible.

Alarm Log Reporting Strategy

All Major and Minor alarms and possibly downgraded Warning alarms are reported to INADS. (For details on downgraded Warning alarms, refer to the description of the **set options** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".) When the system raises one of these alarms, an attempt is made to call INADS. If the call to INADS fails for whatever reason, the call is retried when the Repeated Dial Interval time has expired (The valid Repeat Dial Interval range is 1-20 minutes; the default value is 7 minutes.). After a total of four failed call attempts, the system waits one hour, after the hour is up, the system starts over with the same four call attempts. This cycle repeats until either the call to INADS successfully completes or until the "four call attempts cycle" is repeated six times. If at any time during the one hour interval, a new alarm is raised by the system that should be reported to INADS, all timers and counts are reset and the strategy is repeated from the very beginning.

During each of the four call attempts portion of the scenario described above, the ACK lamp on the attendant console is turned off. The ACK lamp flashes during the one hour interval, this indicates that the system is having trouble reporting alarms to INADS. At the end of the entire scenario just described, if the system could not report the alarm to INADS, the ACK lamp continues to flash.

Alarm Log and System Reset Interactions

In general, system restarts result in the removal of all Alarm Log entries and their associated Error Log entries from their respective logs. However, there are exceptions to this rule. Since alarms on processor complex MOs can cause PEIs (Processor Element Interchanges) followed by a Warm or Cold 1 restart on the new Active SPE, if these alarms were wiped out of the log during the restart, then information about what caused the PEI would be lost. Therefore, the following rules are used to determine which alarms are retired on system restarts.

- Warm and Cold 2 restarts—All alarms except those against the following Standby SPE MOs are resolved: DATA-CHL, DATA-BD, DATA-CON, PKT-CTRL, PI-BD, PI-PT, PROCR, MEM-BD, SW-CTL, TAPE, PR-MAINT, SHDW-CIR, DUPINT, CARR-POW (carriers A and B in the PPN only), STBY-SPE, SHDW-LNK.
- Cold 1 restarts—All alarms except those against the following Standby SPE MO are resolved: TAPE (only if there is a TAPE alarm of Error Type 3329).
- Reboots—All alarms are resolved.

NOTE:
The previous rules imply that on a standard system all alarms are resolved on all system restarts.

Hardware Alarm Reports

See the **display alarms** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for details.

Typical Alarm Log

Screen 6-1 is a typical Alarm Log display.

```
display alarms                                                        Page   1

                                 ALARM REPORT

Port        Maintenance On   Alt     Alarm   Svc    Ack?  Date         Date
            Name        Brd? Name    Type    State  1 2   Alarmed      Resolved

01A         MEMORY      y            MAJOR          y n   04/16/11:48 00/00/00:00
01C10       DID-BD      y            MINOR          n n   04/16/12:03 00/00/00:00
01A         TONE-PT     n            WARNING              04/16/11:48 00/00/00:00
01C07       DS1-BD      n            WARNING              04/16/11:49 00/00/00:00
01D19       DS1-BD      y            WARNING              04/16/12:00 00/00/00:00
01C1001     DID-TRK     y    04/01   WARNING OUT          04/16/12:03 00/00/00:00
01C16       UDS1-BD     y            WARNING              04/16/12:03 00/00/00:00





Command successfully completed
Command:
```

Screen 6-1. Alarm Log Display Output

Information contained on the display is listed under columns as follows:

- **Port:** Physical location of the MO.
- **Maintenance Name:** Abbreviated identifying name of the MO.
- **On Board?:** A "y" (yes) means that the fault detected is on the associated circuit pack. An "n" (no) means that the fault has not been localized to a circuit pack. On-board alarms cause the red LED on the circuit pack to light, whereas off-board alarms do not.
- **Alt Name:** Extension number for terminals or trunk group number for trunk groups.
- **Alarm Type:** "MAJOR," "MINOR," or "WARNING."
- **Svc State:** "IN," "OUT," or "RDY."
  - — "IN" stands for "in-service" and indicates that an MO is currently in-service.
  - — "OUT" stands for "out-of-service" and indicates that an MO is currently not operational.

— "RDY" stands for "ready-for-service" and indicates that an MO (a trunk, for example) has been busied out by system technician at the local end. Therefore, while no outgoing calls are permitted, a trunk may still attempt to service incoming calls.

- **Ack?:** A "y" (yes) or "n" (no) indicates whether or not the alarm has been acknowledged. A "c" in the Resolved Alarm Log indicates a cleared alarm notification message was acknowledged by INADS.
- **Date Alarmed:** Month, day, hour, and minute that the alarm was raised.
- **Date Resolved:** Month, day, hour, and minute that the alarm was resolved. **00/00/00:00** is displayed for active alarms.

If a number of alarms are active, the log can be used with the List of Alarms in Table 6-1 to determine which alarms should be cleared first. The list presents all the alarms that can occur in the system in their descending order of urgency. Alarms should always be cleared in this order.

Table 6-1. List of Alarms

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
AC-POWER	Major	On	AC Power
DC-POWER	Major	On	SCC[2] Environmental Sensors
PROCR	Major	On	Processor
MEMORY	Major	On	Memory
TONE-PT	Major	On	Tone-Clock
TDM-CLK	Major	On	Tone-Clock
TDM-CLK	Major	Off	Tone-Clock
TDM-BUS	Major	On	TDM Bus
TAPE	Major	Off	Tape
SW-CTL	Major	On	Network Control
RING-GEN	Major	On	Analog Ring Generator
INADS	Major	Off	INADS Link
PKT-BUS[3]	Major	On	Packet Bus
DTMR-PT	Major	On	Tone Detector
GPTD-PT	Major	On	Tone Detector
CLAS-PT[3]	Major	On	Call Classifier Port

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
TONE-BD	Major	On	Combined Tone Generator
EXT-DEV	Major	On	External Alarm Lead
EXP-LINK	Major	Off	Expansion Interface Links
EXP-INTF	Major	On	Expansion Interface
EXP-INTF	Major	Off	Expansion Interface
PKT-CTRL[3]	Major	On	Packet Control
PKT-CTRL[3]	Major	Off	Packet Control
PI-SCI	Major	On	System Communications Interface
PI-SCI	Major	Off	System Communications Interface
PI-LINK	Major	On	Processor Interface Link
PI-LINK	Major	Off	Processor Interface Link
ADM-CONN[3]	Major	Off	Administered Connection
PI-BD	Major	On	Processor Interface
ISDN-SGRP[3]	Major	Off	ISDN-PRI Signaling Group
S-SYN-PT	Major	On	Speech Synthesizer Port
CABINET	Major	On	Cabinet Sensors
CARR-POW	Major	On	Carrier Port Power Unit
EMG-XFER	Major	On	Emergency Transfer
STBY-PE	Major	On	Standby SPE
BRI-BD[3]	Major	On	ISDN-BRI
MAINT	Major	On	EPN Maintenance
STRAT-3[3]	Major	On	Stratum 3 Clock
SYNC	Major	Off	Synchronization Maintenance
PI-PT	Major	On	Processor Interface Port
DUPINT	Major	On	Duplication Interface
SHDW-CIR	Major	On	Common Shadow Circuit
SHDW-CIR	Major	Off	Common Shadow Circuit
SHDW-LNK	Major	On	Memory Shadowing Link

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
SPE-SELEC	Major	On	SPE Select Switch
ABRI-PT[3, 4]	Major	On	ASAI ISDN-BRI Port
ABRI-PT[3 4]	Major	Off	ASAI ISDN-BRI Port
ASAI-ADJ[3 4]	Major	Off	ASAI
TAPE	Minor	On	Tape Control
TAPE	Minor	Off	Tape Recorder
TAPE	Minor	Off	Tape Cartridge
PR-MAINT	Minor	On	Maintenance/Tape Processor
PR-MAINT	Minor	Off	Maintenance/Tape Processor
MAINT	Minor	On	EPN Maintenance
TDM-BUS	Minor	On	TDM Bus
SW-CTL	Minor	On	Network Control
PKT-BUS[3]	Minor	On	Packet Bus
PKT-BUS[3]	Minor	Off	Packet Bus
EXP-INTF	Minor	On	Expansion Interface
EXP-INTF	Minor	Off	Expansion Interface
CABINET	Minor	On	Cabinet Sensors
POWER	Minor	Off	Power
TTR-LEV	Minor	On	Tone Detector
DTMR-PT	Minor	On	Tone Detector
GPTD-PT	Minor	On	Tone Detector
CLAS-PT[3]	Minor	On	Call Classifier Port
TONE-PT	Minor	On	Tone-Clock
TDM-CLK	Minor	Off	Tone-Clock
STRAT-3[3]	Minor	Off	Stratum 3 Clock
SYNC	Minor	Off	Synchronization Maintenance
EXT-DEV	Minor	Off	External Alarm Lead
ADM-CONN[3]	Minor	Off	Administered Connection

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
TAPE-DAT	Minor	Off	Tape Consistency
ISDN-LNK[4]	Minor	On	ISDN-PRI Signaling Link Port
ISDN-LNK[4]	Minor	Off	ISDN-PRI Signaling Link Port
M/T-PKT[3]	Minor	On	Maint/Test Packet Bus Port
M/T-DIG[3]	Minor	On	Maint/Test Digital Port
DATA-CHL	Minor	On	Network Control
DATA-CON	Minor	On	Network Control
PKT-CTRL[3]	Minor	On	Packet Control
TONE-BD	Minor	On	Tone-Clock
DETR-BD	Minor	On	Tone Detector
CLSFY-BD[3]	Minor	On	Call Classifier
ANN-BD	Minor	On	Announcement
M/T-BD[3]	Minor	On	Maintenance/Test
ANL-BD	Minor	On	Analog Line
DIG-BD	Minor	On	Digital Line
AUDIX-BD	Minor	On	DEFINITY AUDIX
HYB-BD	Minor	On	Hybrid Line
DT-LN-BD	Minor	On	Data Line
AUX-BD	Minor	On	Auxiliary Trunk
TIE-BD	Minor	On	Tie Trunk
DS1-BD	Minor	On	DS1 Interface
DS1-BD	Minor	Off	DS1 Interface
DID-BD	Minor	On	DID Trunk
MODEM-BD	Minor	On	Pooled Modem
S-SYN-BD	Minor	On	Speech Synthesizer
PI-BD	Minor	On	Processor Interface
DATA-BD	Minor	On	Network Control
MET-BD	Minor	On	MET Line

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
CO-BD	Minor	On	CO Trunk
BRI-BD[3]	Minor	On	ISDN-BRI
ISDN-TRK[4]	Minor	On	DS1 ISDN Trunk
CO-TRK[4]	Minor	On	CO Trunk
CO-TRK[4]	Minor	Off	CO Trunk
DID-TRK[4]	Minor	On	DID Trunk
DID-TRK[4]	Minor	Off	DID Trunk
AUX-TRK[4]	Minor	On	Auxiliary Trunk
TIE-TRK[4]	Minor	On	Tie Trunk
TIE-TRK[4]	Minor	Off	Tie Trunk
DS1-TIE[4]	Minor	On	DS1/DMI Tie Trunk
OPS-LINE[4]	Minor	On	DS1 OPS Line
S-SYN-PT	Minor	On	Speech Synthesizer
ANL-LINE[4]	Minor	On	8-Port Analog Line
ANL-16-LINE[4]	Minor	On	16-Port Analog Line (TN746)
ANL-NE-LINE[4]	Minor	On	8-Port Neon Analog Line (TN769/TN746)
DIG-LINE[4]	Minor	On	Digital Line
AUDIX-PT[4]	Minor	On	DEFINITY AUDIX
HYB-LINE[4]	Minor	On	Hybrid Line
HYB-LINE[4]	Minor	Off	Hybrid Line
MET-LINE[4]	Minor	On	MET Line
MET-LINE[4]	Minor	Off	MET Line
BRI-PORT[4]	Minor	Off	ISDN-BRI Port
DAT-LINE	Minor	On	Data Line
MODEM-PT	Minor	On	Pooled Modem
PDMODULE	Minor	On	Digital Line
TDMODULE	Minor	On	Digital Line
ANN-PT	Minor	On	Announcement

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
PRI-CDR	Minor	Off	Primary CDR Link
SEC-CDR	Minor	Off	Secondary CDR Link
PMS-PRNT	Minor	Off	PMS Log Printer
JNL-PRNT	Minor	Off	Journal Printer
SYS-PRNT	Minor	Off	System Printer
DUPINT	Warning	On	Duplication Interface
SPE-SELEC	Warning	Off	SPE Select Switch
SYNC	Warning	Off	Synchronization Maintenance
EMG-XFER	Warning	On	Emergency Transfer
DTMR-PT	Warning	On	Tone Detector
GPTD-PT	Warning	On	Tone Detector
CLAS-PT[3]	Warning	On	Call Classifier Port
CLAS-PT[3]	Warning	Off	Call Classifier Port
PI-BD	Warning	Off	Processor Interface
ADM-CONN[3]	Warning	Off	Administered Connection
DETR-BD	Warning	On	Tone Detector
CLSFY-BD[3]	Warning	On	Call Classifier
DETR-BD	Warning	Off	Tone Detector
CLSFY-BD[3]	Warning	Off	Call Classifier
BRI-BD[3]	Warning	Off	ISDN-BRI
ISDN-SGRP[3]	Warning	Off	ISDN-PRI Signaling Link
ANL-LINE	Warning	Off	8-Port Analog Line
ANL-16-LINE	Warning	Off	16-Port Analog Line (TN746)
ANL-NE-LINE	Warning	Off	8-Port Neon Analog Line (TN769/TN746)
DIG-LINE	Warning	Off	Digital Line
AUDIX-PT	Warning	Off	DEFINITY AUDIX
HYB-LINE	Warning	On	Hybrid Line
HYB-LINE	Warning	Off	Hybrid Line

Continued on next page

Table 6-1. List of Alarms — *Continued*

Maintenance Name	Alarm Level	On / Off Board[1]	Circuit Pack Name
MET-LINE	Warning	Off	MET Line
BRI-PT[3]	Warning	Off	ISDN-BRI Port
BRI-SET[3]	Warning	Off	ISDN-BRI Endpoint
PDMODULE	Warning	Off	Digital Line
TDMODULE	Warning	Off	Digital Line
ISDN-LNK	Warning	Off	DS1 ISDN Link
ISDN-TRK	Warning	Off	DS1 ISDN Trunk
CO-TRK	Warning	Off	CO Trunk
AUX-TRK	Warning	On	Auxiliary Trunk
TIE-TRK	Warning	Off	Tie Trunk
DID-TRK	Warning	Off	DID Trunk
DS1-BD	Warning	Off	DS1 Interface
DS1-TIE	Warning	Off	DS1/DMI Tie Trunk
OPS-LINE	Warning	Off	DS1 OPS Line
TAPE	Warning	Off	Tape Unit
TDM-BUS	Warning	On	TDM Bus
PRI-CDR	Warning	Off	Primary CDR Line
SEC-CDR	Warning	Off	Secondary CDR Line
PMS-PRNT	Warning	Off	PMS Log Printer
JNL-PRNT	Warning	Off	Journal Printer
SYS-PRNT	Warning	Off	System Printer
AUDIX-RES		On	DEFINITY AUDIX

1 On Board means that the fault detected is on the associated circuit pack.
Off Board means that the fault has not been localized to a circuit pack.

2 SCC stands for Single-Carrier Cabinet.

3 G3iV1.1-286, G3iV2-386

4 Alarms on this MO may appear as warnings. Use the **set options** command to determine current valid settings.

Error Log

See the **display errors** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for details.

Terminal Alarm Notification

This type of alarm exists for customers who have administered feature buttons on voice terminals or the attendant console to represent several types of alarms. A maximum of 10 digital and/or hybrid voice terminals may be used.

When an alarm occurs, the green (status) lamp associated with the assigned button assumes a steady state.

The lamp may be turned off by pressing the button associated with the lighted alarm lamp. If the lamp is turned off, and the alarm has not been resolved by the time maintenance reschedules testing, the green (status) lamp resumes its steady state.

Each alarm type and its meaning is described here:

NOTE:
The text of each button label appears in parenthesis.

- Administered Connection Alarm (ac-alarm)—lights if a locally administered connection (ADM-CONN) has a Major, Minor, or Warning alarm active.
- Auto Wakeup Journal Printer Alarm (pr-awu-alm)—lights if the automatic wakeup journal printer has a Major, Minor, or Warning alarm active.
- DS1 Facility Alarm (ds1-alarm)—lights if a DS1-BD has an off-board Major, Minor, or Warning alarm active.
- Facility Access Alarm (trk-ac-alm)—lights when the facility access trunk test feature is used.
- Major Alarm (major-alrm)—lights if any Major alarm in the system is active.
- Major/Minor Alarm (mj/mn-alrm)—lights if any Major or Minor alarm in the system is active.
- PI Link Alarm (link-alarm)—lights if links (1 through 8) have a Major, Minor, or Warning alarm active.
- PMS Printer (pr-pms-alm)—lights if the PMS printer has a Major, Minor, or Warning alarm active.
- RS-Alert (rs-alert)—lights if a system **reset system 2 or 3** is performed.
- CDR1-Alarm (smdr1-alrm)—lights if the Primary Link has a Major, Minor, or Warning alarm active.

- CDR2-Alarm (smdr2-alrm)—lights if the Secondary Link has a Major, Minor, or Warning alarm active.
- System Printer Alarm (pr-sys-alm)—lights if the System Printer (SYS-PRNT) has a Major, Minor, or Warning alarm active.

LED Interpretation

7

General

The lighting and unlighting of LEDs indicates to the system user the status of various maintenance components in the system. LEDS are located on the attendant console, on all circuit packs in the switch cabinets and, optionally, on customer-designated voice terminals. The following LEDS are included in the system:

- Processor circuit pack and maintenance circuit pack LEDs
- Duplication interface circuit pack LEDs
- Attendant console LEDs
- Carrier power unit LEDs
- Power distribution unit LEDs
- Control and port circuit pack status LEDs

Processor Circuit Pack and Maintenance Circuit Pack LEDs

The front panels of the Processor circuit pack (PPN carrier A, PPN carrier B in a High or Critical Reliability system) and Maintenance circuit pack (EPN carrier A) are identical. Each has two groups of LEDs. One group indicates the status of the pack, and the other group (which includes the Major, Minor, and Warning alarms described previously) reflects maintenance conditions in the entire system (that is, the PPN and EPN cabinets). See Figure 7-1.

- Red (alarm)—the system has detected a fault in this circuit pack.

  NOTE:
  Alarms on the TAPE, PROCR, and PR-MAINT MOs [286 System] or on the PROCR, PR-MAINT, and MEMORY MOs [386 System], PR-MEM [Release 5vs/si and later] are indicated by the red LED on the Processor circuit pack.

- Green (test)—the system is running tests on this circuit pack.

  NOTE:
  On the Standby Processor circuit pack, green means that the Standby Switch Processing Element (SPE) is not refreshed (that is, it is in Maintenance or Down Mode).

  NOTE:
  On the Maintenance circuit pack, the green LED may blink very faintly once per second. This is the normal operating state of the Maintenance circuit pack. The faint blink is due to a once-per-second self-test executed by the Maintenance circuit pack.

- Amber (busy)—this circuit pack is in use. In a High or Critical Reliability system, the amber LED is always unlit on the Standby Processor and Memory circuit packs even when in Maint mode.
- MAJOR ALARMS (red)
- MINOR ALARMS (red)
- WRNG (warning) ALARMS (amber)
- ACK (acknowledgment) (green)—indicates Major or Minor alarms have been reported to INADS
- EMERGENCY TRANSFER (red)—indicates emergency transfer has been invoked

  NOTE:
  If the AC power cord is unplugged from the control SCC, the emergency transfer feature will be invoked, however the

EMERGENCY TRANSFER LED (red) will not be lit, due to loss of AC power.

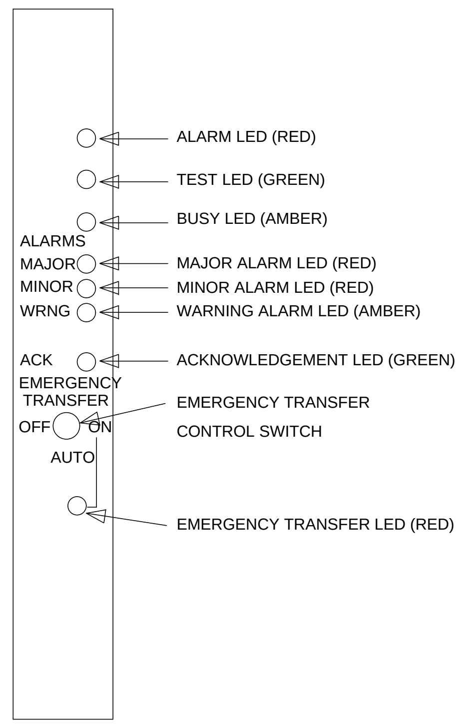


Figure 7-1. Indicators on Maintenance and Processor Circuit Packs

Duplication Interface Circuit Pack LEDs

In a High or Critical Reliability system, there are two Duplication Interface circuit packs. One is located in carrier A and one in carrier B of the PPN. Each circuit pack has two groups of LEDs. The top three have the traditional function of indicating the status of the pack. The LED located at the bottom of the faceplate directly beneath the SPE AUTO switch is labeled OVERRIDE. Under normal operating conditions, the SPE AUTO switch is in the AUTO (center) position (see Figure 7-2). This means that the system controls which SPE is active. However, there will be times (during maintenance activity, for example) when you, the technician, may choose to manually override the SPE selection function. To override system selection of the Active processor, move the SPE Select switches one at a time on *both* Duplication Interface circuit packs from the AUTO position to either the ‘‘A’’ position or the ‘‘B’’ position. Thus, when both SPE Select switches have been moved to either ‘‘A’’ or ‘‘B,’’ the OVERRIDE LED turns red and lights steadily.

NOTE:
Failure to move both SPE Select switches to the same position causes the system to retain control of processor selection.

To return control of the SPE selection to the system, return the SPE Select switches on both Duplication Interface circuit packs to the AUTO position (one at a time to avoid accidentally selecting the other SPE). The OVERRIDE LED goes dark.

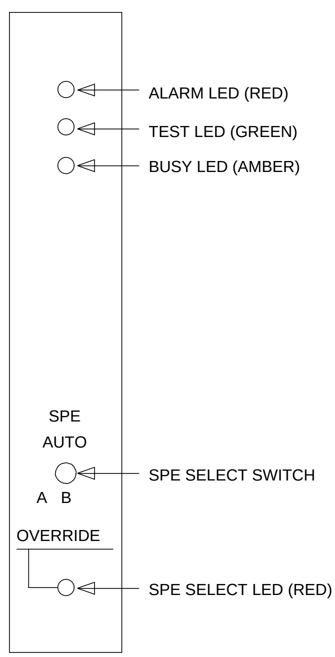


Figure 7-2. Duplication Interface Circuit Pack Indicators

Attendant Console LEDs

The console has two red LEDs, labeled ALM and ACK, on the left side of the dial. The left LED lights steadily when there is a Major or Minor alarm at the switch cabinet. The right LED lights steadily if the alarm has been successfully reported to INADS. If the system is unable to report the alarm to INADS, the LED flashes; this signals the attendant to call INADS and report the alarm.

Carrier Power Unit LEDs

For a description of Carrier Power Unit LEDs, refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" and "CARR-POW (Carrier Port Power Unit) for DC-Powered Systems" Maintenance documentation found in Chapter 11, "Maintenance Object Repair Procedures".

Power Distribution Unit LEDs

For a description of Power Distribution LEDs, refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" and "CARR-POW (Carrier Port Power Unit) for DC-Powered Systems" Maintenance documentation.

Control and Port Circuit Pack Status LEDs

Each circuit pack in the switch cabinet has three LEDs on the front panel visible at the front of the carrier (see Figure 7-3). On all circuit packs, except the TN736 Power Unit, the LEDs indicate the following when lighted:

1. Red (alarm)—If the circuit pack is communicating with the system, the system has detected a fault in this circuit pack. An on-board alarm for this circuit pack is displayed in the Alarm Log.

   The circuit pack also lights on this LED when either the circuit pack has not yet initialized communication with the system or when the circuit pack loses contact with the system and therefore stops functioning (circuit pack is said to be ‘‘in reset’’). In these cases, there may not be an alarm in the Alarm Log. To determine if the red LED is lit because the circuit pack is not in contact with the system, issue the **list configuration board PCSS** command, where PCSS refers to the slot containing this circuit pack. If the system does not detect the circuit pack, this command returns ‘‘Identifier not assigned’’ or ‘‘no board.’’

   If the circuit pack has just been inserted, the system may still be initializing the circuit pack. If, after five minutes, the circuit pack still has not initialized communications with the system, check the Maintenance documentation for this MO for any special instructions (for example, EPN Maintenance circuit pack can stop EXP-INTF circuit pack from initializing). If the Maintenance documentation you consult does not provide the needed information, execute the following four steps:

- Check the Hardware Error Log for TONE-BD and TDM-BUS errors. Issue the **test tdm P** command where P is the port network containing the relevant slot. Refer to "Restarting Nonfunctioning Port Circuit Packs" in Chapter 11, "Maintenance Object Repair Procedures" in the general description of the "TDM-BUS (TDM Bus)" Maintenance documentation section. Issue the **test tone-clock PC** command, where P is the network containing the relevant slot, and C is the carrier containing the relevant slot. Follow appropriate Maintenance documentation sections for any TONE-BD and TDM-BUS errors. If the problem persists, go to the next step.
- Reseat the suspect circuit pack. For instructions on reseating circuit packs, refer to the "Handling Port Circuit Packs" and "Handling Control Circuit Packs" sections in Chapter 5, "Routine Maintenance Procedures".

WARNING:
Reseating some circuit packs may be very destructive (for example, Control Carrier circuit packs.)

Wait five minutes. Then issue the **list configuration board PCSS** command. If the result indicates that the system still has not registered the circuit pack, go to next step.

- Try to insert the circuit pack into a different slot and try to insert a different circuit pack into the suspect slot (provided the maintenance documentation for this circuit pack does not warn against either of these actions).
- If the system seems to be functioning correctly, but the circuit pack does not start communicating with the system, replace the circuit pack.

2. Green (test)—The system is running tests on this circuit pack.
3. Amber/Yellow (busy)—Indicates that the circuit pack is in use.

NOTE:
A port circuit pack also lights its red LED when it performs initialization tests (for example, when the circuit pack is initially inserted into the system). If all initialization tests pass, the red LED is turned off. If any initialization tests fail, the red LED remains lighted and the circuit pack is not placed into service.

Packet circuit packs such as the TN556 ISDN BRI-Line and TN570 Expansion Interface perform extensive initialization tests and light both the red and green LEDs during that testing.

During the various states of operation (start-up testing, normal operation, circuit failure, etc.) circuit pack status LED indications appear as shown in Table 7-1.

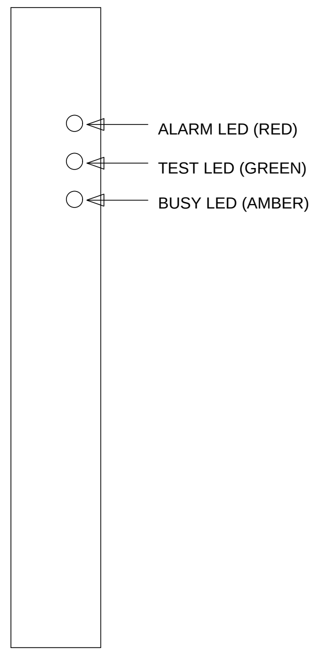


Figure 7-3. Circuit Pack Indicators

Table 7-1. Circuit Pack Status LEDs

Equipment Type	LED	Description
Port Circuit Packs	Red	Lighted briefly during power up, circuit pack reseating, resetting, and system reset. Lighted steadily if circuit pack fails start-up test or fails while in use. Otherwise, dark during normal operation.
	Green	Lighted briefly during circuit pack testing following power up, circuit pack reseating, and system reset. Also lighted during periodic, scheduled, and system technician-demanded testing. Otherwise, dark during normal operation.
	Amber	Lighted steadily when any port in the circuit pack is in use. Otherwise, dark. **NOTE:** The amber LED on the TN771 Maintenance/Test circuit pack may blink. This has special meaning for systems that use the Packet Bus. Refer to Packet Bus Maintenance documentation for more information.
Control Circuit Packs	Red	Lighted briefly during power up and system reset. Lighted steadily if circuit pack fails start-up test or fails while in use. Otherwise, dark during normal operation.
	Green	Lighted briefly during circuit pack testing following power up and system reset. Also lighted during periodic, scheduled, and system technician-demanded testing. Otherwise, dark during normal operation.
Control Circuit Packs *(continued)*	Amber	Network Control —On the TN777B network Control circuit pack, a fourth amber LED with the label ‘‘Card in use’’ is lighted whenever the memory card is in use.

Continued on next page

Table 7-1. Circuit Pack Status LEDs — *Continued*

Equipment Type	LED	Description
Control Circuit Packs *(continued)*	Amber	Processor—Lighted during processor initialization. Lighted steady on the Active SPE and dark during normal operation on the Standby SPE. Memory—Lighted during system initialization (stays lighted until Emergency Transfer is turned off). Lighted steady on the Active SPE and dark during normal operation on the Standby SPE. Network Control—Lighted when one of the data channels is in use. Packet Control —Lighted when at least one Packet Control is in use. Packet Control LEDs do not light up (not even for the *test led* command) if the packet feature is not enabled on the Systems-Parameters Maintenance screen. Tone Detector/Generator—Slow blinking when clock is in use. Otherwise, dark. Processor Interface—Lighted when one (or more) channels (links) is in use. Otherwise, dark. Duplication Interface—Lighted steady on the Active SPE and dark during normal operation on the Standby SPE, with the following exception. Duplication Interface Circuit Pack A has the amber LED lighted steady if Tone/Clock Circuit Pack 1B is active, regardless of which SPE is active and which is standby.
Tape Drive Circuit Pack	Amber	Lighted steadily when the SPE is reading from or writing to the tape. Otherwise, dark.

Reliability Systems: A Maintenance Aid

8

General

A High or Critical Reliability system provides highly-available call processing because single points-of-failure in the system that result in loss of call processing are minimized. Such a system uses the existing duplicated Time Division Multiplex (TDM) Buses, provides the Switch Processing Element (SPE), Tape Unit [286 systems] Memory Card [386 and later systems] , and TN768 and TN780 Tone-Clock circuit pack duplication, and it utilizes Packet Bus redundancy. These components are each single points-of-failure in a Standard Reliability system.

The SPE is fully duplicated. The two SPEs are mounted in separate carriers and are powered by different carrier power supplies. As a result, a High or Critical Reliability system has two control carriers: the A control carrier and the B control carrier (also known as carrier A and carrier B, respectively).

Since the circuit packs in the two SPEs are the same, the SPEs have identical capabilities. Either SPE can act as the Active SPE. However, only one of the SPEs can be the Active SPE at any given time. The Active SPE performs the same operations that the single SPE performs in a Standard system; that is, all call processing, administration, and maintenance activities being performed by the switch. All memory writes performed on the Active SPE are shadowed to the other SPE. The other SPE is known as the Standby SPE. Its role is to take over as the Active SPE if the current Active SPE fails. If the Active SPE (or a component of the Active SPE) fails, the system automatically switches to the Standby SPE.

Under normal conditions, the system operates using both TDM Buses. If the system detects transmission problems on one of the buses, it takes that bus out-of-service and operates with only one bus. This action results in a reduction in capacity. However, if the system detects a problem with one of the Tone-Clock circuit packs, it is able to take that circuit pack out-of-service without any impact on system capacity or performance.

The Packet Bus is NOT duplicated in the same way that the TDM Bus is duplicated (that is, there is one Packet Bus, while there are two TDM Buses). However, there are several spare leads on the Packet Bus itself that are not normally used. In a High or Critical Reliability system, the TN771 Maintenance/Test circuit pack is provided. This circuit pack has ability to detect faulty Packet Bus leads and to instruct all Packet circuit packs (for example ISDN-BRI, Packet Control, TN570 Expansion Interface circuit packs) to use up to three spare leads in place of defective ones.

The rest of this chapter provides a detailed description of the High and Critical Reliability systems that are available in as well as of the Standard system that is available across the board. The chapter explains the duplicated hardware and includes a description of the TN772 Duplication Interface circuit pack. It provides a look at the following concepts relevant to High and Critical Reliability systems: memory shadowing, SPE modes, and SPE-interchanges.

In addition, this chapter contains technical descriptions important to the general maintenance of High and Critical Reliability systems, such as a list of the appropriate system technician commands, SPE circuit pack LED strategies, installation and replacement procedures for SPE Control Carrier circuit packs, and for the Inter-Carrier Cable (ICC).

This chapter uses the term "Standard Reliability system" or "Standard system" to denote a system without duplication.

Reliability Options

The G3i or Release 5 systems or available in three different reliability options: Standard, High and Critical Reliability. An increased level of reliability is implemented by duplicating various components so that standby components can take over (interchange) when a failure occurs on an active component. Most interchanges take place with no disruption of current service, and they allow for repairs to be made without disruption. Furthermore, duplication allows for the upgrading and maintenance of duplicated components and software without service disruption. The following sections describe which components are duplicated with each option.

Standard Reliability

On Standard Reliability systems, the 512-time-slot TDM bus is divided into two duplicate 256-time-slot buses, A and B. Call traffic is shared between the two buses. The first five time slots on each bus are reserved for the control channel, which is active on only one of the two buses at a time. Likewise, the next 17 time slots are reserved for carrying system tones. The tone time slots are not necessarily on the same bus (A or B) as the control channel. If any failure that affects the ability of the active control channel or the tone time slots to function takes place, the other bus becomes active for those time slots. For more information, see TDM-BUS Maintenance section in Chapter 11, "Maintenance Object Repair Procedures", and the **set tdm** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

High Reliability

High Reliability systems duplicate components that are critical to the viability of the system as a whole to prevent a single failure from dropping all service. These components include the following:

- PPN control carrier and carrier power units (OLSs)
- All SPE circuit packs, including the Processor, Memory, Network Controller, Tape [286 Systems], Memory Card [386 Systems], Processor Interface, Packet Controller, and Duplication Interface circuit packs
- PPN Tone Clock circuit pack (EPN Tone-Clocks are not duplicated)
- TDM buses (described in the previous section)

The duplicated SPEs operate in active/standby fashion. Operation of this duplication is described in the STBY-SPE and DUPINT MO sections in Chapter 11, "Maintenance Object Repair Procedures". Interchanges of the SPE and of PPN Tone-Clocks operate independently unless induced by use of the SPE-select switches.

Critical Reliability

Critical Reliability systems include all of the features of the High Reliability option described in the previous section. Additionally, these systems duplicate components of Port Network Connectivity (PNC) and of other components that are critical to the viability of each EPN. These components include the following:

- PPN and EPN Tone-Clock circuit packs
- PPN and EPN Expansion Interface circuit packs
- Inter-PN cabling

The entire direct-connected fiber connectivity is duplicated between each pair of port networks. Each duplicated fiber pair operates in an active/standby manner with all inter-PN calls set up on both fibers so that the active SPE can assume control without disruption of service. Each fiber pair between a pair of port networks operates independently of the other fiber pairs with respect to the active/standby operation (that is, the A-carrier fiber can be active between the PPN and EPN 1, and the B-carrier fiber can be active between the PPN and EPN 2).

The Tone-Clocks in each EPN operate in an active/standby manner independently from other duplication strategies.

Duplicated Hardware

A description of the hardware components used in a High or Critical Reliability system follows.

SPE Duplication

Each SPE in a High or Critical Reliability system consists of the following circuit packs:

- Processor Circuit Pack (TN773 [286 system] or TN786B [386 system])
- Memory Circuit Packs (2) (TN770 [286 system])
- Memory Expansion Board (CPP1 [386 system])
- Network Control Circuit Pack (TN777[B])
- Packet Control Circuit Pack (TN778)

NOTE:
There may be zero or one Packet Control circuit packs. However, both SPEs must have an equal number of circuit packs.

- Processor Interface Circuit Pack(s) (TN765)

  NOTE:
  In a multicarrier cabinet, there may be zero, one, or two Processor Interface circuit pack(s). In a single-carrier cabinet, there may be zero or one Processor Interface circuit pack(s). However, both SPEs must have an equal number of Processor Interface circuit packs.

- Tape Unit (TN774 [286 system])
- Duplication Interface Circuit Pack (TN772)

Duplication Interface Circuit Pack

The Duplication Interface circuit pack is required to support SPE duplication. Duplication Interface A is part of the SPE in the A control carrier, and Duplication Interface B is part of the SPE in the B control carrier.

The Duplication Interface circuit packs provide a broad range of functionality. Alone, Duplication Interface A provides control of the following components: the duplicated Processor circuit packs, the duplicated Tone-Clock circuit packs, the environmental maintenance monitoring and control, and G3MT terminal connection. Together, Duplication Interface A and Duplication Interface B provide memory shadowing from Active SPE Memory to Standby SPE Memory and communication between software on the Active SPE and the Standby SPE.

Duplication Interface A controls a lead that indicates to the duplicated Processor and Network Control circuit packs, respectively, which SPE is currently the Active SPE. This lead is known as the SPE Select lead. Duplication Interface A controls another set of leads that indicate to the duplicated TN768 and TN780 8

Tone-Clock circuit packs which of the two is currently the active one. These leads are known as the Tone-Clock Select leads. System software can request that the SPE Select lead and/or the Tone-Clock Select leads be changed. Duplication Interface A controls and monitors in the PPN of a High or Critical Reliability system the same set of environmental leads that the EPN TN775 or TN775B Maintenance circuit pack controls and monitors in an EPN.

The Duplication Interface circuit packs communicate with one another over the Inter-Carrier Cable (ICC). In a multicarrier cabinet, the ICC physically consists of two 25-pin connector cables known as ICC-A and ICC-B. In a single-carrier cabinet, the ICC physically consists of three 25-pin connector cables known as ICC-A, ICC-B, and ICC-C. The ICC connects the Duplication Interface circuit packs via pin fields on the backplane. The pin fields where ICC-A and ICC-B (and ICC-C in a single-carrier cabinet) are connected are labeled on the backplane near the pin fields for the Duplication Interface circuit packs. The ICC carries leads related to maintaining a High or Critical Reliability system. Furthermore, without the ICC properly attached, the system cannot function as either a High or Critical Reliability system or as a Standard system.

The Duplication Interface circuit packs support serial links that provide for G3 MT connection, memory shadowing from Active SPE Memory to Standby SPE Memory, and communication between software on the Active SPE and the Standby SPE. Four serial links are supported:

1. The serial link from Duplication Interface A to the G3 MT.
2. The serial link from Duplication Interface A to the Maintenance/Tape Processor in carrier A.
3. The serial link from Duplication Interface A to the Maintenance/Tape Processor in carrier B.
4. The serial link from Duplication Interface A to Duplication Interface B.

NOTE:
The Duplication Interface B circuit pack does not communicate directly with either Maintenance/Tape Processor or with the G3MT.

Duplication Interface A supports the serial channel to the G3MT that is connected to the Duplication Interface A circuit pack via a connector on the back of carrier A labeled "DOT" (Duplication Option Terminal). If the Duplication Interface A circuit pack becomes defective, and the B carrier becomes the Active SPE, the terminal can be connected to the Maintenance/Tape Processor in carrier B by connecting the terminal to the connector labeled "TERM" on the back of carrier B. If the Duplication Interface A circuit pack becomes defective and carrier A becomes the Active SPE, the terminal can be connected to the Maintenance/Tape Processor in carrier A by connecting the terminal to the connector labeled "TERM" on the back of carrier A.

Communication between software on the Active SPE and the Standby SPE is conducted via a message flow between the two Processors. The flow of messages from the Processor in carrier A to the Processor in carrier B is as follows: Processor A to Maintenance/Tape Processor A over the serial link to Duplication Interface A over the serial link to Maintenance/Tape Processor B to Processor B. The flow in the reverse direction is exactly opposite.

The serial link between Duplication Interface A and Duplication Interface B is involved only in memory shadowing from the Active SPE to the Standby SPE as described in the "Memory Shadowing" section.

SPE Select Switches

The SPE-SELEC (SPE Select) switches are located on the TN772 Duplication Interface circuit packs and are used to hard-select the Active SPE in a High or Critical Reliability system. "Hard-select" means that the SPE Select switches can be moved from the AUTO position to force the current Active SPE to remain the Active SPE or to force the current Standby SPE to become the Active SPE. Hard selection of the Active SPE using the SPE Select switches overrides any attempts by the system software to switch to the Standby SPE to make it become the Active SPE.

Each switch has three positions:

- SPE-A (the left position)
- AUTO (the middle position)
- SPE-B (the right position)

To hard-select SPE A as the Active SPE, *both* SPE Select switches must be moved **one at a time** to the SPE-A position. To hard-select SPE-B as the Active SPE, *both* SPE Select switches must be moved to the SPE-B position. Any other combination of SPE Select switches leave control of the Active SPE to the system software.

Inter-Carrier Cable

As described previously, the ICC connects the two TN772 Duplication Interface circuit packs and is a basis of support for the Duplication Interface circuit pack functionality described previously.

The ICC carries leads related to maintaining a High or Critical Reliability system. The SPE Select lead indicates which SPE is the Active SPE. The Tone-Clock Select leads indicate which Tone-Clock circuit pack is active. SPE Select switch state leads indicate the position of the SPE Select switches. Emergency Transfer leads indicate whether Emergency Transfer is on or off in the PPN cabinet. Other leads "combine" the INADS, CDR, and the Customer-Provided Alarming device channels from the two Maintenance/Tape Processors.

The ICC also carries an indication of whether memory shadowing is enabled or disabled. Information to be shadowed is sent over the serial link between Duplication Interface B and Duplication Interface A; this serial link is carried over the ICC.

Communication between software on the Active SPE and the Standby SPE is sent over the serial link between Duplication Interface A and the Maintenance/Tape Processor in carrier B. This serial link is also carried over the ICC.

The presence of the ICC also causes ID pins on the backplane to indicate that the system is a High or Critical Reliability system rather than a Standard Reliability system.

The ICC is difficult to connect, and its proper connection is critical to the operation of the system. Refer to the "Procedure for Installing/Replacing the Inter-Carrier Cable" section for details on how to properly connect the ICC.

Tone-Clock Circuit Pack Duplication

For more information about the Tone-Clock circuit packs see TONE-BD Maintenance Object in Chapter 11, "Maintenance Object Repair Procedures".

The TONE-BD (Tone-Clock) MO functionality is made up of the TONE-PT (Tone Generator) and the TDM-CLK (TDM Bus Clock). The Tone Generator provides all tones required by the system; the TDM Bus Clock provides synchronization for the TDM Bus and aids in monitoring and selection of SYNC (Synchronization) references.

Each High or Critical Reliability system provides two Tone-Clock circuit packs. In this configuration, a failed Tone-Clock circuit pack is switched off-line and an operational circuit pack is put on-line. Duplication Interface A selects the Active Tone-Clock circuit pack by driving the Tone-Clock Select lead. The selection of the Active Tone-Clock circuit pack is independent of the selection of the Active SPE.

Time Division Multiplexed Bus Duplication

The TDM Bus is composed of two separate, independent buses called bus A and bus B. The first five time slots of both buses are reserved for communication between the SPE and port circuit packs. These time slots are known as the control channel. The control channel is a vital component and must be operational for the system to provide meaningful customer voice and data services. In addition to the control channel time slots, several other time slots are reserved for system use. These additional time slots are for the standard tones. The standard tones include the dial tone and the touch tones.

The ability to move the control channel and tones from a defective TDM Bus to an operational TDM Bus is a key component of a highly-available system. The system can detect transmission errors on the control channel, errors can be diagnosed, and corrective actions can be taken when necessary. If a bus is found to be defective, it is taken out-of-service. All existing calls on the out-of-service bus are maintained, but no new calls are assigned to the out-of-service bus.

In addition to the system software’s ability to detect a defective bus and perform a TDM Bus switch, the user also has the ability to specify if and when a scheduled control channel switch is to be performed.

Figure 8-1 shows the communication path between the Active SPE and the Standby SPE in a 286 system, and Figure 8-2 shows the same in a 386 system. These figures show the duplicated SPE (and all SPE circuit packs) and the duplicated TN768 (and TN780) Tone-Clock circuit packs. The TN772 Duplication Interface circuit packs are shown in these figures. The dotted lines depict the serial connections supported by the Duplication Interface circuit packs as described previously. The SPE Select and Tone-Clock Select leads are shown. Finally, the ICC is shown as it physically appears on the system, that is, as two 25-pin cables called ICC-A and ICC-B in a multicarrier cabinet and three 25-pin cables called ICC-A, ICC-B, and ICC-C in a single-carrier cabinet. The high-level functionality that the ICC provides is also depicted in the figures.

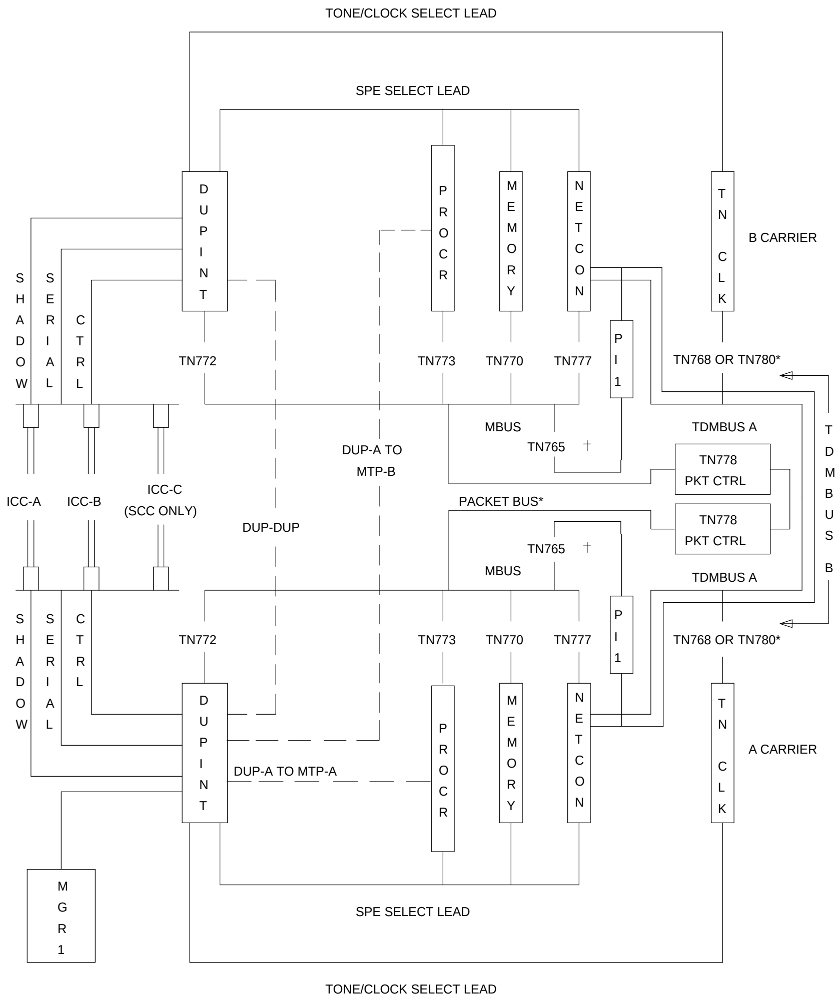
These figure may also be useful when reading the following "Duplication Concepts" section.

Packet Bus Redundancy

The Packet Bus is used to provide ISDN-BRI signaling via the TN778 Packet Control circuit pack. The Packet Bus is not physically duplicated in the same way that the TDM Bus is duplicated. However, there are several spare leads on the Packet Bus itself that are not normally used. In a High or Critical Reliability system that is using the Packet Bus, a TN771 Maintenance/Test circuit pack is provided for each port network. The Maintenance/Test circuit pack has the ability to test the Packet Bus and discover shorted or open leads on the Packet Bus. When such a fault is discovered, the Maintenance/Test circuit pack sends a message to each circuit pack that uses the Packet Bus, instructing that circuit pack to use one of the spare leads in place of the defective lead.

The Maintenance/Test circuit pack can recover up to three Packet Bus lead failures via this mechanism. This provides high availability by decreasing the chance of a blocking Packet Bus fault by two orders of magnitude.

The Maintenance/Test circuit pack has other capabilities, primarily with respect to ISDN-PRI Test Call features. Because of these other capabilities, the Maintenance/Test circuit pack is available as an option in Standard Reliability systems or in High and Critical Reliability systems that are not using the Packet Bus. In such systems, the Packet Bus redundancy capabilities of the Maintenance/Test circuit pack are NOT enabled.



* G1.2 ONLY.

† MCC ONLY.

(IN A SINGLE-CARRIER CABINET CONFIGURATION, THERE CAN BE EITHER 0 or 1 PROCESSOR INTERFACE CIRCUIT PACK. IN A MULTI-CARRIER CABINET CONFIGURATION, THERE CAN BE 0, 1, OR 2 PROCESSOR INTERFACE CIRCUIT PACKS.)

Figure 8-1. Communication Between Active SPE and Standby SPE [286 Systems]

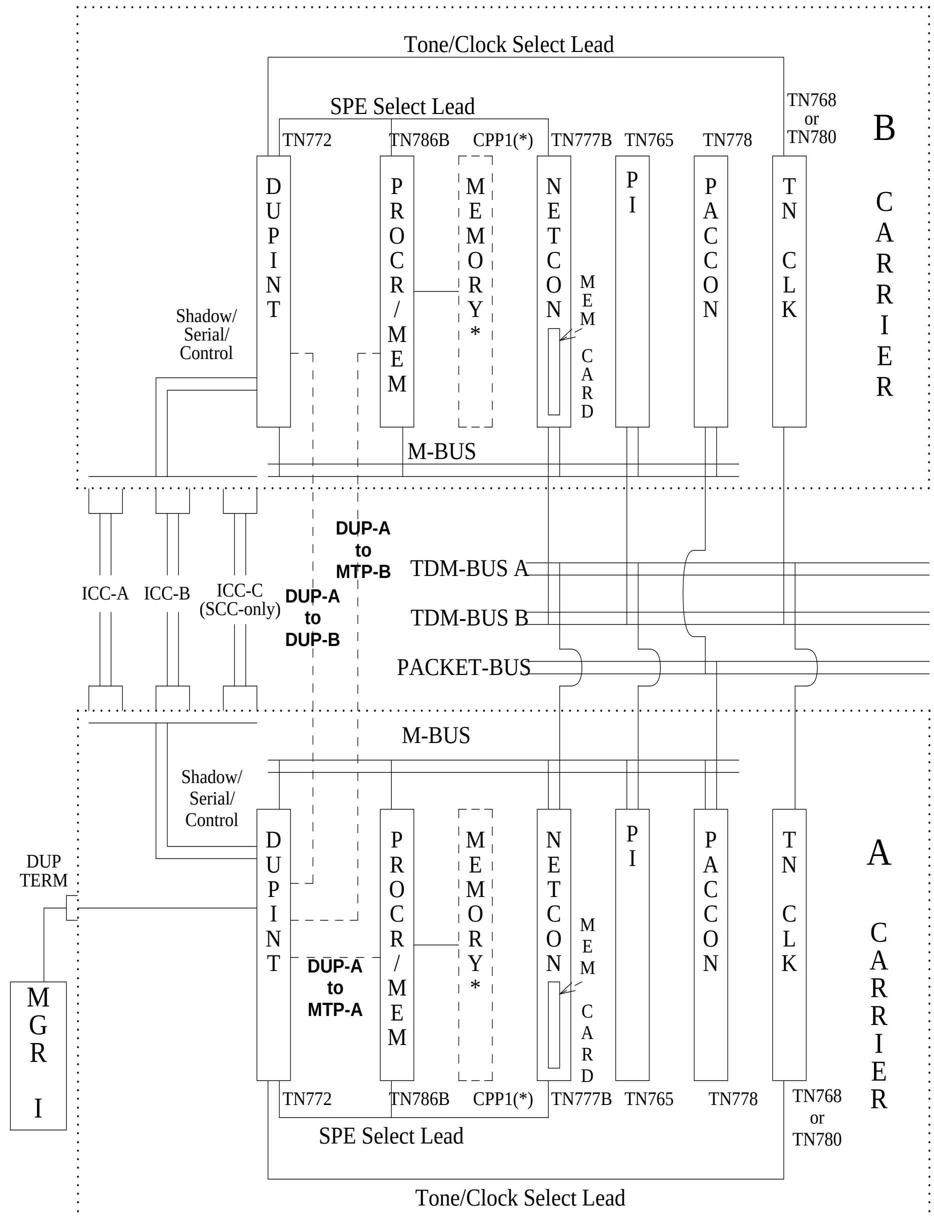


Figure 8-2. Communication Between Active SPE and Standby SPE [386 Systems]

Duplication Concepts

High and Critical Reliability systems employ several concepts of duplication. These are described in the following sections.

Memory Shadowing

Most of the time the Standby SPE is in a mode known as Standby Mode (see "SPE Modes" section) in which it is ready to assume the role of the Active SPE. To be ready to assume the role of the Active SPE, Standby SPE MEM-BD 286, MEMORY-386, and PR-MEM Release 5vs/si and later must be an up-to-date reflection of Active SPE Memory. This is accomplished via the memory shadowing mechanism.

The SHDW-CIR (Common Shadow Circuitry) on the Active SPE TN772 DUPINT (Duplication Interface) detects all memory writes that the Active SPE PROCR (Processor) makes to Active SPE Memory. The Active SPE Common Shadow Circuitry sends this information to the Common Shadow Circuitry on the Standby SPE Duplication Interface via the ICC. The Common Shadow Circuitry on the Standby SPE Duplication Interface then writes the data to Standby SPE Memory. This logical connection between Active SPE Memory and Standby SPE Memory is known as the SHDW-LNK (Memory Shadowing Link).

Although most of the components making up the Memory Shadowing Link (that is, Active SPE Memory, both sets of Common Shadow Circuitry, and Standby SPE Memory) are tested and maintained individually, the integrity of the entire logical connection is also tested and maintained to make sure that the shadowing mechanism is functional and that Standby SPE Memory is the same as Active SPE Memory. Therefore, this testing is done under the guise of the Memory Shadowing Link.

SPE Modes

As described earlier, the Active SPE is the SPE that is currently responsible for all call processing, administration, and maintenance activities being performed by the switch. The Active SPE is always in Active Mode.

The role of the Standby SPE is to be ready to take over as the Active SPE in the event that the current Active SPE fails. The Standby SPE does not perform Call Processing or Administration activities. It does perform Maintenance activity, but this is carried out completely under the direction of the Active SPE in order to monitor and maintain the health of the Standby SPE.

The Standby SPE is always in one of three modes: Standby, Maintenance, Busyout, or Down. Usually the Standby SPE is in Standby Mode. In this mode, the SW-CTL (Switch Control) on the Standby SPE Network Control circuit pack is isolated from the TDM Bus so that it does not attempt to control the bus and interfere with the Switch Control on the Active SPE Network Control circuit pack.

Similarly, the Standby SPE Packet Control circuit pack is isolated from the Packet Bus so that it does not attempt to control the Packet bus, and thus interfere with the Active SPE Packet Control circuit pack. The Standby SPE PROCR (Processor) is held in a reset state so that it does not run software. Finally, Standby SPE is being shadowed into from Active SPE Memory—meaning that Standby SPE Memory is updated to reflect every change in Active SPE Memory (for example, calls and administration changes). In Standby Mode, the Standby SPE is available to assume the role of the Active SPE.

In certain circumstances, the Standby SPE is put into Maintenance Mode by the Active SPE. In this mode, the Standby SPE is still isolated from the TDM and Packet Buses, but is no longer having its Memory shadowed into; its Processor is no longer held in a reset state. In Maintenance Mode, the Standby SPE accepts maintenance activity requests from the Active SPE to perform testing on Standby SPE components. For many of the requested activities, system software on the Standby SPE is brought up to conduct the activity. Translation saves and announcement saves may be performed on the Standby SPE when it is in Maintenance Mode. While in Maintenance Mode, the Standby SPE is not as readily available to assume the role of the Active SPE, but may do so depending on the severity of the Active SPE fault(s).

In Busyout Mode, the Standby SPE is busied out via the *busyout SPE-standby* command. Only system technician-requested activities are carried out on the Standby SPE until a *release SPE-standby* command is executed. Refer to the **status system** command in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for information concerning Standby Modes.

Whenever the Standby SPE is returned to Standby Mode from Maintenance Mode, its Memory is refreshed.

NOTE:
Verify that the Standby SPE is functional (no duplication alarms exist and the SPE has returned to the Standby Mode) by running the **status system 1** command. If the standby SPE is in the maint/idle mode with no standby alarms, use the **standby refresh** command to put the standby SPE into the standby mode. Verify the results by using the **status system 1** command. For more information about the **status system** command see Chapter 10 .

NOTE:
The system software automatically returns the Standby SPE from Maintenance Mode to Standby Mode at the completion of any maintenance activity. However, it is also possible to force the Standby SPE to return to Standby Mode by issuing the **refresh spe-standby** command from the G3MT terminal. The **refresh spe-standby** command preempts Standby SPE Maintenance Mode except that of entering maintenance mode. See the "System Technician Commands for High and Critical Reliability Systems" section for a description of the **refresh spe-standby** command.

This means that all of Active SPE DRAM Memory is shadowed over into Standby SPE Memory. The refresh is necessary because, while in Maintenance Mode, memory shadowing to the Standby SPE is disabled, and Standby SPE Memory is not updated to reflect changes in Active SPE Memory. After the refresh, Standby SPE Memory is again an up-to-date reflection of Active SPE Memory.

The Standby SPE goes into Down Mode when certain error conditions are detected. These error conditions are described in detail in the "Hardware Error Log Entries and Test to Clear Values" section of STBY-SPE (Standby SPE) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures". Once the error condition(s) that caused the Standby SPE to go into Down Mode is (are) corrected, the Standby SPE is first put into Maintenance Mode to conduct testing on Standby SPE components and is then returned to Standby Mode.

The current mode of the Standby SPE can be determined by issuing the **status system** command.

SPE-Interchanges

The process by which the Standby SPE takes over for the Active SPE is referred to as an SPE-interchange. There are six conditions under which an SPE-interchange is initiated:

- Upgrade Software

  Issuing the **upgrade software** command to upgrade the software on a High or Critical Reliability system reboots the Standby SPE from the standby tape [286 systems] or memory card [386 or later systems] and then invokes an SPE-interchange so that the system is now running on the new software.

- System Technician Command

  Issuing the **reset system interchange** command on the G3MT terminal causes an SPE-interchange to be initiated.

- Alarm Condition

  If a Major or Minor alarm is activated on any circuit pack, an SPE-interchange is initiated, provided the health of the Standby SPE is better than that of the Active SPE. Table 8-1 lists the MOs, the alarm levels, the level of SPE-interchange initiated, and the severity given to the alarm for all MOs that can cause software requested SPE-interchanges. The health of an SPE is based upon the single most severe alarm active within that SPE. The higher the severity level, the more severe the problem. The restart level of the interchange also depends on the single most severe alarm within the active SPE. Hot Restarts occur only when the Standby SPE is in standby mode. For example, the active SPE has a MAJOR SHDW-CIR and a MINOR DATA-BD alarm, and the standby SPE has a MAJOR TAPE alarm. In this case, the severity level of the active is 60, the severity level of the standby is 65, and no SPE-interchange would occur.

- SPE Select Switches

  An SPE-interchange can be initiated by moving both SPE Select Switches, **one at a time**, to the position that selects the Standby SPE for Active Mode. The SPE Select Switches were described earlier in this chapter.

- Scheduled Maintenance

  An SPE-interchange can be requested as a part of scheduled maintenance. This mechanism is used to exercise both SPEs. An SPE-interchange can be requested as part of scheduled maintenance by issuing the **change system-parameters maintenance** command and updating the form.

- Processor Insanity

  Duplication Interface A (DUPINT, TN772) periodically audits the sanity of each of the Processor circuit packs. If the Active SPE does not respond to the sanity audit, Duplication Interface A initiates an SPE-interchange.

Table 8-1. Software-Requested Interchanges Caused by Alarm Conditions

Maintenance Object	Alarm Level	On/Off Board	Fault Severity Level	Restart Level
STBY-SPE	WARNING	OFF	120	None
MEM-BD	MAJOR or MINOR	ON	110	Hot or Warm[1]
MEMORY	MAJOR or MINOR	ON	110	Hot or Warm[1]
STBY-SPE	MAJOR	ON	100	None
PROCR	MAJOR	ON	70	Hot or Warm[1]
SW-CTL	MAJOR	ON	65	Cold 2
TAPE	MAJOR	OFF	65	Cold 1
MEM-CARD	MAJOR	OFF	65	Cold 1
12V-PWR	MIN	ON	65	Hot
DUPINT	MAJOR	ON	61	Hot
CARR-POW	MAJOR	ON	61	Cold 2
SHDW-CIR	MAJOR	ON or OFF	60	Warm
SHDW-LINK	MAJOR	ON	60	Warm
SW-CTL	MINOR	ON	40	Hot
PR-MAINT	MINOR	ON	30	Hot
PI-BD	MAJOR or MINOR	ON	20	Hot
PKT-CTRL	MAJOR	ON or OFF	20	Hot
PKT-CTRL	MINOR	ON or OFF	15	Hot
PI-PT	MAJOR	ON	15	Hot
DATA-CHL	MINOR	ON	15	Hot
DATA-CON	MINOR	ON	15	Hot
DATA-BD	MINOR	ON	15	Hot
TAPE	MINOR	ON or OFF	10	Hot
CARD-MEM	MINOR	ON or OFF	10	Hot
PR-MAINT	MINOR	OFF	8	Hot

1 If the Standby SPE is in Standby mode when the alarm occurs, a Hot SPE-Interchange occurs. If the Standby is in Maintenance mode when the alarm occurs, however, a Warm SPE-Interchange rather than a Hot SPE-Interchange occurs.

Regardless of the condition that initiates an SPE-interchange, the G3MT is always logged off as a result of the SPE-interchange. The G3MT is available to log into after the SPE-interchange is complete and the "login" prompt is displayed.

System Technician Commands for High and Critical Reliability Systems

The following system technician commands support High and Critical Reliability systems. Complete descriptions of all these commands can be found in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

Commands for SPE Duplication

- The **busyout SPE-standby** command stops all background maintenance activities on the Standby SPE, and it doubles memory shadowing.
- The **release SPE-standby** command refreshes the Standby SPE, and it allows all background standby maintenance activities to continue.
- The **status system** command displays the status of the Active SPE and the Standby SPE (among other information).

  NOTE:
  Verify that the Standby SPE is functional (no duplication alarms exist and the SPE has returned to the Standby Mode) by running the **status system 1** command. If the standby SPE is in the maint/idle mode with no standby alarms, use the **standby refresh** command to put the standby SPE into the standby mode. Verify the results by using the **status system 1** command. For more information about the **status system** command see Chapter 10.

- The **status mem-card [0[1]] a|b** command displays the status of the Active SPE Memory Card or the status of the Standby SPE Memory Card [G3iV2-386].
- The **test processor [0[1]] a | b [short | long]** command tests the specified Processor circuit pack (which includes memory in a 386 or later System).
- The **test memory [0[1]] a | b [short | long]** command tests either the specified TN770 Memory circuit packs [286] or the on circuit pack memory with an optional Memory Expansion circuit pack [386].
- The **test card-mem [0[1]] a | b [short | long]** command tests either the Active SPE Memory Card or the Standby SPE Memory Card [386 or later system].
- The **test network-control [0[1]] a | b [short | long]** command tests the specified TN777[B] Network Control circuit pack and the Memory Card [G3iV2-386].

- The **test packet-control [0[1]] a | b [short | long]** command tests the specified TN778 Packet Control circuit pack.
- The **test interface [0[1]] a1 | b1 [short | long]** command tests the specified first TN765 Processor Interface circuit pack.
- The **test interface [0[1]] a2 | b2 [short | long]** command tests the specified second TN765 Processor Interface circuit pack.
- The **test tape [0[1]] a | b [short | long]** command tests the specified TN774 Tape Unit [286].
- The **test duplication-interface [0[1]] a | b [short | long]** command tests the specified TN772 Duplication Interface circuit pack.
- The **test shadow-link** command tests the SHDW-LINK (Memory Shadowing Link). Refer to the "MEM-BD (Memory circuit pack)" Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", for a detailed description of this command.
- The **set vector <level> [spe-active | spe-standby | spe-maint]** command requests that a core dump be taken when a system restart of level **<level>** occurs.
- The **reset system interchange** command requests an SPE-interchange.
- The **test spe-standby [short | long]** command tests the Processor, Memory, Network Control, Processor Interface, Duplication Interface, and Tape Unit [286 system] or Memory Card [386 or later system] circuit packs in the control carrier containing the Standby SPE. Refer to the "STBY-SPE (Standby SPE)" Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", for a detailed description of this command.
- The **refresh spe-standby** puts the Standby SPE into Standby mode.

CAUTION:
Because of the power of the "refresh spe-standby" command, its full impact is described here so that it is clearly understood.

The **refresh spe-standby** command is used to immediately put the Standby SPE into Standby Mode. The command conducts the same activities regardless of whether the Standby SPE is already in Standby Mode or whether it is in Maintenance Mode. When this command is issued, most Standby SPE maintenance activity that is currently in progress is preempted, the Standby SPE Processor is held reset, and the Standby SPE Memory is refreshed (that is, all of Active SPE DRAM Memory is shadowed to Standby SPE Memory). Recall that the refresh is necessary because, while the Standby SPE is in Maintenance Mode, memory shadowing is disabled. When the Standby SPE is returned to Standby Mode, its Memory must be brought up-to-date with Active SPE Memory. If the system was trying to enter Maintenance Mode, the **refresh spe-standby** command aborts with the message, "Cannot interrupt Standby SPE while entering maintenance mode; please try later."

WARNING:
Because of its power to preempt Standby SPE maintenance activities, the "refresh spe-standby" command should be used judiciously. If the Standby SPE is in Maintenance Mode when the "refresh spe-standby" command is issued, the maintenance activity that is being conducted by the Standby SPE is immediately terminated.

The following side-effects may occur:

- Testing of the Standby SPE components that are the target of the maintenance activity may not have completed. Depending on the maintenance activity and the point at which it is terminated, tests that detect faults and/or lack of faults on those Standby SPE components may not have had the opportunity to run. Accordingly, alarms are not raised or retired on the components.
- If the maintenance activity is scheduled maintenance, and if the **refresh spe-standby** command is issued before a scheduled translation save is performed, the translation save is not done, and the translation data on both the Active SPE and Standby SPE tapes or memory cards do not reflect changes made since the last translation save.

In general, after a **refresh spe-standby** command has been used and the user has finished working with the system, the **test spe-standby long** command should be issued if the **refresh spe-standby** command preempted a Standby SPE maintenance activity.

Additionally, if the **refresh spe-standby** command was used in the time frame in which scheduled maintenance with a translation save was to have been conducted, the **save translation** command should be issued to ensure that the current translation data has been written to the Active SPE and Standby SPE tapes or Memory Cards. When using the **refresh spe-standby** command to preempt Standby SPE maintenance activities, it may be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the G3MT terminal message "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.

Commands for TDM Bus Duplication

- The **status system** command displays the bus on which the control channel and tones currently reside (among other information).
- The **test tdm port-network [1 | 2 | 3] [short | long]** command tests both TDM Buses.
- The **set tdm port-network [1 | 2 | 3] a | b [override]** command moves the control channel and dedicated tones to the specified TDM Bus.
- The **busyout tdm port-network [1 | 2 3] bus a | b** command places the specified bus in a maintenance busy state.
- The **release tdm port-network [1 | 2 3] bus a | b** command places a busied-out bus back in service.

Commands for Packet Bus Redundancy

- The **status system** command displays the status of the Packet Bus, and the number of faulty and open leads that the Maintenance/Test circuit pack has found.
- The **test pkt port-network [1 | 2 | 3]** command tests the Packet Bus.

Commands for Tone-Clock Circuit Pack Duplication

- The **status system** command displays the Tone-Clock circuit pack that is currently supplying tones and clocks (among other information).
- The **test tone-clock [1 | 2 |3] a | b [short | long]** command tests the specified TN768 Tone-Clock circuit pack.
- The **set tone-clock [1 | 2 |3] a | b [override]** command makes the specified Tone-Clock circuit pack active.
- The **busyout tone-clock [1 | 2 |3] a | b** command places the specified Tone-Clock circuit pack in the maintenance busy state.

  NOTE:
  This cannot be the one that is currently active.

- The **release tone-clock [1 | 2 |3] a | b** command removes the specified Tone-Clock circuit pack from the maintenance busy state.

Processor Complex Circuit Pack LED Strategies

The LEDs (light-emitting diodes) on the circuit packs in the two SPEs have the following meanings:

- Processor Circuit Pack (TN773 [286 Systems] or TN786B [386 Systems] or TN790 Release 5 systems):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on/Green-off: SPE in Active Mode

  — Amber-on/Green-on: SPE in Active Mode; PROCR (Processor circuit pack), PR-MAINT (Maintenance/Tape Processor), or TAPE (Tape) maintenance running [286 Systems] or PROCR, PR-MAINT, or MEMORY [386 Systems]

  — Amber-off/Green-on: SPE in Maintenance Mode or Memory is not refreshed

  — Amber-off/Green-off: SPE in Standby Mode; Memory is refreshed

  — Red-on: fault on Processor circuit pack (PROCR, PR-MAINT, or TAPE) [286 Systems] or (PROCR, PR-MAINT, or MEMORY) [386 Systems], or PR-MEM [Release 5vs/si and later systems]

  In addition to the standard LEDs, the Processor circuit pack has the red major and minor alarm LEDs, an amber warning LED, a green ack LED, and a red Emergency Transfer LED.

- Memory Circuit Pack (TN770) or Memory Expansion (CPP1):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: SPE in Active Mode

  — Amber-off: SPE in Standby Mode

  — Green-on: maintenance running on Memory circuit pack

  — Red-on: fault on Memory circuit pack

- Duplication Interface Circuit Pack (B carrier) (TN772):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: SPE in Active Mode

  — Green-on: maintenance running on Duplication Interface circuit pack

  — Red-on: fault on Duplication Interface circuit pack

- Duplication Interface Circuit Pack (A carrier) (TN772):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: SPE in Active Mode or A carrier Tone-Clock circuit pack active

  — Green-on: maintenance running on Duplication Interface circuit pack

  — Red-on: fault on Duplication Interface circuit pack

  Each Duplication Interface circuit pack has another red LED associated with the SPE Select Switch. The purpose of the red switch LED is to serve as a reminder that an SPE is being forced to be the Active SPE and, therefore, the system is not duplicated. Both SPE Select Switch LEDs (one on each Duplication Interface circuit pack) are on when an SPE is being forced to be the Active SPE by the consistent positions of the two SPE Select Switches. Both LEDs are extinguished when the SPE Select Switch positions are inconsistent or when both SPE Select Switches are in the position. In the latter two cases, the Active SPE is automatically selected by the system software.

- Processor Interface Circuit Pack (TN765):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: link terminated at Processor Interface circuit pack

  — Green-on: maintenance running on Processor Interface circuit pack

  — Red-on: fault on Processor Interface circuit pack

- Network Control Circuit Pack (TN777[B]):

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: link terminated at Network Control circuit pack

  — Green-on: maintenance running on Network Control circuit pack

  — Red-on: fault on Network Control circuit pack

  — Amber-on: (below Memory Card slot) Memory Card in use

- Packet Control Circuit Pack (TN778)

  The use of the standard amber/green/red LEDs is as follows:

  — Amber-on: link terminated at Packet Control circuit pack

  — Green-on: maintenance running on Packet Control circuit pack

  — Red-on: fault on Packet Control circuit pack

- Tone-Clock Circuit Pack:

  NOTE:
  For information on the standard amber/green/red LEDs see TONE-BD Maintenance Object in Chapter 11, "Maintenance Object Repair Procedures".

The modes of the two SPEs can be determined by looking at the amber and green LEDs on the Processor circuit packs. Two important pieces of information can be obtained from these LEDs: an indication of the Active SPE and the Standby SPE and an indication of whether the Standby SPE is ready to take over as the Active SPE (that is, shadowing is enabled and Memory has been refreshed). This information can be determined as follows:

- Indication of Active SPE:
  - Processor Circuit Pack: amber-on
- Indication of Standby SPE:
  - Processor Circuit Pack: amber-off
- Standby SPE in Standby Mode ready to take over for Active SPE:
  - Processor Circuit Pack: amber-off, green-off.

Repair Procedures for High and Critical Reliability

This section describes the procedure for installing or replacing Standby SPE circuit packs. These circuit packs are:

- Processor Circuit Pack (TN773 [286 system] or TN786B [386 system])
- Memory Circuit Packs (2) (TN770 [286 system])
- Memory Expansion Board (CPP1 [386 system])
- Network Control Circuit Pack (TN777[B])
- Packet Control circuit pack (TN778) [386 system and Global]
- Processor Interface circuit pack(s) (TN765)
- Tape Unit (TN774) (G3iV1.1-286 system)
- Duplication Interface circuit pack (TN772).

This procedure does **not apply** to the TN768 or TN780 Tone-Clock circuit pack. Refer to the TONE-BD (Tone-Clock Circuit Pack), the TONE-PT (Tone Generator), or the TDM-CLK (TDM Bus Clock) documentation in Chapter 11, "Maintenance Object Repair Procedures", for the procedure to replace the Tone-Clock circuit pack.

CAUTION:
When circuit packs in the Active SPE are to be replaced, this section provides procedures for performing an SPE-interchange that results in the circuit packs being in the Standby SPE. SPE circuit packs should never be replaced while they are located in the Active SPE.

This section should be used as follows:

1. When defective (that is, alarmed) Active or Standby SPE circuit packs are to be replaced, the procedure begins at the "Replacing Defective SPE Circuit Packs" section. Ignore the "Upgrading SPE Circuit Packs" section, as it does **not apply** to replacing defective Standby SPE circuit packs.
2. When healthy Standby SPE circuit packs are to be upgraded, the procedure begins at the "Upgrading SPE Circuit Packs" section. Ignore the "Replacing Defective SPE Circuit Packs" as it does **not apply** to upgrading Standby SPE circuit packs.

The "Circuit Pack Replacement Procedure" and "Additional Tests for Replaced DATA-CHL, PKT-CTRL, and PROCR Circuit Packs" sections apply to both situations but should be referred to only **after** reading the appropriate sections as instructed previously.

Replacing Defective SPE Circuit Packs

Determine that software is running by looking at the G3MT and verifying that it does not have either the "SPE DOWN MODE" or the "Duplication Interface - Processing Element Communication Down" message displayed. If system software is not running or if it stops running at any point during this procedure, the following is a suggested ranked order list of Processor Complex circuit packs to replace in an attempt to fix the SPE down problem:

- Processor Circuit Pack (TN773 [286 system] or TN786B [386 system] TN790 [Release 5])
- Memory Circuit Packs (2) (TN770 [286])
- Memory Expansion Board (CPP1 [386])
- Network Control Circuit Pack (TN777[B])
- Packet Control circuit pack (TN778)
- Duplication Interface circuit pack (TN772)
- Network Control circuit pack (TN777[B])
- Processor Interface circuit pack (TN765)
- Packet Control circuit pack (TN778)

If replacing Processor Complex circuit packs fails to repair the system, escalate the problem.

If system software is running, determine which SPE is the Standby SPE by issuing the **status system** command from the G3MT terminal. Look at the SPE and MODE fields in the upper left corner of the form to determine which SPE (A or B) is the Active SPE; it is labeled as "active." The other SPE is the Standby SPE and is labeled as either "standby," "maint," or "down."

Follow the "Circuit Pack Replacement Procedure" described later **for each Standby SPE circuit pack to be replaced.**

Continue with this procedure as follows.

1. If alarms are against the Active SHDW-CIR, Active DUPINT, or SHDW-LNK, the Duplication Interface circuit pack must be replaced. Proceed to the "Handling SHDW-CIR and SHDW-LNK Alarms in the Active SPE" or "Handling DUPINT Alarms in the Active SPE" sections as applicable.
2. If these sections do not need to be referenced, proceed to the "Circuit Pack Replacement Procedure" section.

The rest of this section describes how the system behaves when there are faulty circuit packs in the SPEs and is meant to be informative rather than part of the general procedure of replacing SPE circuit packs.

In most cases, when circuit packs **other than the Duplication Interface circuit pack in the Active SPE** are defective, the SPE containing the more severely defective circuit packs is always in the Standby SPE. The reasons are:

- If one or more circuit packs are defective and all of them are located in the same SPE, the system software automatically performs an SPE interchange to force that SPE to be the Standby SPE.
- If two or more circuit packs are defective and the defective circuit packs are located in both SPEs, the system software forces the SPE that contains the more severely defective circuit packs to be the Standby SPE. After the defective circuit packs in the Standby SPE are replaced according to the "Circuit Pack Replacement Procedure" described later, the system software automatically performs an SPE interchange to force that SPE to be the Active SPE. The remaining defective circuit packs are then located in the Standby SPE.

If the Duplication Interface circuit pack in the Active SPE becomes defective, the system software **may not** perform an SPE interchange to force that SPE to be the Standby SPE. The reason is:

- Failure of the Duplication Interface circuit pack may result in breakage of the SHDW-LINK (Memory Shadowing Link) or SHDW-CIR (Common Shadow Circuit), ultimately leading to corruption of Standby SPE Memory. An SPE-interchange to a Standby SPE with corrupted memory would result in an unplanned reboot of the system.

Handling SHDW-CIR and SHDW-LNK Alarms in the Active SPE

Check for the existence of SHDW-CIR alarms against the Active SPE Duplication Interface circuit pack or SHDW-LNK alarms. If there are Active SPE SHDW-CIR or SHDW-LNK alarms, inform the customer that a COLD 2 restart of the system is required and determine a time at which the restart may be done. At that time, complete the following steps:

1. Make sure that the tape (memory card) in the Active SPE tape unit (memory card slot) has the most current translations. If it does not, issue the **save translations spe-active** command to put the most current translations on it.
2. Exchange the tapes (memory cards) in the Active SPE and Standby SPE so that the Standby SPE tape unit (memory card slot) contains the tape (memory card) with the most current translations (from the previous step).
3. For a 286 system, issue the **upgrade software** command. This command may take up to 10 minutes to complete. If the command returns immediately with one of the following error messages: "Standby SPE not available; for information use 'status system"' or "Standby SPE busy with another task; for information use 'status system'," issue the **refresh spe-standby** command and retry the **upgrade software** command.

   NOTE:
   It may be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command is issued five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.

   For a 386 system, if the Standby SPE is not in standby mode, issue the **refresh spe-standby** command to put it into standby mode if possible (see the previous Note). If the Standby SPE was successfully put into standby mode, then issue the **reset system interchange** command to cause a PEI. If the refresh or system interchange are unsuccessful, then use the SPE select switches to hard select the Standby SPE (this will result in a COLD 2 restart of the system).
4. If the **upgrade software** (**reset system interchange**) command is successful, an SPE-interchange will have been performed resulting in the new Active SPE performing a COLD 2 (HOT) restart. Follow the "Circuit Pack Replacement Procedure" described later. If the **upgrade software** command failed, determine why the failure occurred, resolve the problem, and repeat this entire procedure.

Handling DUPINT Alarms in the Active SPE

Check for the existence of DUPINT alarms against the Active SPE Duplication Interface circuit pack. If there are Active SPE DUPINT alarms, inform the customer that a reboot of the system may be required and determine a time at which a reboot may be done. At that time, complete the following steps:

1. Make sure that the tape (memory card) in the Active SPE tape unit (memory card slot) has the most current translations. If it does not, issue **save translations spe-active** to put the most current translations on it.
2. Exchange the tapes (memory cards) in the Active SPE and Standby SPE so that the Standby SPE tape unit (memory card slot) contains the tape (memory card) with the most current translations.
3. Throw the SPE Select Switches on the TN772 Duplication Interface circuit packs to force an SPE-interchange so that the current Standby SPE becomes the new Active SPE. If SPE B is currently the Standby SPE, throw both SPE Select Switches to the right. If SPE A is currently the Standby SPE, throw both SPE Select Switches to the left.

   If the Duplication Interface circuit pack actually severed the Memory Shadowing Link resulting in corruption of Standby SPE Memory, the SPE-interchange results in the new Active SPE performing a Reboot (from the tape in a 286 system). However, if the defect in the Duplication Interface circuit pack did not sever the Memory Shadowing Link, the SPE-interchange results in the new Active SPE performing a Warm Start instead.
4. After the SPE-interchange is complete, log into the G3MT terminal. Follow the "Circuit Pack Replacement Procedure" described later **for each circuit pack to be replaced in the new Standby SPE.**

Upgrading SPE Circuit Packs

Determine which SPE is the Standby SPE by issuing the **status system** command from the G3MT. Look at the SPE and MODE fields in the upper left corner of the form to determine which SPE (A or B) is the Active SPE; it is labeled as "active." The other SPE is the Standby SPE and is labeled as either "standby," "maint," or "down."

Follow the "Circuit Pack Replacement Procedure" described later **for each Standby SPE circuit pack to be upgraded**.

When all Standby SPE circuit packs have been upgraded, force the Active SPE to become the Standby SPE as follows:

1. Issue the **status system** command from the G3MT terminal. Look at the SPE and MODE fields in the upper left corner of the form to determine the status of the Standby SPE. Recall that the Standby SPE is labeled as either "standby," "maint," or "down."

2. If the Standby SPE is labeled as "maint," continue issuing the **refresh spe-standby** command followed by the **status system** command until the Standby SPE is labeled "standby."

   NOTE:
   It may be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.

3. If the Standby SPE is labeled "standby," issue the **reset system interchange** command from the G3MT. After the SPE-interchange is complete, log into the terminal, issue the **status system** command, and verify that the SPEs have reversed roles.
4. Then, follow the "Circuit Pack Replacement Procedure" **for each circuit pack to be upgraded in the new Standby SPE.**

Circuit Pack Replacement Procedure

This procedure **does not** apply to the TN768 Tone-Clock circuit pack. Please refer to the TONE-BD (Tone-Clock Circuit Pack), TONE-PT (Tone Generator), or TDM-CLK (TDM Bus Clock) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures" for the procedure to replace the Tone-Clock circuit pack.

NOTE:
See the flowchart of the procedure for installing or replacing Standby SPE Circuit Packs In Duplication Option Systems at the end of this section, for use as a circuit pack replacement maintenance aid.

The following procedure involves throwing the SPE Select Switches to hard-select the current Active SPE. After completing the circuit pack replacement procedure, verify that the SPE Select Switches have been returned to the AUTO position both by noting their position and by noting that the SPE Select Switch LEDs on the TN772 Duplication Interface circuit packs are not on.

1. Throw the SPE Select Switches, **one at a time**, to force selection of the current Active SPE. If SPE B is currently the Active SPE, throw both SPE Select Switches, **one at a time**, to the right. If SPE A is currently the Active SPE, throw both SPE Select Switches, **one at a time**, to the left. Throwing the SPE Select Switches automatically disables shadowing.

   NOTE:
   Do not remove power before proceeding with step 2. All PPN Control Carriers used in High or Critical Reliability Systems (A slot for the

Duplication Interface circuit pack identifies these carriers.) have staggered pins to support the hot plug-in of circuit packs.

2. Unseat the Standby SPE Processor circuit pack. (It is not necessary to entirely remove the Standby SPE Processor circuit pack from its slot.)

3. If the circuit pack to be replaced is the TN772 Duplication Interface in the A carrier, continue with this step. Otherwise, proceed to Step 4.

   Issue the **status system** command from the G3MT terminal, and check the status of the Tone-Clock in the 1B carrier:

   a. If the SERVICE STATE field indicates that the 1B carrier Tone-Clock is “in” (that is, in service) and the SYSTEM CLOCK and SYSTEM TONES fields indicate that it is “active,” proceed to Step 4.

   b. If the SERVICE STATE field indicates that the 1B carrier Tone-Clock is "in" (that is, in service) but the SYSTEM CLOCK and SYSTEM TONES fields indicate that it is "standby," then check the Error Log for an active Error Type 3329 against the 1B TONE-BD by issuing the **display error** command. If this error exists, proceed to Step 4.

      NOTE:
      Error Type 3329 implies that the Tone-Clock circuit pack probably cannot provide system clocks and an attempt to set the system clocks to this circuit pack would result in a **reset system 2** of the system. When the 1A Duplication Interface circuit pack is replaced, however, the system experiences a loss of clock, and a **reset system 2** occurs.

      If an active Error Type 3329 is not logged against the 1B TONE-BD, issue the **set tone-clock 1B** command from the G3MT terminal to make the 1B carrier Tone-Clock active. Verify that the switch occurs by issuing the **status system** command and checking that the SERVICE STATE, SYSTEM CLOCK and SYSTEM TONES fields are now "in" and "active." Proceed to Step 4.

      NOTE:
      If the 1B Tone-Clock circuit pack is defective the switch may have failed and a **reset system 2** may have occurred. In this case, proceed to Step 4. However, the system experiences a loss of clock and another **reset system 2** when the 1A Duplication Interface circuit pack is replaced.

   c. If the SERVICE STATE field indicates that the 1B carrier Tone-Clock is "out" (that is, out-of-service), refer to the TONE-BD (Tone-Clock circuit pack), TONE-PT (Tone Generator), and TDM-CLK (TDM Bus Clock) Maintenance documentation in Chapter 11, "Maintenance

Object Repair Procedures", to restore it to service. Proceed to Step 4 regardless of whether or not the attempt to restore the 1B Tone-Clock to service was successful.

NOTE:
If the 1B Tone-Clock was not successfully restored to service, the system experiences a loss of clock, and a **reset system 2** when the 1A Duplication Interface circuit pack is replaced.

4. If the circuit pack to be replaced is the TN772 Duplication Interface, throw the SPE Select Switch of the replacement Duplication Interface circuit pack to the same position as the SPE Select Switch on the Duplication Interface circuit pack that was removed.

   If the Standby Processor is not being replaced Install the replacement circuit pack and reinsert the Standby SPE Processor circuit pack.

   a. If the circuit pack that was replaced was the TN772 Duplication Interface in the A carrier, the G3MT terminal is logged off. Log in to the Manager I terminal and proceed to Step 7.

   b. If the circuit pack that was replaced was the TN770 Memory circuit pack, all LEDs on the circuit pack remain on until Step 7 has been completed.

5. If the circuit pack to be replaced is a TN786B or TN790 Standby SPE Processor circuit pack loaded with the same software as loaded in the Active Processor or is a TN770 Standby SPE Processor circuit pack, install the circuit pack and proceed to Step 7.

6. If the circuit pack to be replaced is a TN786B or TN790 Standby SPE Processor circuit pack and the software is being loaded from the software memory card, continue with the following steps:

NOTE:
The TN790 must have the same number of SIMMs as the replaced circuit pack.

   a. Insert the software memory card into the Active SPE. Issue the **list configuration software-versions** Command from the G3MT terminal. If the software matches and the UPDATE FILE Identifier displays **none**, continue with this procedure; otherwise escalate the problem. *Replace the translation memory card in the Active SPE.*

   b. Insert the software memory card into the Standby SPE.

   c. Install the TN786B Standby Processor circuit pack. When the Standby Processor starts to initialize and detects the software memory card, it does a software upgrade and displays the progress of this upgrade on the G3MT terminal.

d. At the prompt of **REPLACE SOFTWARE MEM-CARD ON <STANDBY SPE> WITH TRANSLATION MEM-CARD**, replace the software memory card in the Standby SPE with the translation memory card. The Standby SPE will then boot up with the translation.

NOTE:
Perform this operation within two minutes. Otherwise the Standby SPE will boot up without translations. However, it will recover the translations when the Active SPE enables memory shadowing to the Standby SPE.

e. At the prompt of **REPLACE TRANSLATION MEM-CARD ON <ACTIVE SPE> WITH SOFTWARE MEM-CARD**. Wait 3 minutes for the Standby SPE to initialize before proceeding to next step.

f. Issue the **list configuration software-versions long** command to ensure that both SPEs are running identical software. Use the next step if the this command will not display the software versions, otherwise skip the next step.

g. Issue the **busyout spe-standby** command followed by the **release spe-standby** command to force the Standby SPE into a mode to accept the **list configuration software-versions long** command. Wait 5 minutes for the Standby SPE to initialize and issue the **status system 1st-cabinet** command. The Standby SPE failed to initialize if the Standby SPE Mode is **down**. If the Standby SPE Mode is **maint/init** or **maint/entering**, execute the **busyout spe-standby** and **release spe-standby** command up to 2 more times. *If this step did not succeed, try this procedure again or escalate the problem.*

7. Issue the **status system 1st-cabinet** command from the G3MT terminal. The status system form indicates the presence of MAJOR and MINOR alarms on both SPEs. If SPE alarm counts are displayed, run component tests to resolve these alarms. Allowed tests include **test spe-standby**, **test duplication-interface**, and **test shadow-link**. Use the next step if the allowed test commands are not accepted, otherwise skip the next step.

CAUTION:
If the Duplication Interface circuit pack is being tested, Test #278 fails because the SPE Select Switches are thrown.

8. Issue the **busyout spe-standby** command followed by the **release spe-standby** command to force the Standby SPE into a mode to accept the **test commands** attempted in the previous step. Wait 5 minutes for the Standby SPE to initialize and issue the **status system 1st-cabinet** command. If the Standby SPE failed to initialize if the Standby SPE Mode is **down**. If the Standby SPE Mode is **maint/init** or **maint/entering**,

execute the **busyout spe-standby** and **release spe-standby** command up to 2 more times. *If this step did not succeed, try this procedure again or escalate the problem*.

9. If other Standby SPE circuit packs are to be replaced, return to Step 2.

10. Move each SPE Select Switch back to the AUTO position. If any of the TN777[B] Network Control or the Processor circuit packs were replaced, please refer to the "Additional Tests for Replaced DATA-CHL, PKT-CTRL, and PROCR Circuit Packs" section.

WARNING:
Move only one SPE Select Switch at a time. DO NOT move both switches at the same time.

CAUTION:
If the Active SPE has alarms in it, an SPE-interchange may occur after moving each SPE Select Switch back to the AUTO position.

Maintenance activity is performed automatically on the Standby SPE after the SPE Select Switches are returned to their AUTO positions in Step 10. This can be verified by issuing the **status system** command and noting that the Standby SPE is labeled as "maint." It may take up to five minutes for this activity to begin. The maintenance activity itself takes from 10 to 30 minutes to complete.

NOTE:
The time required for the maintenance activity to complete depends on the number of TN765 Processor Interface circuit packs, the number of administered ports on the Processor Interface circuit packs, the number of administered data channels on the TN777[B] Network Control circuit pack, and the current load on the system.

The completion of the maintenance activity can be verified by issuing the **status system 1** command and noting whether the Standby SPE is labeled as "standby."

Although not recommended at this stage of the procedure, the maintenance activity on the Standby SPE can be preempted using the **refresh spe-standby** command. To preempt the maintenance activity, continue issuing the **refresh spe-standby** command followed by **status system 1** command until the status system form shows that the Standby SPE is labeled "standby."

It may be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.

If the **status system 1** command continues to show SPE alarms, issue the appropriate command(s) from the G3MT terminal to test these alarmed MOs.

After Step 10, if the Active SPE contains more severely defective circuit packs than the Standby SPE, an SPE-interchange may occur. The presence of alarms in the Active and Standby SPE can be verified by issuing the **status system** command. The status system form indicates the presence of MAJOR and MINOR alarms on both SPEs. If the Active SPE has alarms in it, an SPE-interchange may occur. The occurrence of the SPE-interchange can be verified by issuing the **status system** command to determine which SPE is now the Active SPE.

Additional Tests for Replaced DATA-CHL, PKT-CTRL, and PROCR Circuit Packs

After **all** affected circuit packs have been replaced, if the replaced circuit packs include the TN777[B] Network Control circuit pack(s), the TN778 Packet Control circuit pack(s), or the Processor circuit pack(s), additional testing is required to ensure that the new circuit packs are healthy. This testing must be done on these circuit packs when they are located in the Active SPE. Issue the **status system** command to determine which SPE is currently the Active SPE and determine the SPE, Active or Standby, in which each replaced Network Control, Packet Control, and/or Processor circuit pack resides.

If any of the replaced circuit packs are located in the Active SPE, test it by issuing the **test network-control [a | b]**, **test packet-control [a | b]**, or **test processor [a | b]** command, as appropriate. If any tests fail or abort, refer to the SW-CTL (Switch Control), DATA-CHL (Network Control Data Channel), PKT-CTRL (Packet Control Circuit Pack, DATA-BD (Network Control Circuit Pack), or PROCR, and PR-MAINT (Maintenance/Tape Processor) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", as appropriate.

If any of these circuit packs are located in the Standby SPE, force the Standby SPE to become the Active SPE as described in "Upgrading SPE Circuit Packs." However, before the Standby SPE is made to become the Active SPE, the replaced circuit pack should first be tested while on the Standby SPE. Then, test these circuit packs (that are now located in the Active SPE) by issuing the **test network-control [a | b]**, **test packet-control [a | b]**, or **test processor [a | b]** command, as appropriate. If any tests fail or abort, refer to the SW-CTL (Switch Control), DATA-CHL (Network Control Data Channel), DATA-BD (Network Control Circuit Pack), PKT-CTRL (Packet Control Circuit Pack), or PROCR, and PR-MAINT (Maintenance/Tape Processor) Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures", as appropriate.

WARNING:
Before leaving the system, verify that the SPE Select Switches have been returned to their proper position. The switches should be in the AUTO position and the SPE Select Switch LEDs should be off on both the TN772 Duplication Interface circuit packs.

See the following flowchart, Figure 8-3, Figure 8-4 and Figure 8-5, for the procedure for installing or replacing Standby SPE Circuit Packs in Duplication Option System.

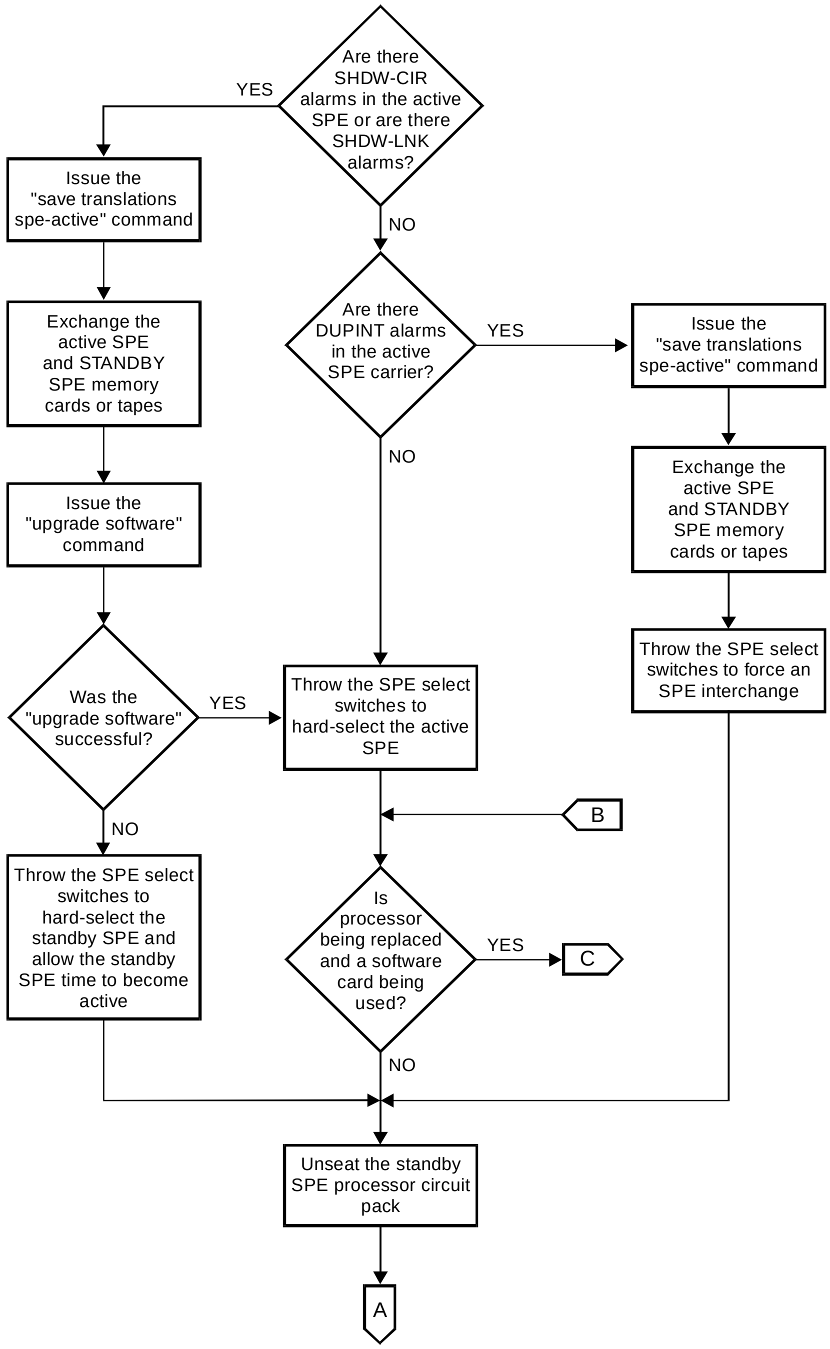


Figure 8-3. Page 1 Procedure for Replacing Standby SPE Circuit Packs

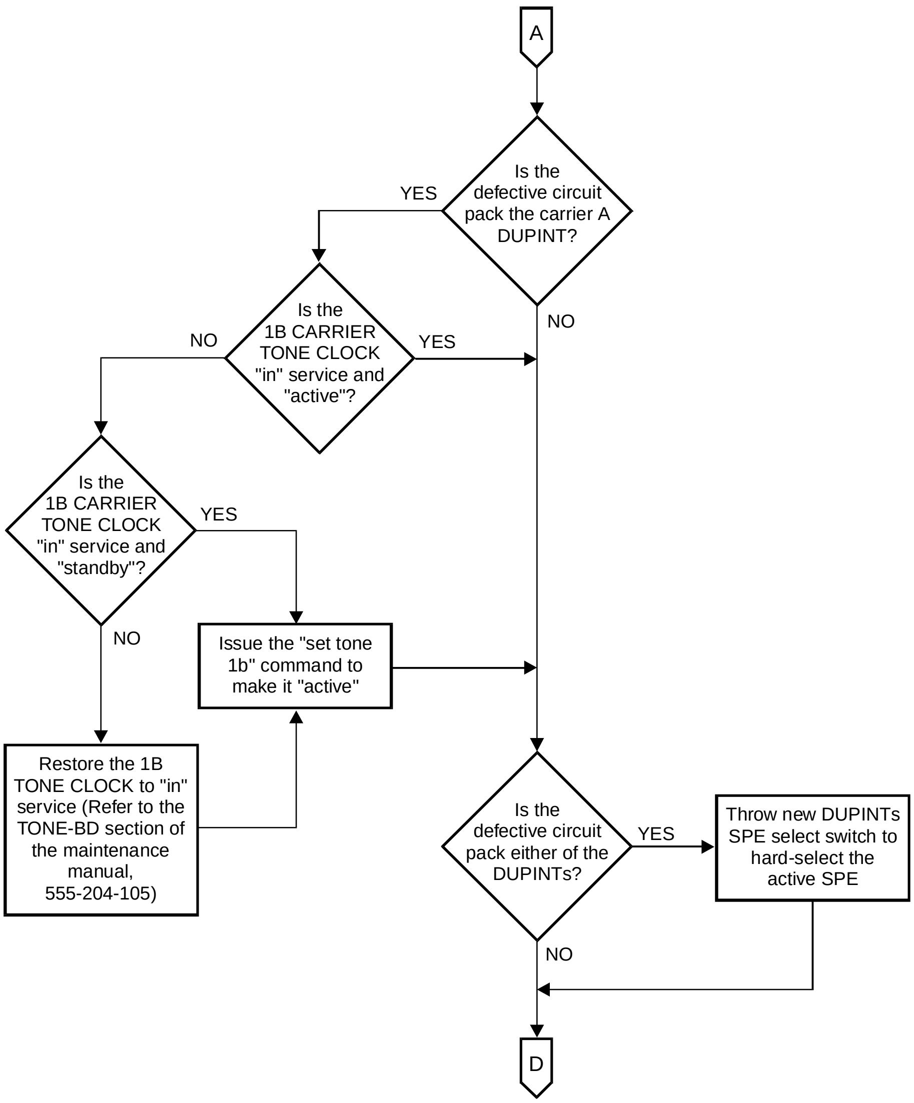


Figure 8-4. Page 2 Procedure for Replacing Standby SPE Circuit Packs

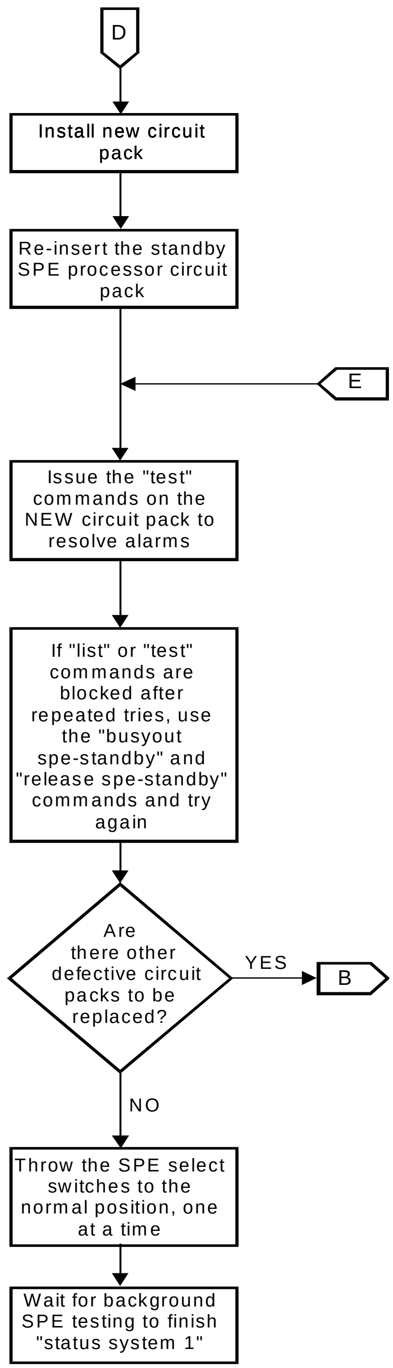


Figure 8-5. Page 3 Procedure for Replacing Standby SPE Circuit Packs

Procedure for Installing/Replacing the Inter-Carrier Cable

The Inter-Carrier Cables (ICCs) are physically located on the back of the cabinet behind the panels and between the A control carrier and the B control carrier. The panels must first be opened to see the ICCs.

> **WARNING:**
> *Damage can be done to the Inter-Carrier Cables during removal or installation. Follow the guidelines listed below to minimize the possibility of damage to the cables and later need of replacement.*

To remove ICC-A, ICC-B, or ICC-C, carefully perform the following steps:

1. Remove power from the system. Refer to the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures".
2. Take hold of the cable connector, not the cable itself. Attempting to remove a cable by pulling on the cable itself can damage the cable-to-connector interface.
3. Pull straight out. Pulling the connector from the backplane at an angle can bend the backplane pins, making it difficult to re-install the cable.
4. Push the ICC connector onto the insulated sleeves.

   > **CAUTION:**
   > *The pins should not show through the back of this connector. If they do, they ICC may be shorted out.*

The only way to check the connector-cable-connector integrity is with a continuity test.

To re-install ICC-A, ICC-B, or ICC-C carefully perform the following steps:

1. Verify that the backplane pins are not bent. If any are bent, they must be straightened or replaced before continuing.
2. Align the ICC connector with the backplane pins and push partially into place.
3. Use a dental mirror and light to view the back sides of the connector. Determine that all 50 backplane pins are seated correctly in the ICC connector.
4. Push the ICC connectors fully onto the insulated sleeves. The pins should not show through the back of the connectors. If the pins show through, the ICC may be shorted out.

Procedure for Blocking Standby SPE Maintenance Activities for System Technician Testing

Sometimes it is necessary to block Standby SPE maintenance activities so that System Technician commands that test Standby SPE components can be conducted without being blocked with the G3MT terminal message line "Standby SPE busy with another task; for information use 'status system'." To block Standby SPE maintenance activities, perform the steps listed below.

WARNING:
The following procedure involves throwing the SPE Select Switches to hard-select the current Active SPE. After completing the circuit pack replacement procedure, verify that the SPE Select Switches have been returned to the AUTO position both by noting their position and by noting that the SPE Select Switch LEDs on the TN772 Duplication Interface circuit packs are not on.

1. Throw the SPE Select Switches (on the TN772 Duplication Interface circuit packs) to force selection of the current Active SPE. If SPE-B is currently the Active SPE, throw both SPE Select Switches to the right. If SPE-A is currently the Active SPE, throw both SPE Select Switches to the left.
2. Issue the **status system 1st-cabinet** command from the G3MT terminal. The status system form indicates the presence of MAJOR and MINOR alarms on both SPEs. If SPE alarm counts are displayed, run component tests to resolve these alarms. Allowed tests include test spe-standby, test duplication-interface, and test shadow-link. Use the next step if the allowed test commands are not accepted, otherwise skip the next step.

   CAUTION:
   If the Duplication Interface circuit pack is being tested, Test #278 fails because the SPE Select Switches are thrown.

3. Issue the busyout spe-standby command followed by the release spe-standby command to force the Standby SPE into a mode to accept the **test commands** attempted in the previous step. Wait 5 minutes for the Standby SPE to initialize and issue the status system 1st-cabinet command. If the Standby SPE failed to initialize if the Standby SPE Mode is down. If the Standby SPE Mode is **maint/init** or maint/entering, execute the busyout spe-standby and release spe-standby command up to 2 more times. *If this step did not succeed, try this procedure again or escalate the problem.*

4. Move each SPE Select Switch back to the AUTO position.

> **WARNING:**
> *Move only one SPE Select Switch at a time. DO NOT move both Switches at the same time.*

Maintenance activity is performed automatically on the Standby SPE after the SPE Select Switches are returned to their AUTO positions in Step 4. This can be verified by issuing the **status system** command and noting that the Standby SPE is labeled as "maint." The maintenance activity takes from 10 to 30 minutes to complete. (The time required for the maintenance activity to complete depends upon the number of TN765 Processor Interface circuit packs, the number of administered ports on the Processor Interface circuit packs, the number of administered data channels on the TN777[B] Network Control circuit pack, and the current load on the system.) The completion of the maintenance activity can be verified by issuing the **status system** command and noting whether the Standby SPE is labeled as "standby."

Although not recommended at this stage of the procedure, the maintenance activity on the Standby SPE can be preempted using the **refresh spe-standby** command. To preempt the maintenance activity, continue issuing the **refresh spe-standby** command followed by **status system** command until the status system form shows that the Standby SPE is labeled "standby."

It **may** be necessary to issue the **refresh spe-standby** command multiple times to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This **does not include** cases where the command completes with the G3MT terminal message line errors "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later."

Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.

Packet Bus Fault Isolation and Correction

9

General

This chapter describes the fault isolation/correction procedures for the Packet Bus and for the various maintenance objects that use the Packet Bus. Because the Packet Bus is shared by all circuit packs that must communicate on it, a faulty circuit pack can disrupt communication over the Packet Bus. In addition, a circuit pack that does not use the Packet Bus can cause service disruptions if the physical configuration of the switch is being modified (this is discussed in more detail later). For these reasons, isolating the cause of Packet Bus failure can be complicated. In this chapter, a flowchart is provided to aid in this isolation effort, as are detailed discussions of the tools and procedures used in the fault isolation and correction.

This chapter is organized into several sections that provide introductory information, as well as the Packet Bus Fault Isolation and Correction Procedures. The sections of the chapter are as follows:

- **Remote Maintenance Versus On-Site Maintenance** discusses the strategy and the requirements for performing remote maintenance and on-site maintenance for the Packet Bus.
- **Tools for Packet Bus Fault Isolation and Correction** discusses the tools that are needed to isolate and correct Packet Bus faults.
- **What is the Packet Bus?** describes the Packet Bus, its use, and the types of faults that can occur on the Packet Bus. A diagram that shows the physical and logical connections between circuit packs connected to the Packet Bus is also included.

- **Circuit Packs That Use the Packet Bus** describes the various circuit packs, ports, and endpoints that use the Packet Bus. The section discusses how these maintenance objects interact, how a failure of one maintenance object can affect another, and also the failure symptoms of these maintenance objects.
- **Maintenance of the Packet Bus** describes the Packet Bus maintenance software strategy. Similarities and differences between the Packet Bus and the TDM Bus are discussed. An overview of the Fault Isolation and Correction Procedures is also presented.
- **The Maintenance/Test Circuit Pack (TN771)** discusses the use of the Maintenance/Test circuit pack in normal switch maintenance, as well as its role in Packet Bus fault isolation. The standalone mode of the Maintenance/Test (which is used to perform the Packet Bus Fault Isolation and Correction procedures on-site) is discussed in detail.
- **Packet Bus Fault Isolation Flowchart** presents a flowchart that is used to isolate a Packet Bus problem. This flowchart is the starting point for this process, and it is used to determine if a failure of service is caused by the Packet Bus itself or by another maintenance object on the Packet Bus.
- **Packet Bus Fault Correction** presents the procedures required to correct either a problem with the Packet Bus itself or one that is caused by a circuit pack connected to the Packet Bus.

The Packet Bus Fault Isolation Flowchart is intended to be the normal starting point for isolating and resolving Packet Bus problems. However, anyone who is unfamiliar with Packet Bus maintenance should read the introductory sections to gain a good understanding of the Packet Bus maintenance and the procedures involved.

Remote Maintenance versus On-Site Maintenance

Most Packet Bus Fault Isolation and Repair procedures require a technician to be on-site. This is true because a Packet Bus failure is caused by a hardware failure of the Packet Bus itself or by a circuit pack that is connected to it. However, initial diagnoses can be made via use of the flowchart presented in the "Packet Bus Fault Isolation Flowchart" section of this chapter. However, before the Maintenance/Test Standalone Mode Procedure (described later) and the Packet Bus Fault Correction Procedure can be implemented, a technician must be on-site. Accordingly, the procedures are presented with this requirement in mind.

The flowchart as presented refers to the repair procedures in Chapter 11, "Maintenance Object Repair Procedures", for various maintenance objects. When one of the decision points is reached, a remote technician can refer to the appropriate section and attempt to resolve any fault conditions. If the procedures for any maintenance object require a dispatch, this should be done. In addition, the remote technician can examine some of the other maintenance objects on the flowchart and determine if those procedures also require a dispatch. Keep in mind that if a maintenance object that appears early on the flowchart fails, this failure can cause alarms with maintenance objects that appear later in the flowchart. However, multiple dispatches can be prevented by checking subsequent stages on the flowchart. Accordingly, the on-site technician can be prepared to replace more components.

The Maintenance/Test Packet Bus port (described in detail later in this chapter) can give the remote technician information about the state of the Packet Bus. This information can be obtained via the **status system** command and via the PKT-BUS test sequence. As described later, the Maintenance/Test circuit pack may or may not be present at a customer site, depending on the configuration of the switch. If a Maintenance/Test circuit pack is not present, one must be taken to the customer site when a dispatch is done for a loss of Packet Bus service.

In a High or Critical Reliability system, a Processor Interchange may resolve the Packet Bus problem. This operation can be done remotely, and it is discussed in the "Packet Bus Fault Correction" section in this chapter.

Tools for Packet Bus Fault Isolation and Correction

The following list discusses several tools that are (or may be) required to perform Packet Bus Fault Isolation and Correction. The technician should be provided with these tools at the customer site:

- TN771 Maintenance/Test circuit pack for use in standalone mode, as well as the required connectors and cables. (Refer to the "The Maintenance/Test Circuit Pack (TN771)" section in this chapter.)
- Replacement TN771 Maintenance/Test circuit pack may be needed. Conditions for requirement, and the relevant implementation steps are documented in the "Special Precaution Concerning the TN771" section in this chapter.
- Backplane pin-replacement kit may be required in the procedures described in the "Packet Bus Fault Correction" section of this chapter. If the kit is not available, replacement of a carrier may be required.

What is the Packet Bus?

The Packet Bus is a set of 24 leads in the backplane of the Port Network. Twenty of these leads are data leads, three are control leads, and one is a spare. This distinction is important only for understanding why some circuit packs are able to detect only certain faults; the distinction does not affect fault isolation and repair. Each Port Network has its own Packet Bus, and, accordingly, there is one Packet Bus maintenance object in each port network. The Packet Bus is not duplicated, as is the TDM Bus. However, there are several spare leads on the Packet Bus and, in High and Critical Reliability systems, these spare leads are used to recover from some failures on the Packet Bus.

Packet Bus Usage

The Packet Bus is used to carry ISDN-BRI signaling information for ISDN-BRI stations and data modules and for ASAI adjunct connections. The TN556 ISDN-BRI circuit pack is used for these connections. The SPE interface to the Packet Bus is the TN778 Packet Control (in High and Critical Reliability systems, there is one TN778 in each SPE). For systems with multiple Port Networks, the TN570 Expansion Interface is used to pass messages from the Packet Bus in one Port Network to the Packet Bus in its neighbor. The TN771 Maintenance/Test Circuit Pack (discussed in detail later) provides Packet Bus maintenance testing and reconfiguration capabilities.

Packet Bus Faults

Two types of Packet Bus failures can occur, as follows:

- **Shorts**. A short occurs when leads on the Packet Bus become connected together. Such a connection can occur due to component failures on the Packet Bus interface of a circuit pack, a failure of the cables between carriers or the TDM/LAN terminators, or by pins being bent together on the backplane. Usually, a failure that occurs during the normal operation of a switch is caused by a circuit pack failure. However, if the switch configuration is being modified (for example, circuit packs are being moved), the cause of a subsequent Packet Bus failure is probably bent pins.
- **Opens**. An open occurs when there is a break on the Packet Bus such that the electrical path to the termination resistors is broken. Usually, this break is caused by a failed TDM/LAN cable or by a failed TDM/LAN terminator. The break can also be caused by a failure in the backplane of a carrier, although this is unlikely.

Shorts on the Packet Bus occur much more often than do opens. This is true because the incorrect insertion of a circuit pack can cause leads to be shorted together. It is possible, in fact, for a circuit pack to be the cause of a Packet Bus fault but still exhibit trouble-free operation. For example, the insertion of a TDM-only circuit pack (for example, TN754 Digital Line) could bend the Packet

Bus pins on the backplane. However, since the circuit pack does not communicate on the Packet Bus, the pack is not affected by the problem.

Packet Bus faults do not necessarily cause service interruptions. However, most Packet Bus shorts do cause these interruptions. Depending on what leads are defective, the system may be able to recover and continue to communicate. While this scenario is advantageous in that the system continues to function, the scenario is also detrimental because it makes isolating the fault difficult. The Maintenance/Test circuit pack provides the capability to detect, and, in some cases, correct Packet Bus faults.

Packet Bus Connectivity Diagram

Figure 9-1 shows the various circuit packs that communicate on the Packet Bus. Logical and physical connections are illustrated. Connectivity with three port networks is similar.

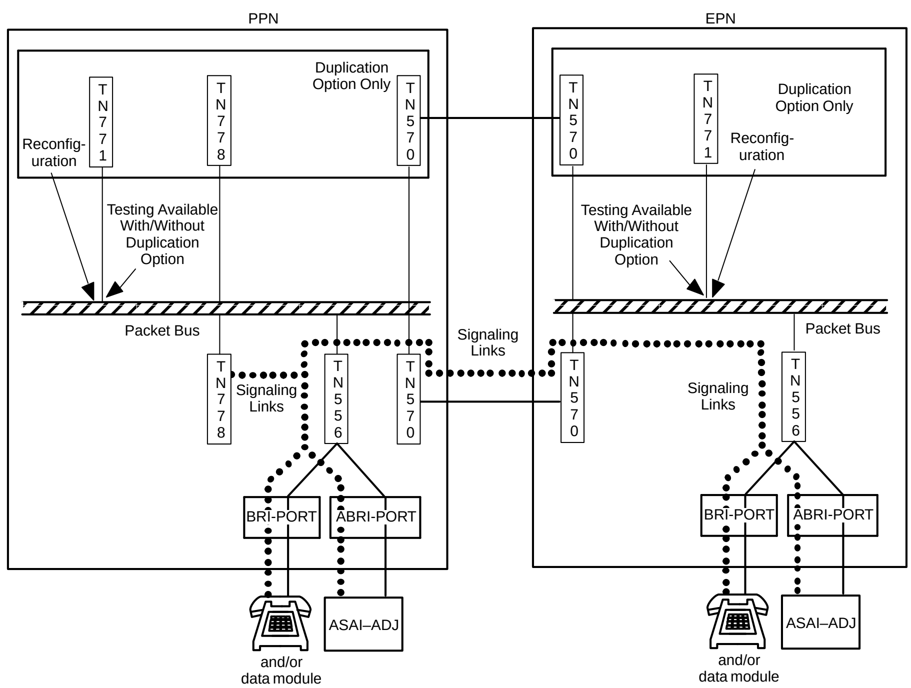


Figure 9-1. ISDN-BRI/Packet Bus Connectivity

For details on ISDN-BRI and ASAI connectivity, refer to BRI-PORT and BRI-SET/ASAI-ADJ documentation in Chapter 11, "Maintenance Object Repair Procedures". For details on Expansion Interface connectivity, refer to EXP-INTF documentation in Chapter 11, "Maintenance Object Repair Procedures".

Circuit Packs That Use the Packet Bus

This section gives a brief description of the DEFINITY circuit packs that use the Packet Bus. The section explains how a Packet Bus failure can affect these circuit packs, and also how a failure of one of these circuit packs can cause a Packet Bus failure.

Overview of the Circuit Packs and Related Maintenance Objects

Four circuit packs can use the Packet Bus. The following list identifies and discusses each circuit pack. An explanation of how each circuit pack assists in Packet Bus maintenance is also included.

NOTE:
The maintenance object(s) involved with each circuit pack are listed in brackets. Documentation for each maintenance object is provided in Chapter 11, "Maintenance Object Repair Procedures".

- **TN778 Packet Control** [PKT-CTRL] provides the SPE interface to the Packet Bus, just as the TN777 Network Control does to the TDM Bus. All traffic on the Packet Bus passes through the Packet Control.

  The Packet Control can detect failures of certain control leads on the bus. Such failures are indicated by an inability to transmit data. The Packet Control can also detect data errors on the Packet Bus.

- **TN570 Expansion Interface** [EXP-INTF] is used to connect the Port Networks (PNs) in the system. For systems that use the Packet Bus, all Port Network connections must be made with TN570 circuit packs (and not the TN776 Expansion Interface circuit packs used in DEFINITY G1 and non-Packet DEFINITY. All Packet traffic between PNs passes through a pair of TN570s (one in each port network).

  The Expansion Interface can detect a subset of control lead failures (though not so many as the Packet Control), and it can detect many data lead failures via parity errors on received data.

- **TN556, TN2198 and TN2208 ISDN-BRI circuit packs** [BRI-BD, BRI-PORT, ABRI-PORT, BRI-SET, BRI-DAT, ASAI-ADJ] provides connections for ISDN-BRI station sets and data modules and for ASAI adjuncts. The Packet Bus is used to carry signaling information for sets and data modules. The Packet Bus passes signaling information and ASAI messages between the SPE and the ASAI adjunct. The ISDN-BRI circuit pack has the same fault detection capabilities as the TN570 Expansion Interface.

- **TN771 Maintenance/Test circuit pack** [M/T-BD, M/T-DIG, M/T-PKT] is the workhorse of Packet Bus maintenance. This circuit pack can detect all Packet Bus failures for the Port Network in which it resides. In High and Critical Reliability systems, the circuit pack enables the reconfiguring of the Packet Bus around a small number of failed leads. The TN771D circuit pack provides a standalone mode (that is, one that does not involve communication with the SPE) for inspecting the Packet Bus for faults. This is a critical tool for the Packet Bus Fault Correction procedures, which are described later.

NOTE:
All Maintenance/Test circuit packs to be used in DEFINITY must be of vintage TN771D or later. The circuit pack is also used for ISDN-PRI trunk testing (M/T-DIG). This functionality is not relevant to Packet Bus maintenance, and it is discussed in Chapter 11, "Maintenance Object Repair Procedures".

Effect of Circuit Pack Failures on the Packet Bus

A failure of any of the circuit packs described in the previous section can disrupt traffic on the Packet Bus. Some failures cause actual Packet Bus failures with corresponding alarms, while others cause service outages without alarming the Packet Bus (although the failed circuit pack(s) should be alarmed).

The following list discusses the effects on the Packet Bus of a failure on each circuit pack that uses the Packet Bus.

- **TN778 Packet Control**. A failure of the Packet Control typically causes all Packet traffic in the system to fail. As a result, ISDN-BRI sets are not able to make or receive calls, and communication with an ASAI adjunct fails. A failure of the Packet Control may also cause a failure of the Packet Bus itself if the failure is on the interface circuitry. Otherwise, only the Packet Control is alarmed.

  In a High or Critical Reliability system, there is one TN778 Packet Control in each SPE. If a Packet Control failure in the active SPE causes a Packet Bus disruption, performing an SPE interchange may restore service. In some cases, circuit pack failures may require that the circuit pack be replaced before service is restored.

- **TN570 Expansion Interface**. A failure of the Expansion Interface typically causes all Packet traffic in the connected EPN to fail. If the failure is on the Packet Bus interface, the Packet Bus may be alarmed as well.

In a High or Critical Reliability system, there is one EPN link in each control carrier for each EPN. If an active Expansion Interface failure causes a Packet Bus disruption, performing an Expansion Link switch may restore service. In some cases, circuit pack failures may require that the circuit pack be replaced before service is restored.

- **TN556 ISDN-BRI Circuit Pack**. A failure of the ISDN-BRI circuit pack typically causes some or all ISDN-BRI sets and data modules and/or an ASAI adjunct connected to the circuit pack to fail to function. If the failure is on the Packet Bus interface, the Packet Bus may be alarmed as well.
- **TN771 Maintenance/Test**. A failure of the Maintenance/Test may cause an incorrect indication of a Packet Bus failure or the inability to detect such a failure. A failure of the Packet Bus interface of the circuit pack may cause the Packet Bus to be alarmed.

As is indicated in the previous list, a failure of the Packet Bus interface on any of the circuit packs discussed can cause the Packet Bus to be alarmed. This is true because such a failure may result in shorting Packet Bus leads together. This typically disrupts ALL Packet Bus traffic in the affected port network. Remember that a failure of the Packet Bus in the PPN affects packet traffic in the EPNs as well. Also, Packet Bus failures that do not affect all endpoints on that Packet Bus may occur. Therefore, a Packet Bus failure should not be ruled out even if some Packet service is still present.

A circuit pack can fail in a manner such that it transmits bad data on the Packet Bus. If the Packet Control fails in such a fashion, all Packet traffic is disrupted (because all traffic requires the Packet Control). Likewise, such a failure on the Expansion Interface may disrupt all Packet traffic in that port network.

However, if an ISDN-BRI circuit pack fails such that it transmits bad data, all devices connected to the circuit pack fail to function. This failure may also disrupt the entire Packet Bus whenever the circuit pack tries to transmit data. Such a disruption may be indicated by Packet Bus alarms that occur and go away, intermittent failures of other Packet circuit packs, and/or interference with other connected endpoints. The failures mentioned are difficult to isolate because of their intermittent nature. In most cases, the failed circuit pack is usually alarmed, and all connected endpoints on the circuit pack are out of service until the circuit pack is replaced. These symptoms help in isolating the fault.

Maintenance of the Packet Bus

This section discusses the maintenance of the Packet Bus. Accordingly, the following topics are discussed:

- Comparison between the Packet Bus and the TDM Bus
- Packet Bus Maintenance Software
- Overview of Fault Correction Procedures

Packet Bus and TDM Bus: a Comparison

Although the Packet Bus is similar to the TDM Bus in many ways, there are some important differences. For example, there are two physical TDM Busses in the switch (refer to the TDM-BUS section in Chapter 11, "Maintenance Object Repair Procedures", for more information), and one of these busses can fail without affecting the other (although half of the call-carrying capacity is lost in this case). On the other hand, there is only a single Packet Bus in the switch, and a failure of that bus can disrupt all traffic on the Packet Bus.

In High or Critical Reliability systems, the Maintenance/Test circuit pack provides Packet Bus reconfiguration capabilities. This allows the Packet Bus to remain in service with up to three lead failures. There is no corresponding facility on the TDM Bus, where the second physical TDM Bus continues to carry traffic until repairs are completed.

In addition, the system response varies according to the type of bus failure. Specifically, a catastrophic TDM Bus failure (one that affects both TDM Buses) disables ALL traffic in the system, while a catastrophic Packet Bus failure affects only Packet traffic. This means that all TDM traffic is unaffected, while all BRI and ASAI traffic does not work. The significance of this distinction depends on the customer's application. (For example, a customer whose primary application requires ASAI would consider the switch to be out of service, while a customer with a large number of Digital/Analog/Hybrid sets and a small number of ISDN-BRI sets would probably not consider the Packet Bus failure a catastrophic problem.) The only way a Packet Bus failure can affect TDM traffic is via possible impact on system response time in a large switch due to ISDN-BRI endpoint maintenance running. This should rarely happen because the Packet Bus maintenance software is able to prevent this impact for most Packet Bus faults (see the next section).

CAUTION:
Since the correction procedures and some of the fault isolation procedures for the Packet Bus are highly destructive to service throughout the system (inasmuch as the procedures primarily involve removing circuit packs), particular attention must be paid to nondestructive fault isolation. Also, for the same reason, the time taken with destructive procedures must be minimized. This is the major reason that maintenance of the Packet Bus and of the Packet maintenance objects is described in such detail.

Packet Bus Maintenance Software

Packet Bus maintenance software involves the traditional set of error conditions, tests, and alarms relevant to Packet Bus faults. These are described in the PKT-BUS section in Chapter 11, ''Maintenance Object Repair Procedures'', and they are similar in design to the maintenance strategy for most maintenance objects.

In addition, because a Packet Bus failure can cause all BRI/ASAI endpoints in the affected Port Network (and their associated ports and circuit packs) to report failures, special care must be taken to ensure that the flood of error messages from the affected maintenance objects does not overload the system and interfere with TDM Bus traffic. When such a failure occurs, maintenance of Packet circuit packs is affected in the following manner:

- ISDN-BRI circuit pack (BRI-BD) in-line errors indicating possible Packet Bus failures are placed into the error log, but are not acted upon.
- ISDN-BRI port (BRI-PORT, ABRI-PORT) in-line errors indicating possible Packet Bus failures **are neither placed into the error log nor acted upon.**
- ISDN-BRI endpoint (BRI-SET, BRI-DAT, ASAI-ADJ) in-line error **are neither placed into the error log nor acted upon.**
- Circuit pack and port in-line errors that are not related to the Packet Bus, or that indicate a circuit pack failure, are acted upon in the normal fashion.
- Normal background maintenance (periodic and scheduled) is not affected.
- Foreground maintenance (for example, commands executed on the Manager I terminal) are not affected.

These interactions allow normal, non-Packet, system traffic to continue unaffected, and they reduce the number of extraneous entries into the Error/Alarm Logs. If the Packet Bus failure is caused by a failed circuit pack, the circuit pack should appear in the Error/Alarm Logs, which aids in fault isolation.

The following events indicate a Packet Bus failure that requires the actions in the previous paragraph to occur:

- In-line errors that indicate a possible Packet Bus failure reported by two or more Packet circuit packs
- Packet Bus Uncorrectable report from the Maintenance/Test Packet Bus port (M/T-PKT)
- Packet Bus Interface Failure from the Packet Control (PKT-CTRL)

If such a failure occurs, this information will be available in an Error Log entry for PKT-BUS. Refer to the PKT-BUS section in Chapter 11, ''Maintenance Object Repair Procedures'', for more detailed information.

Overview of Fault Correction Procedures

This section gives an overview of the procedures used to (1) isolate the cause of Packet Bus faults and to (2) correct the Packet Bus faults. These procedures are applicable to High and Critical Reliability systems, and they are detailed fully later in this chapter:

1. The first procedure attempts to determine if a circuit pack that interfaces to the Packet Bus is the cause of the Packet Bus problem. The error and alarm logs are examined for entries for these circuit packs, and the normal maintenance procedures for those circuit packs are attempted.
2. If the Packet Bus problem still exists, port circuit packs (those in the purple slots) are removed to look for circuit pack(s) that have failed and/or have damaged the Packet Bus pins (a diagram of the backplane pins is provided later).
3. If the Packet Bus problem is still not resolved, the same procedure is attempted for the control complex circuit packs.
4. If the problem is still not resolved, or if the Packet Bus faults are known to have open leads, a procedure is undertaken in which the bus terminators and cables are replaced. If this does not resolve the problem, the carrier connectivity of the port network is reconfigured to attempt to isolate a faulty carrier.

The Maintenance/Test Circuit Pack (TN771)

Description

The TN771 Maintenance/Test circuit pack provides the following functions:

- ISDN-PRI Trunk Testing
- Packet Bus Testing
- Packet Bus Reconfiguration

Packet Bus reconfiguration is available only in High and Critical Reliability systems. In such systems that use the Packet Bus, a Maintenance/Test is required in each port network. In other configurations (for example, Standard Systems, no Packet Bus use), the circuit pack is optional. The ISDN-PRI Trunk Testing functions are discussed in the ISDN-PRI and M/T-DIG sections in Chapter 11, "Maintenance Object Repair Procedures".

CAUTION:
All TN771 circuit packs must be of TN771D vintage or later.

Normal Packet Functionality

The Maintenance/Test Packet Bus Port (M/T-PKT) provides the Packet Bus testing and reconfiguration capabilities. When the port is in service, the port continuously monitors the Packet Bus for faults (or recovery from faults), and it reports this information to Packet Bus (PKT-BUS) maintenance.

The yellow LED on the TN771 Maintenance/Test circuit pack provides a visual indication of the state of the Packet Bus, as follows:

- **Blinking** at a rate of 1 per sec — the Maintenance/Test Packet Bus port cannot swap leads to correct a Packet Bus fault (that is, there are too many faults). **The Packet Bus may be unusable**. If the failures detected by the Maintenance/Test Packet Bus port are open lead failures, the Packet Bus may still be operating.
- **On steady** — the Maintenance/Test Packet Bus port has swapped leads on the Packet Bus. **The Packet Bus is still operating**.

  NOTE:
  Because the yellow LED on the Maintenance/Test circuit pack can also be on steady when the other ports on the circuit pack are in use, the ports on the Maintenance/Test circuit pack used for ISDN-PRI trunk testing must be busied out before the Maintenance/Test circuit pack is used to help resolve Packet Bus faults. This is done via the

busyout port PCSS02 and **busyout port PCSS03** commands. Also, be sure to release these ports when the process is completed.

- **Off** — there is no Packet Bus fault present.

  NOTE:
  It takes 5 to 10 seconds for the LED to respond to a change in the state of the Packet Bus.

In normal switch operation, the Maintenance/Test provides the visual feedback of the Packet Bus state. When standalone mode (described in the next section) is in effect, these visual indications are still provided; however, the Packet Bus is never reconfigured, and, as a result, the yellow LED either blinks or is off.

Standalone Mode

The TN771D Maintenance/Test provides a standalone mode for detecting Packet Bus faults. In the standalone mode, a terminal is connected to the Maintenance/Test circuit pack via the Amphenol™ connector on the back of the cabinet. This setup allows the System Technician to determine the state of the Packet Bus without having to access the Manager I terminal to provide these functions, even if the switch is not in service. Note that the Maintenance/Test does not reconfigure the Packet Bus when it is operating in standalone mode.

Standalone mode is used in the Packet Bus Fault Correction procedures. As a result, **a TN771 and a corresponding terminal must be available to the technician who is to perform such procedures**. A High or Critical Reliability system has a TN771 in each port network. However, the customer of a system that does not have High or Critical Reliability may have purchased a TN771 for ISDN-PRI trunk testing, or to increase the system's ability to detect Packet Bus failures.

The **list configuration** command is used to check for the presence of a circuit pack in the system. If a circuit pack is not present in the system, one must be taken to the customer site. The "Special Precaution Concerning the TN771" section in this chapter discusses the special cases when a spare TN771 must be taken to the customer site.

NOTE:
When in standalone mode, the yellow LED on the TN771 blinks if there is a Packet Bus fault. If there is no such fault, the yellow LED is off. This is true because Packet Bus reconfiguration cannot occur in standalone mode.

Required Hardware for Standalone Mode

In addition to the TN771, the following equipment is required to use the standalone mode:

1. Terminal or PC with terminal-emulation software. The EIA-232 (RS-232) port should be configured at 1200 baud, no parity, 8 data bits, and one stop bit. This is **not** the same configuration as for the Manager I terminal. Therefore, if the Manager I can be used for this operation (and this depends on the switch configuration and on customer requirements), remember to restore the original communication parameters before returning the Manager I to service.
2. 355A EIA-232 Adapter (COMCODE 105 012 637). This adapter is illustrated in Figure 9-2.
3. 258B Six-Port Male Amphenol Adapter (COMCODE 103 923 025). This adapter is illustrated in Figure 9-3.
4. D8W 8-wire modular cable of an appropriate length to connect the 258A on the back of the cabinet to the 355A adapter. The relevant COMCODE is determined by the length of the cable, as follows:
   - 103 786 786 (7 feet)
   - 103 786 802 (14 feet)
   - 103 786 828 (25 feet)
   - 103 866 109 (50 feet)

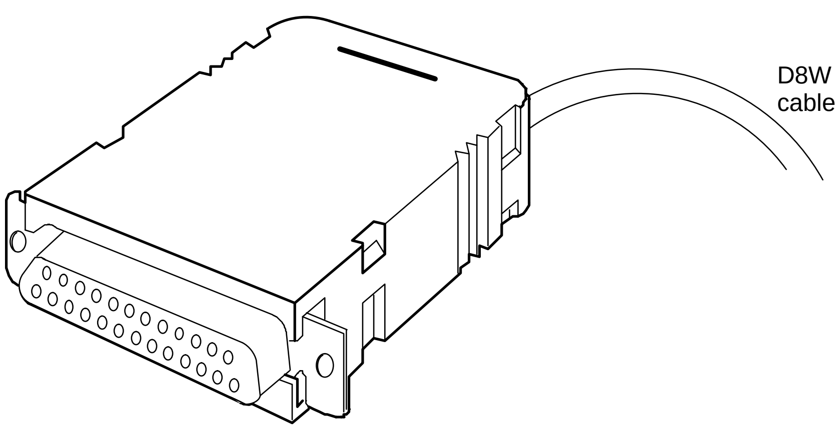


Figure 9-2. 355A EIA-232 Adapter

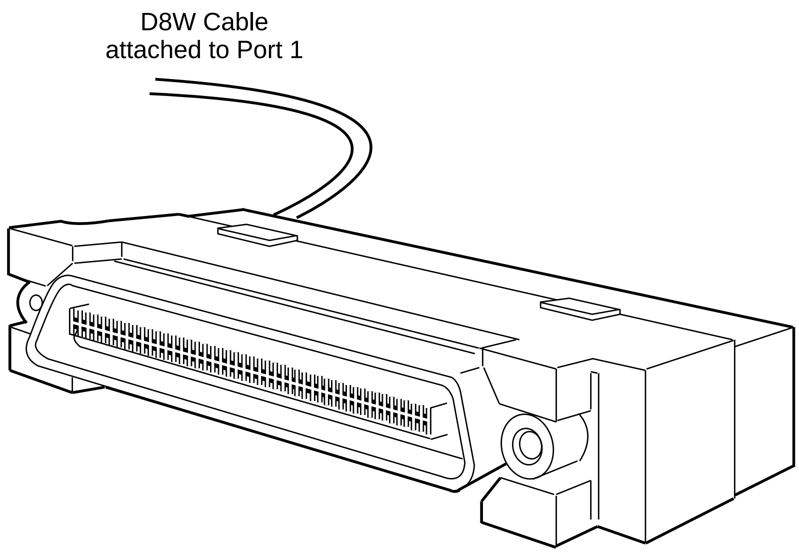


Figure 9-3. 258B Six-Port Male Amphenol Adapter

Slot Selection for Standalone Mode

When selecting a carrier slot to use for standalone mode in a port network that does not already contain a TN771, keep the following points in mind:

- A port circuit slot (indicated by a purple label) should be used.
- -5 volt power supply must be available in the carrier. (Refer to CARR-POW maintenance in Chapter 11, ''Maintenance Object Repair Procedures''. This section describes the power supply configurations that provide this power supply.)
- It is preferable that the slot chosen is in the A carrier if a free slot that matches the criteria presented in the first two items of information in this list is available.

Entering and Exiting Standalone Mode

NOTE:
When in standalone mode, the red LED on the TN771 is lit. This function is correct, and it serves as a reminder to remove the TN771 from standalone mode.

CAUTION:
The TN771 in standalone must be the ONLY TN771 in the port network. If a TN771 is already in the port network, place that TN771 in standalone mode. Do not insert a second TN771 into standalone mode. System behavior is rendered as undefined if this is done. In addition, the system is not able to detect the extra circuit pack in this case because a TN771 in standalone mode is invisible to the SPE.

CAUTION:
If the TN771 Packet Bus port has reconfigured the Packet Bus in a switch with a High or Critical Reliability system, (indicated by error type 2049 against PKT-BUS), placing the Maintenance/Test in standalone mode causes a loss of service to the Packet Bus. This is true because reconfiguration is not performed in standalone mode. Therefore, this procedure should be considered a service-disrupting procedure.

If the system has a TN771 installed in the Port Network to be examined, use the following steps to enter the standalone mode:

1. Ensure that Alarm Origination is suppressed either at login time or via the Maintenance-Related System Parameters form.
2. Attach the 258B Six-Port Male Amphenol Adapter to the Amphenol connector for the TN771's slot. Connect one end of a D8W 8-wire modular cable to port 1 of the 258B. Connect the other end of the cable to a 355A EIA-232 Adapter. Plug the EIA-232 Adapter into the terminal to be used, and turn the terminal on.
3. Reseat the TN771 circuit pack.

   NOTE:
   In a High or Critical Reliability system, this causes a Minor, Off-board alarm to be raised against the Packet Bus. This alarm is not resolved until the TN771 (in particular, the Packet Bus port (M/T-PKT)) is returned to service. To ensure that Packet Bus alarms have been cleared, it may be necessary to restore the TN771 to normal mode.

If there is no TN771 in the Port Network, use the following steps to enter the standalone mode:

1. Attach the 258A Six-Port Male Amphenol Adapter to the Amphenol connector for the slot into which the TN771 is to be inserted. Connect one end of a D8W 8-wire modular cable to port 1 of the 258A. Connect the other end of the cable to a 355A EIA-232 Adapter. Plug the EIA-232 Adapter into the terminal to be used, and turn the terminal on.
2. Insert the TN771 circuit pack into the slot. The system does not recognize the presence of the circuit pack.

If the standalone mode is entered successfully, the following is displayed on the connected terminal:

```
TN771 STANDALONE MODE
(Type "?" at the prompt for help)





Command:
```

Figure 9-4. Normal Standalone Mode Display

CAUTION:
If the display in Figure 9-4 does not appear, be sure to check the wiring between the terminal and the TN771, and also the terminal parameters. If these are correct, the TN771 may be defective. In such a case, follow the procedures to exit standalone mode (described in the next paragraph). Then test the Maintenance/Test circuit pack (refer to M/T-BD and M/T-PKT in Chapter 11, "Maintenance Object Repair Procedures").

NOTE:
If the TN771 fails while in standalone mode, the message **TN771 circuit pack failed** is displayed, and no further input is accepted on the terminal. The circuit pack must be replaced.

Use the following procedures to exit standalone mode:

1. Remove the 258A Adapter from the Amphenol connector.
2. If the TN771 was installed for this procedure, remove it. Otherwise, reseat the TN771.
3. Be sure that alarm origination is re-enabled on the ‘‘Maintenance-Related System Parameters’’ form if it was disabled there (if it was disabled at login, it is automatically re-enabled at logoff).

Using Standalone Mode in Packet Bus Fault Isolation and Correction

When the TN771 is in standalone mode, three commands can be used at the terminal:

- **ds** displays the current state of the Packet Bus leads.
- **dsa** toggles auto-report mode on and off. In auto-report mode, the state of the Packet Bus leads are displayed and the terminal beeps whenever a change occurs.
- **?** displays the available commands.

Figure 9-5 presents an example of a standalone mode display. In the display, an 'S' indicates a shorted lead, an 'O' indicates an open lead, and a blank indicates no fault.

```
L L L L L L L L L L H H H H H H H H H H S S S L
P 0 1 2 3 4 5 6 7 8 P 0 1 2 3 4 5 6 7 8 S F B F
------------------------------------------------
S S                             O
Command:
```

Figure 9-5. Example Standalone Mode Display

The information within a standalone mode display is used in the Packet Bus Fault Correction procedures that follow. The TN771 display indicates the specific leads on the backplane to examine for bent or damaged pins. Figure 9-6 shows the location of the Packet Bus leads on the backplane as viewed from the front of the carrier, while Figure 9-7 shows the same slot as viewed from the back of the carrier.

NOTE:

This information is available only from the standalone mode and with an on-site connected terminal. This information is not available from the Manager I, and, thus, it is not available remotely. This is not a concern, inasmuch as this information cannot be used effectively if testing is not on site.

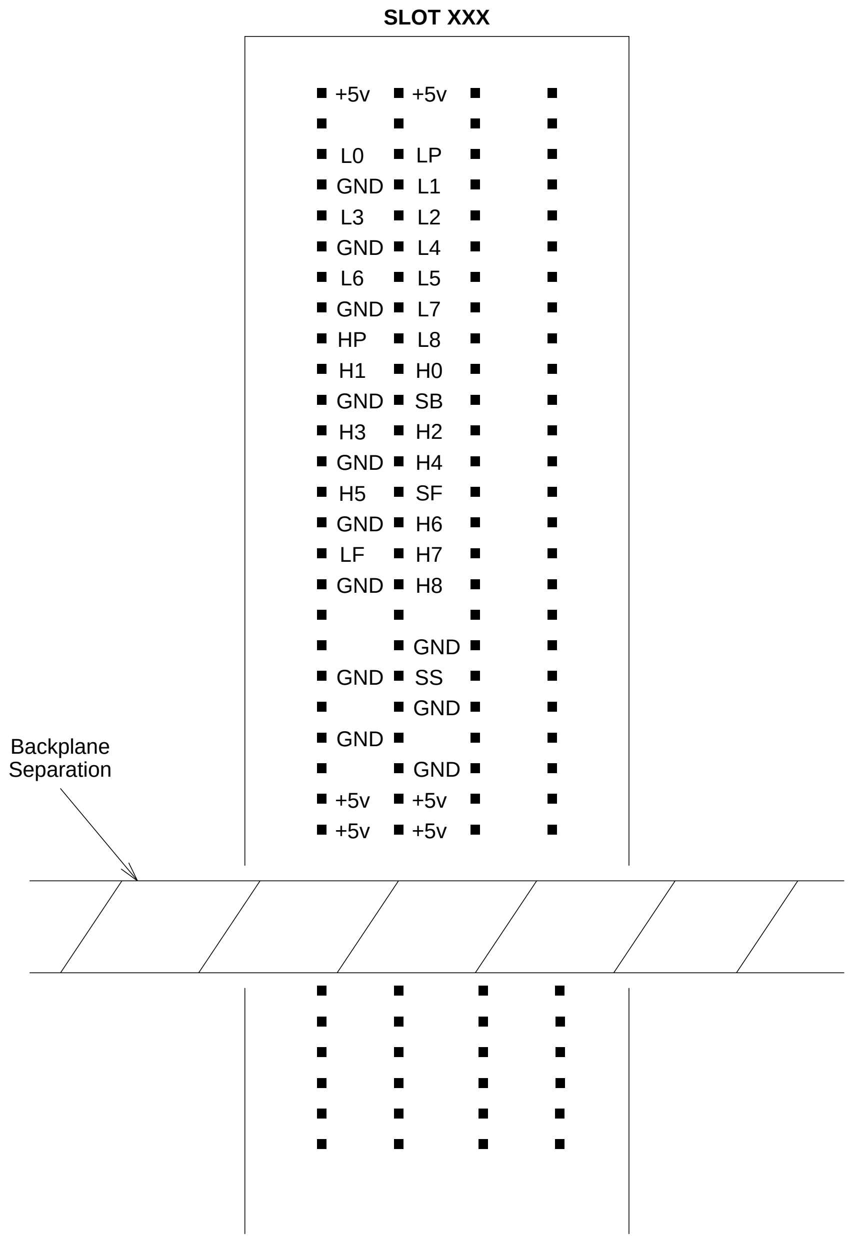


Figure 9-6. Packet Bus Leads on the Backplane - Front View

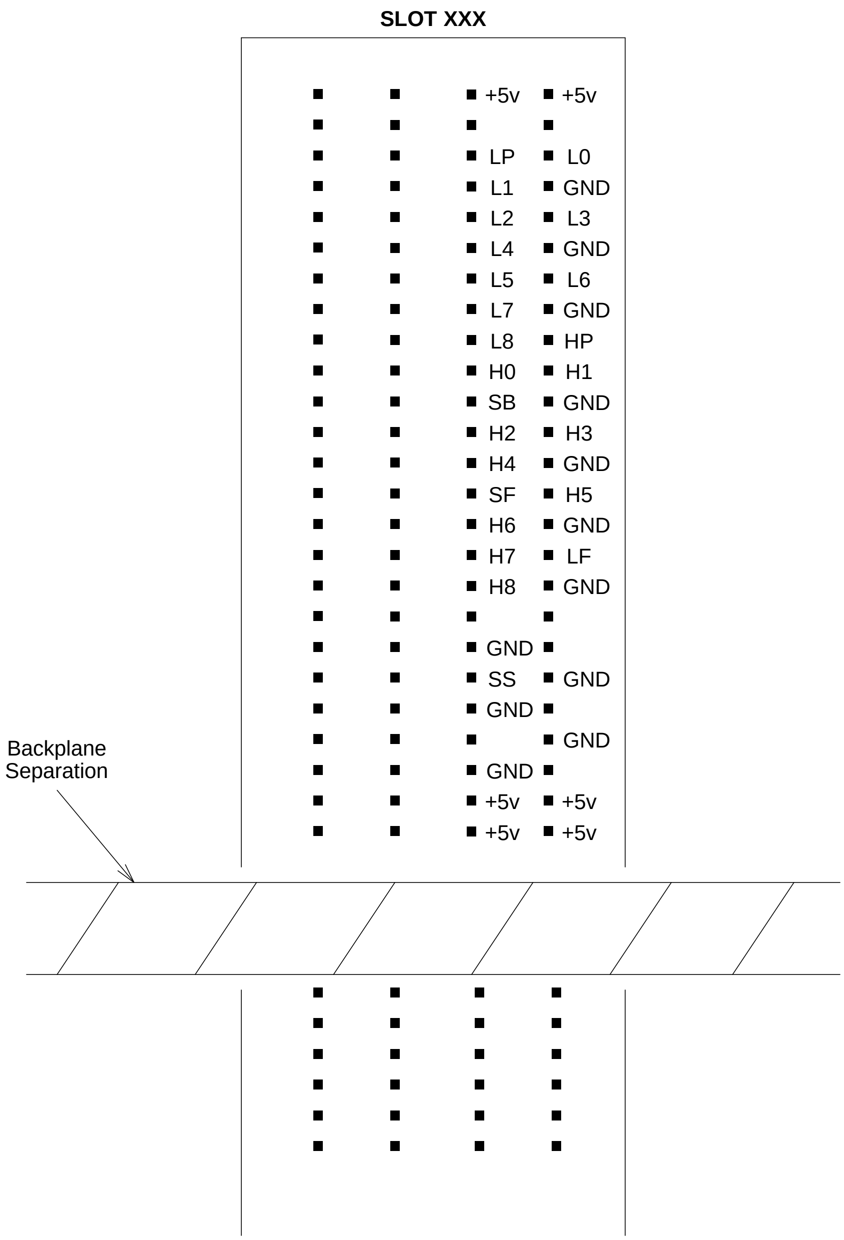


Figure 9-7. Packet Bus Leads on the Backplane - Back View

Special Precaution Concerning the TN771

A new TN771 Maintenance/Test circuit pack must be taken to the customer site whenever the following is true:

- Maintenance/Test Packet Bus port indicates that a Packet Bus fault is present.

  NOTE:
  Such a fault is indicated by a Major or Minor alarm against the Packet Bus. A Major alarm is indicated in the error log by Error Type 513, while a Minor alarm is indicated by Error Type 2049.

- Test #572 of the PKT-BUS test sequence is the only test that fails.

This precaution is taken because certain failures of the Maintenance/Test circuit pack can appear as Packet Bus failures. To ensure that the problem is indeed with the Packet Bus, implement the following steps:

1. Refer to the M/T-PKT Maintenance documentation in Chapter 11, "Maintenance Object Repair Procedures". Correct any problems with the TN771 Maintenance/Test Packet Bus port as described in that section. If the TN771 Maintenance/Test circuit pack is replaced during the correction process, enter the **test pkt P long** command to determine if the Packet Bus faults have been resolved. If there are still Packet Bus problems, correct them by using the procedures in the sections that follow.
2. If the Maintenance/Test circuit pack was not replaced, enter the **test pkt P** command. Record the results (PASS/FAIL/ABORT) and error codes for Test #572.
3. Enter the **status system P** command. Record the information listed for the Packet Bus.
4. Busyout the Maintenance/Test circuit pack by entering the **busyout board PCSS** command.
5. Replace the Maintenance/Test circuit pack with the new circuit pack.
6. Release the Maintenance/Test circuit pack by entering the **release board PCSS** command.
7. Enter the **test pkt P** and **status system P** commands as described in Steps 2 and 3.

8. If the data matches the previously recorded data, a Packet Bus problem exists. The original TN771 Maintenance/Test circuit pack is not defective, and it does not need to be returned to the factory. Replace the original TN771, then correct the Packet Bus problem by using the procedures in the sections that follow.
9. If the data does **NOT** match the previously recorded data, **the original TN771 Maintenance/Test circuit pack is defective.** If there are still indications of Packet Bus problems, correct them by using the procedures in the sections that follow.

Packet Bus Fault Isolation Flowchart

The flowchart in this section presents the steps to be taken for isolating and resolving Packet Bus problems. The order in which the maintenance objects should be examined can be determined by assessing how wide-spread the failure is. For example, since all ISDN-BRI devices communicate with the TN778 Packet Control circuit pack, this MO should be examined early in the sequence. On the other hand, a failure of a TN570 circuit pack in an EPN may cause ISDN-BRI failure in an EPN, but it could not be the cause of a failure in the PPN.

Whenever the flowchart refers to the Maintenance documentation for a specific MO, keep in mind that the repair procedure for that MO may in turn refer to another MO's repair procedure. The flowchart tries to coordinate these procedures so that a logical flow is maintained if the Packet Bus problems are not resolved via the first set of repair procedures. However, a Packet Bus failure can lead to a somewhat haphazard referencing of various MO procedures that may result in your implementing steps that either have already been completed or are not necessary. If this occurs, return to the flowchart at the step that follows the reference to Chapter 11, "Maintenance Object Repair Procedures", and then continue.

NOTE:
The following **status** commands can also help diagnose Packet Bus problems:

- **status system**
- **status packet-control**
- **status bri-port**
- **status station**
- **status data-module**

For a description of these commands, refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids". The commands provide information about the service state of various Packet maintenance objects. This information can be useful for remote maintenance, inasmuch it can explain the impact of the failure(s) on the system.

The Packet Bus Fault Isolation Flowchart appears on the following two pages.

NOTE:
See the "Flowchart Description and Supplement" section following the flowchart for a description of the flowchart as well as for supplementary information, the availability of which is indicated by the uppercase letters in bold that appear within some of the es and diamonds in the flowchart.

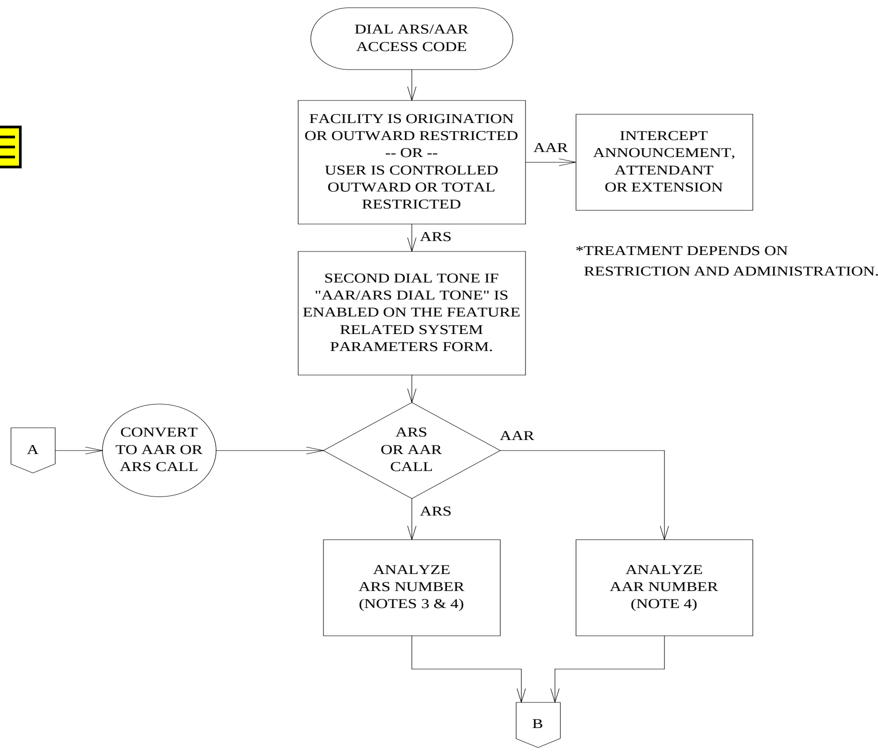


Figure 9-8. Processing of Packet Bus Problems (Page 1 of 2)

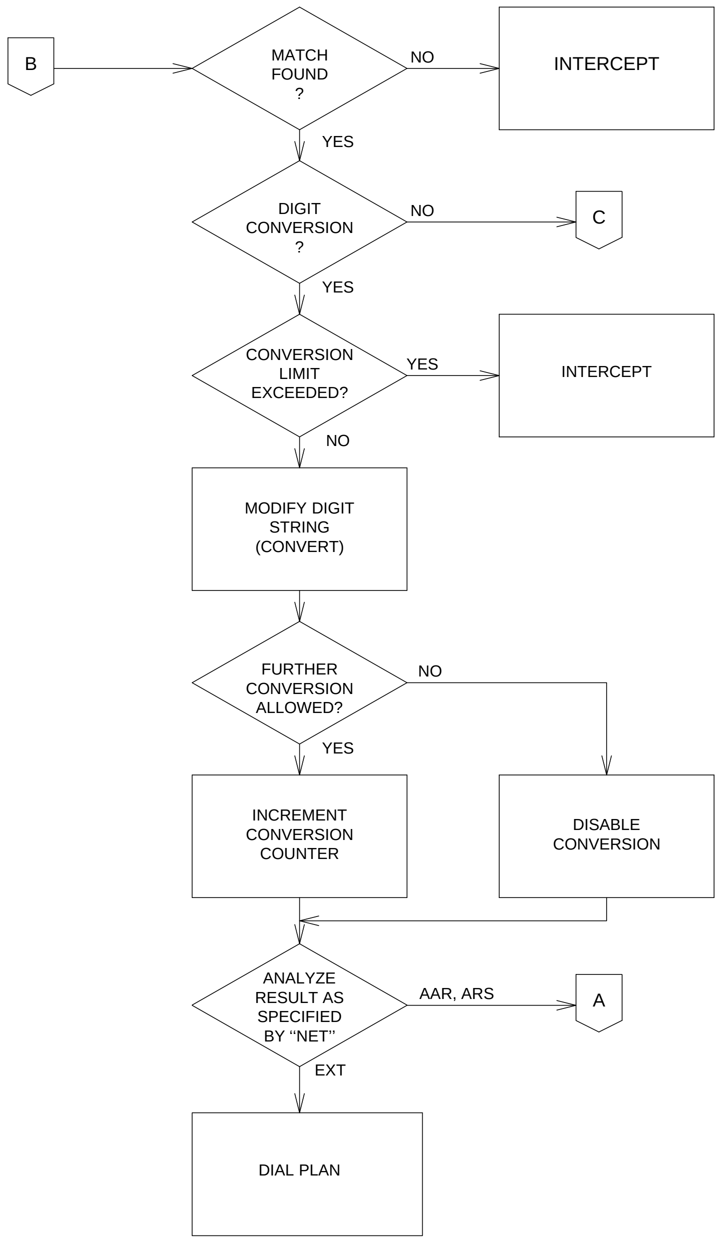


Figure 9-9. Processing of Packet Bus Problems (Page 2 of 2)

Flowchart Description and Supplement

A number of the es and diamonds in the flowchart contain an uppercase letter in bold (for example, **A, B, C,** etc.). Each of these es and diamonds is supplemented by the paragraph in this section that is introduced by the same letter that appears in the box or diamond. Each of these paragraphs gives details about the relevant process that could not fit into the appropriate box or diamond.

> **NOTE:**
> Due to space restrictions, individual error codes and alarms are not detailed on the flowchart. The maintenance object descriptions in Chapter 11, "Maintenance Object Repair Procedures", discuss which errors and alarms could cause or be indicative of Packet Bus problems. In general, unless an error, alarm, or test refers explicitly to the TDM Bus, the error, alarm, or test should be considered a possible cause of Packet Bus problems.

The following paragraphs supplement the appropriate or diamond in the flowchart.

a. Problems with the system clock (TDM-CLK) can cause service disruptions on the Packet Bus as well as on the TDM Bus. Therefore, if there are alarms active against TDM-CLK, these alarms should be resolved before any other Packet Bus fault isolation is attempted.

   > **NOTE:**
   > All TDM-CLK problems should be resolved before the process is continued, even if the problems refer only to the TDM Bus. (This is an exception to the previous note.) This is recommended because a Packet Bus problem cannot cause a TDM-CLK problem, while a TDM-CLK problem can cause a Packet Bus problem.

b. The question ‘‘Are the Packet Bus problems resolved?’’ appears several times on the flowchart. This is a general question that can involve several checks. The basic question is “Are the problems that caused you to use this flowchart resolved?’’ Some of the more specific questions might be:

   - Are all Packet Bus alarms resolved?
   - Are all Packet circuit pack (port, endpoint) alarms resolved?

     > **NOTE:**
     > If all alarms are resolved, issue the **clear pkt** command. This command attempts to put the switch back into the service state by resolving any BRI problems that exist. Refer to Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for more information.

- Are all ISDN-BRI stations/data modules and/or ASAI adjuncts in service?
- Does the Maintenance/Test Packet Bus port (in normal or standalone mode) still indicate a Packet Bus fault?

c. If only a single EPN is affected, the Packet Control is probably not the source of the problem. However, if all of the ISDN-BRI circuit packs are located in a single EPN, assume that the answer to this question is ‘‘No,’’ and check the Packet Control.

d. A Packet problem that affects more than one port network is probably caused by either a Packet Control failure or a PPN Packet Bus failure. The Packet Control is checked before the Packet Bus Fault Correction procedures are implemented.

e. Because the Packet Bus in each port network is physically separate, each affected port network must be checked individually. The PPN should be checked first, however, since any EPN Packet problems are usually resolved once the PPN Packet problem is resolved. After resolving the problem in one port network, be sure to check if the problems in other port networks have also been resolved.

f. This step applies only when an attempt to resolve an EPN Packet Bus problem is made. When checking the Expansion Interfaces in an EPN, be sure to check the corresponding ones in the PPN. Also, recall that all Expansion Interfaces in 286 systems, 386 systems, or later systems that are using the Packet Bus must be TN570s. Using TN776s results in an EPN where TDM traffic works but Packet traffic does not work.

g. If a TN771 is not present, one must be installed to accommodate the standalone mode, which is discussed earlier in this chapter.

h. If a TN771 is present, it can fail in such a fashion that it eventually disrupts the Packet Bus or misinterprets a Packet Bus problem.

i. If work is being done on-site, follow the procedures described earlier in this chapter for placing the TN771 into standalone mode. If work is not being done on-site, go to the next step.

j. The answer is ‘‘Yes’’ if the TN771 in standalone mode indicates any faulty leads. The answer is also “Yes’’ if Test #572 in the PKT-BUS test sequence fails, and/or if the **status system** display indicates that faulty leads are present (and the TN771 in the port network is known to be functioning correctly).

k. If the non-functional endpoints are isolated to a single circuit pack, the circuit pack is probably the cause of the problem.

l. The procedures that must be executed are determined by which maintenance objects on the circuit packs are alarmed. Start with the procedures for the circuit pack errors/alarms, then continue with those for the port. Finally, execute the procedures for the endpoint.

m. Follow the procedures outlined later in this chapter. If the Packet Bus problem cannot be resolved by executing these procedures, escalate the problem.

Packet Bus Fault Correction

Using and Interpreting Results from the Status System Command

The **status system** command can be issued to retrieve information about the Packet Bus. This command is described fully in the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

The **status system** command provides the service state, alarm status, and (if the Maintenance/Test Packet Bus port is activated) the number of faulty and open leads. This information can be used to determine the urgency of the repair. In general, a service state of ‘‘out’’ indicates extreme urgency, while a service state of ‘‘reconfig’’ indicates moderate urgency.

CAUTION:
Ultimately, the urgency of a repair is determined by the customer's requirements. A customer who uses ISDN-BRI for station sets probably considers a Packet Bus failure critical. However, a customer with only a small percentage of ISDN-BRI service may consider even an uncorrectable Packet Bus fault to be of minor importance and may prefer to delay performing repairs, due to their destructive nature.

NOTE:
If maintenance is actively running on the Packet Bus at the time the **status system** command is issued, the data reported for the Packet Bus may be inconsistent. The reason is that this data is updated by the maintenance tests that are running. If the data seems inconsistent, enter the command again.

If test results or the results of the **status system** command indicate that there are 24 faults on the Packet Bus, the problem is probably caused by faulty cables between carriers, or by defective bus terminators. However, before proceeding, make sure that the report is not being falsely given by the Maintenance/Test Packet Bus port. Accordingly, look for an M/T-PKT error in the error log. Then test the Maintenance/Test Packet Bus port by entering the **test port** command. Refer to the "Special Precaution Concerning the TN771" section earlier in this chapter if any problems are suspected.

If the carrier into which a TN771 Maintenance/Test circuit pack is installed does not have a -5 volt power supply, the Maintenance/Test Packet Bus port reports 24 open leads on the Packet Bus (via the **status system** command and via Test

#572 of the PKT-BUS test sequence). No failure of the TN771 is indicated in this case because the TN771 is not defective. Refer to CARR-POW maintenance in Chapter 11, "Maintenance Object Repair Procedures", and ensure that a -5 volt power supply is available.

Considerations for High and Critical Reliability Systems

If a High or Critical Reliability system is involved, special considerations involving the features of this type of system must be kept in mind. In particular, if a Packet Bus problem is caused by a duplicated component, switching to the standby component may both alleviate the problem and isolate the faulty circuit pack. Therefore, the commands in the following list should be executed first in a High or Critical reliability system. For more information on these commands, refer to Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

- **reset system interchange**. If this command resolves the Packet Bus problem, the problem is with the Packet Control in the (new) standby SPE. Refer to PKT-CTRL maintenance in Chapter 11, "Maintenance Object Repair Procedures".
- **set exp-link**. If this command resolves the Packet Bus problem, the problem is with either the (new) standby EI Link or the EIs at either end. Refer to EXP-INTF maintenance in Chapter 11, "Maintenance Object Repair Procedures".
- **set tone-clock**. If this command resolves the Packet Bus problem, the problem is with the (new) standby Tone-Clock. Refer to TDM-CLK maintenance in Chapter 11, "Maintenance Object Repair Procedures".

NOTE:
Keep in mind that, even though the steps discussed in the previous list may fail to resolve the problem, the steps are not necessarily fault-proof. Continue with the procedures in the next section.

Troubleshooting Procedures

As we discussed earlier in this chapter, Packet Bus faults are usually caused by a defective circuit pack connected to the backplane, by bent pins on the backplane, or by defective cables/terminators that make up the Packet Bus. The first two faults cause shorts, while the third fault causes either shorts or opens.

There are four procedures for correcting Packet Bus faults. The number of procedures that are to be used to correct faults depends upon a number of factors relevant to system performance and to the content of the procedures themselves. For example, if the Maintenance/Test Packet Bus port is activated, and if there is an indication of open leads on the Packet Bus (either via the **status system** command or via Test #572 failure), **go directly to Procedure 4**. The reason for this is that Procedures 1 through 3 try to locate faulty circuit packs or bent pins behind circuit packs. Since these types of failures can never cause open faults, Procedures 1 through 3 need not be implemented in this case. However, if there are both shorts and opens, execute Procedure 4, then return to Procedure 1 if there are still shorts after the open lead problems are resolved.

CAUTION:
Since Packet Bus fault isolation procedures involve removing circuit packs and possibly disconnecting entire carriers, these procedure have a profound effect on service. Therefore, if possible, implement these procedures after hours or during hours of minimum system use.

NOTE:
Each of these procedures contains one or more steps that require a determination as to whether the Packet Bus problem has been resolved. Accordingly, several condition checks must be performed. We can present each such check in the form of a question, as follows:

- Did the Maintenance/Test circuit pack standalone mode initially indicate the existence of faulty leads, and are these leads no longer indicated?
- Have all alarms against the Packet Bus and Packet circuit packs been resolved?

  NOTE:
  If all alarms are resolved, issue the ‘‘clear pkt’’ command. This command attempts to put the switch back into the service state by resolving any BRI problems that exist. Refer to Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for more information.

- Are all ISDN-BRI stations and data modules as well as any relevant ASAI adjuncts in service?

Note that if one of these conditions is not yet met, the others need not be checked.

The following sections discuss the four procedures for correcting Packet Bus faults.

Procedure 1

Procedure 1 determines if any circuit packs that use the Packet Bus have faults. For each circuit pack type (see Table 9-1), perform the following steps:

NOTE:
The circuit packs need not be checked in the order presented **if the flowchart in this chapter has been followed**. However, if newly added circuit packs are involved, check these packs first, inasmuch as the packs are most likely to have caused a problem.

1. Display the Error and Alarm Logs for the circuit pack via the **display errors** and **display alarms** commands.
2. If there are errors for the circuit pack, refer to the appropriate aintenance documentation in Chapter 11, ''Maintenance Object Repair Procedures'', and follow the recommended maintenance procedure to resolve the errors. Note that some of these procedures may refer to PKT-BUS maintenance as the cause of the fault; if so, implement these Packet Bus Fault Correction procedures at that point.
3. After implementing the repair procedure for the circuit pack (and regardless of whether this procedure succeeds or fails), determine if the Packet Bus fault is still present.
4. If the Packet Bus fault is still present, implement Procedure 1 for the next circuit pack.
5. If there are no more circuit packs in the list, go to Procedure 2.
6. If the Packet Bus fault has been resolved, the procedures are completed.

Table 9-1. Packet Circuit Packs

Circuit Pack Name	Circuit Pack Code	Associated Maintenance Objects
ISDN-BRI	TN556	BRI-BD, BRI-PORT, ABRI-PORT, BRI-SET, BRI-DAT, ASAI-ADJ
Maintenance/Test	TN771	M/T-BD, M/T-PKT
Packet Control	TN778	PKT-CTRL
Expansion Interface	TN570	EXP-INTF

Procedure 2

Procedure 2 removes and reinserts port circuit packs (those in the purple slots) one or several at a time. Use Procedure 2 for each port circuit pack in the port network until either (1) the problem is resolved or (2) there are no more circuit packs in the port network.

NOTE:
This procedure should also be used for the TN570 Expansion Interface circuit pack in a standard system. For a High or Critical Reliability system, refer to Procedure 3 for the Expansion Interface circuit pack. Also, refer to Procedure 3 for the TN768 or TN780 Tone-Clock circuit pack in a switch with a High or Critical Reliability system.

CAUTION:
The Expansion Interface circuit pack should be the last one checked in this procedure, since removing this circuit pack disconnects its EPN. The

Tone-Clock circuit pack should be the next-to-last one checked. In addition, the TN771 must be reseated after the Tone-Clock is reinstalled.

If the Packet Bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot caused the problem. If the backplane pins are intact, replace the circuit pack.

NOTE:
In a multiple failure situation, the circuit pack could be one cause of the Packet Bus problem. However, there could also be other failures that are causing Packet Bus faults.

In Procedure 2, an option of working either with one circuit pack at a time or with multiple circuit packs simultaneously is available. In view of this, determine the level of service interruption to be allowed during this procedure. If causing a disruption to all users in the port network is deemed permissible, large groups of circuit packs should be worked with. This option allows faster job completion. **However, if large service disruptions are to be avoided, work with one circuit pack at a time**. This option is slower, but it disrupts only the users of a single circuit pack.

CAUTION:
If the TN771 Standalone mode does NOT indicate Packet Bus faults, perform Procedure 2 for ONLY the port (purple) slot Packet circuit packs listed in Table 9-1. Also, problems with the backplane pins need not be checked for. Determining if the problem is resolved by removing circuit packs is sufficient.

Here are the steps for Procedure 2:

1. Remove one or several circuit packs as appropriate, according to the considerations presented in the previous paragraphs. Any circuit pack(s) (whether Packet or non-Packet) that have been recently inserted should be checked first. It is likely that such a circuit pack caused a new problem. Keep in mind that Packet circuit packs should be checked before non-Packet circuit packs.

   If the decision is made to remove multiple circuit packs, consider working with an entire carrier at a time to ensure a good granularity.

2. Determine if the Packet Bus fault is still present.
3. If the Packet Bus fault is still present:
   - Determine if the backplane pins in the removed circuit pack's slot are bent. Use the output from the Maintenance/Test standalone mode and Figure 9-6 and Figure 9-7.

- If the backplane pins are bent, power down the carrier (refer to the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures", straighten or replace the pins, reinsert the circuit pack, restore power (refer to the "Restoring Power" section in Chapter 5, "Routine Maintenance Procedures", and repeat Procedure 2, beginning with Step 2, for the same circuit pack.

WARNING:
If this is a High or Critical Reliability system, and if the slot is in the Active control carrier, perform an SPE interchange before changing the circuit pack. Follow the procedures presented in Chapter 8, "Reliability Systems: A Maintenance Aid".

- If the backplane pins are not bent, reinsert the circuit pack(s), and perform Procedure 2 for the next set of circuit packs.

4. If the Packet Bus fault is not present, do the following:
   - Reinsert a circuit pack. If multiple circuit packs have been removed, reinsert the circuit packs **one at a time**, and repeat the following substeps until all of the circuit packs have been reinserted.
   - Determine if the Packet Bus fault has returned.
   - If the Packet Bus fault has returned, the reinserted circuit pack is defective. Replace the circuit pack and then continue.
   - If the Packet Bus fault does not return when all of the circuit packs have been reinserted, the procedure is completed.

Continue with Procedure 3 if all the port circuit packs have been checked, but the Packet Bus fault is still not resolved.

Procedure 3

Procedure 3 removes and reinserts control carrier circuit packs one at a time. The Packet Control, Tone-Clock, and Expansion Interface circuit packs are the only processor complex circuit packs that communicate on the Packet Bus. In addition, the Memory 1 and EPN Maintenance Board circuit packs are connected to the Packet Bus in the backplane (while the Memory 2 circuit pack is not). Therefore, these are the only processor complex circuit packs that are likely to cause a Packet Bus problem in a stable system. As a result, Procedure 3 should be performed only on the Packet Control, Memory 1, and EPN Maintenance Board circuit packs in all systems, and on the Expansion Interface and Tone-Clock circuit packs in High and Critical Reliability systems.

CAUTION:
If the TN771 Standalone mode does NOT indicate Packet Bus faults, perform Procedure 3 for ONLY the Packet Control, Expansion Interface, and Tone-Clock circuit packs. Also, problems with the backplane pins need not

be checked for. Determining if the problem is resolved by removing circuit packs is sufficient.

In a system without High or Critical Reliability, do the following:

1. Power down the control carrier. Refer to the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures".
2. Remove the suspect circuit pack.
3. As in Procedure 2, determine if the backplane pins in the removed circuit pack's slot are bent.
4. If the backplane pins are bent, do the following:
   a. Straighten or replace the pins
   b. Insert the same circuit pack
5. If the backplane pins are not bent, replace the circuit pack (reinsert the circuit pack if a replacement is not available).
6. Turn the power back on to reboot the system. Refer to the "Restoring Power" section in Chapter 5, "Routine Maintenance Procedures".
7. Determine if the Packet Bus fault is still present.
8. If the Packet Bus fault is still present, do the following:
   a. If the circuit pack was reinserted in Step 5, replace the circuit pack, and repeat Procedure 3.
   b. If the circuit pack was replaced in Step 5, repeat Procedure 3 for the next processor complex circuit pack.
9. If the Packet Bus fault does not recur, the procedure is completed.

If Procedure 3 fails to identify the cause of the problem, go to Procedure 4.

In a High or Critical Reliability System, do the following:

1. If the circuit pack to be replaced is in the SPE, perform an SPE interchange by entering the **reset system interchange** command. For an Expansion Interface circuit pack, enter the **set exp-link** command to switch to the standby expansion link. For a Tone-Clock circuit pack, enter the **set tone-clock** command to switch to the standby Tone-Clock circuit pack.
2. Remove the newly-inactive suspect circuit pack. For a circuit pack in the processor complex, use the procedures in Chapter 8, "Reliability Systems: A Maintenance Aid".
3. As in Procedure 2, determine if the backplane pins in the removed circuit pack's slot are bent.

4. If the pins are bent, do the following:
   a. Power down the carrier. Refer to the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures".
   b. Straighten or replace the pins.
   c. Insert the same circuit pack.
   d. Restore power to the carrier. Refer to the "Restoring Power" section in Chapter 5, "Routine Maintenance Procedures".
5. If the backplane pins are not bent, insert or replace the circuit pack.
6. Determine if the Packet Bus fault is still present.
7. If the Packet Bus fault is still present, do the following:
   a. If the circuit pack was reinserted in Step 5, replace the circuit pack. Then repeat Procedure 3, starting at Step 2.
   b. If the circuit pack was replaced in Step 5, continue with Step 9.
8. If the Packet Bus fault does not recur, the procedure is completed.
9. If the suspect circuit pack has been tested in the other control carrier, go to Step 10. Otherwise, implement Step 1, then Steps 2 through 8.
10. Repeat the procedure in the previous step for the next suspect circuit pack.

If all processor complex circuit packs have been checked and the problem is not resolved, continue with Procedure 4.

Procedure 4

Procedure 4 tries to isolate the failure to a particular set of carriers. Only the circuit packs in those carriers are checked. Procedure 4 is used if the preceding procedures fail, because it can help locate multiple circuit pack failures as well as failures of the carrier hardware. The procedure is also used if there are open leads on the Packet Bus. (The faults detected by Procedures 1 through 3 cannot cause open leads.)

In Procedure 4, the TDM/LAN Cable Assemblies and TDM/LAN termination resistor packs are replaced. If this action does not resolve the Packet Bus fault, the carriers are reconfigured by moving the termination resistor packs in such a manner that certain carriers are disconnected from the bus. This is done by moving the termination resistors on the carrier backplanes. To terminate the Packet Bus at the end of a particular carrier, first unplug the cable that connects the carrier to the next carrier and then replace the cable with a termination resistor (see Figure 9-9). When the length of the Packet Bus is modified via this procedure, circuit packs that are essential to system operation (for example, Processor Complex, Tone-Clock) must still be connected to the new ‘‘shortened’’ Packet (and TDM) Bus. In addition, the Maintenance/Test circuit pack (in standalone mode) must be connected to the ‘‘shortened’’ bus.

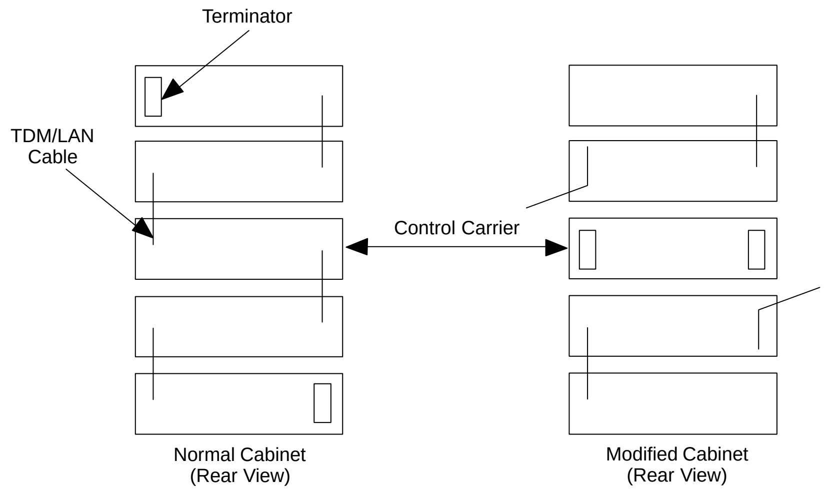


Figure 9-10. Carrier Rewiring Example

WARNING:
Power must be removed from the entire port network before any cables or terminators are removed. Failure to do so can cause damage to circuit packs and power supplies and can be hazardous to the technician. After cabling changes are made and verified, power must be restored to the port network. Use the TN771 Standalone mode to determine if the Packet Bus fault is resolved.

CAUTION:
Circuit packs in carriers that are not part of the shortened bus are not inserted. As a result, these circuit packs are not alarmed. Ignore these alarms for now. All alarms should be resolved when the cabinet is restored to its original configuration.

Procedure 4 is organized into two parts, as follows:

Part 1:

1. Power down the port network. Refer to the "Removing Power" section in Chapter 5, "Routine Maintenance Procedures".
2. Replace all of the TDM/LAN Cable Assemblies and both TDM/LAN Terminators.

3. Restore power to the port network. Refer to the "Restoring Power" section in Chapter 5, "Routine Maintenance Procedures".
4. Determine if the Packet Bus fault is still present.
5. If the Packet Bus fault is resolved, the procedure is completed. Otherwise, go to Part 2.

Part 2:

(Steps for a Processor Port Network):

1. Terminate the Packet Bus so that it extends only from the Active control carrier (that is, the carrier that contains the Active SPE) to the carrier that contains the Maintenance/Test circuit pack. To allow this procedure to isolate the failure to the smallest possible number of carriers, place the Maintenance/Test circuit pack into a carrier that contains a processor complex, if possible.
2. Determine if the Packet Bus fault is still present. If so, and if there are shorts on the Packet Bus, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers that are connected to the "shortened" Packet Bus. (Procedure 2 is performed for port circuit packs, and Procedure 3 is performed for processor complex circuit packs.)
3. If the Packet Bus fault is not present, extend the Packet Bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, and if there are shorts, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.
4. If the Packet Bus fault recurs as the Packet Bus is extended, and if Procedures 2 and 3 (if performed) do not resolve the problem, the added carrier(s) that caused the problem to recur are defective and must be replaced.

(Steps for other Port Networks):

1. Terminate the Packet Bus so that it extends only from the carrier that contains the Active Expansion Interface to the nearest carrier that contains the Maintenance/Test circuit pack. Place the Maintenance/Test circuit pack into a carrier that contains an Expansion Interface circuit pack in order to allow the procedure to isolate the failure to the smallest possible number of carriers.
2. Determine if the Packet Bus fault is still present. If so, and if there are shorts on the Packet Bus, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers that are connected to the "shortened" Packet Bus.
3. If the Packet Bus fault is not present, extend the Packet Bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, and if there are shorts, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.

4. If the Packet Bus fault recurs as the Packet Bus is extended, and if Procedures 2 and 3 (if performed) do not resolve the problem, the added carrier(s) that caused the problem to recur are defective and must be replaced.

If the Packet Bus problems are still not resolved, escalate the problem.

Maintenance Commands and Trouble-Clearing Aids

10

General

This chapter provides additional trouble-clearing information for resolving both system-alarmed and user-reported troubles. This chapter supplements the information found in Chapter 11, "Maintenance Object Repair Procedures". The information consists of using the maintenance commands as trouble-clearing aids. The maintenance commands are used to control, test, and obtain information associated with maintenance objects (MOs). The commands require the use of the administration terminal or remote Initialization and Administration System (INADS) interface (a valid login and password to perform maintenance are required).

In this chapter, the commands are first identified and organized into categories. Thereafter, each command is described individually.

Maintenance Commands

Maintenance commands entered at the administration terminal or by the INADS provide a means of demand testing, monitoring, or controlling maintenance objects in the system. The commands are classified as follows:

- Busyout/Release
- Cancel
- Change
- Clear
- Copy
- Disable
  — Disable Synchronization-Switch (see "Set Commands")
- Display
- Download
- Enable
  — Enable Synchronization-Switch (see "Set Commands")
- Get
- List
- Mark Port
- Monitor
- Recycle Carrier
- Refresh
- Release
- Reset
- Restore
- Resume
- Save
- Set
- Status
- Test (See "Test Command" section of this chapter for details.)
- Upgrade Software

In general, a maintenance object or other system entity can be acted upon by only one command at a time. This restriction applies to action commands such as:

- — busyout
- — change
- — clear
- — recycle
- — release
- — set
- — test
- — display
- — status
- — get
- — monitor

Error codes are provided in the test results for the **test**, **reset**, **busyout**, and **recycle** commands.

NOTE:
Any maintenance command keyword (action/object/qualifier) can be abbreviated as long as enough letters are present in the command word to distinguish that word from all other legal possibilities. For example, "r," "re," and "rep" are all legal abbreviations for "repeat" as used in the **test** commands.

Command Groups

This section identifies the command groups, and it list the commands within each group. If applicable, the appropriate error codes are also provided.

Busyout/Release Commands

The busyout/release commands are used to busyout and return to operation the following maintenance objects:

- Access Endpoint (access-endpoint)
- CDR Link (cdr-link)
- CMS Link (mis)
- Data Modules (data-module)
- Journal Printer (journal-printer)
- Links (link)
- Modem Pool (modem-pool)
- Packet Control (packet-control)
- PMS Link (pms-link)
- Port Circuit Packs (port)
- Port Circuit Packs (board)
- PRI Endpoint (pri-endpoint)
- SPE Standby (spe-standby)
- System Printer Link (sp-link)
- TDM Bus (tdm-bus)
- Tone-Clocks (tone-clock)
- Trunks/Trunk Groups (trunk)
- Voice Terminal Extensions (station)

Busyout Commands: Any of the above MOs that are administered can be busied out, provided they have been installed. If a circuit pack is not physically installed, and you try to busyout that circuit pack, the message "board not assigned" is displayed (except for the Packet Control circuit pack in which case "Packet Bus use not enabled (no Packet Control)" is displayed instead). The result of the **busyout** command is that the MO is placed in a maintenance busy state until it is released by the **release** command. This prevents call processing software from using the busied-out resource. In addition, a warning alarm is logged to indicate the busied-out status.

In a system with the duplication option, a busyout of the links (PI-LINK), Network Control Circuit Pack data modules (DATA-CHL), and the Packet Control

(PKT-CTRL) are preserved across an SPE interchange. When an SPE interchange occurs, and one of the MOs is busied out, the busyout command is transferred to the corresponding MO on the new active SPE while the MO on the former active SPE is released.

NOTE:
All busied-out MOs can be displayed by entering Error Type 18 in the Error Type field of the Hardware Errors Report Form.

Release Commands: These commands are used to release the MOs busied out by the **busyout** command. The results of a **release** command are displayed at the administration terminal or at the INADS. If the MO is not installed, the "board not assigned" message is displayed (except for the Packet Control circuit pack in which case "Packet Bus use not enabled (no Packet Control)" is displayed instead).

Otherwise, the results are the same as those for the **busyout** command described previously. The warning alarm generated by the **busyout** command is resolved.

Screen 10-1 [G1] and Screen 10-2 are examples of typical busyout command results.

```
                                                   Page 1

busyout port 2e0401

Port      Maintenance Name     Result     Error Code

2E0401      ANL-LINE             PASS
```

Screen 10-1. Busyout Command Results [G1]

```
                                                    Page 1

busyout port 2e0401
                              COMMAND RESULTS

Port      Maintenance Name   Alt. Name   Result     Error Code

2E0401      ANL-LINE            1009       PASS
```

Screen 10-2. Busyout Command Results

The following information is contained in the results:

- **Port:** Maintenance object's physical location—port network number (1 for PPN or 2 or 3 for EPN), carrier, slot number, port number for ports, and channel number for data channels. If the port network number is not entered in the command, then the system assumes a 1 for the PPN.

  NOTE:
  All port numbers busied out are listed.

- **Maintenance Name:** Maintenance object's logical name.
- **Alt. Name:** The alternate means of identifying the maintenance object. This field contains the extension when the object is a station or data module, and it contains xx/yy when the object is a trunk, where xx is the trunk group number and yy is the member number. It contains P/xx when the object is a Private Co line, where xx is the Private Co line group number.
- **Result:** The results of the command for each port busied out—"PASS" or "FAIL," or "ABORT."
- **Error Code:** A system-generated number that tells why a **busyout** or **release** command failed. See Table 10-1.

Busyout/Release Error Codes

Table 10-1 contains common error codes that can be returned from any **busyout** or **release** command when a failure or an abort is returned.

Table 10-1. Busyout/Release Command Error Codes

Error Code	Test Result	Description/ Recommendation
0	ABORT	Internal system error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If command still aborts, then escalate the problem.
1010	ABORT	Attempt was made to busyout an object that was already busied out.
1011	ABORT	Attempt was made to release an object that was not first busied out.
1026	ABORT	Cannot busyout this TDM Bus because control channel or system tones are present. If this is a High or Critical Reliability System, use the **set tdm PC** command to switch TDM Buses. Then this TDM Bus may be busied out.
2012 2500	ABORT	Internal system error.
2100	ABORT	System resources unavailable. 1. Retry the command at one-minute intervals a maximum of five times. 2. If command still aborts, then escalate the problem.

Continued on next page

Table 10-1. Busyout/Release Command Error Codes — *Continued*

Error Code	Test Result	Description/ Recommendation
62524 62525 62526	ABORT	System resources required to begin maintenance activity on this MO are unavailable. Maintenance is currently active on the maximum number of maintenance objects that the system can support. A typical reason for this condition is that the system contains a large number of stations and/or trunks that have been administered but that are not physically connected. However, the circuit packs on which they have been administered are physically present in the system. 1. Resolve as many alarms as possible on the station and trunk MOs or busyout these MOs to stop maintenance activity on them. 2. Rerun the test.
	NO BOARD	Circuit pack has been removed. Cannot busyout/release object.
	FAIL	Object could not be busied out or released.
	PASS	Object successfully busied out or released.
	EXTRA BD	Certain circuit packs have limitations on how many circuit packs can be in the system or port network such as the Maintenance Test Circuit Pack (TN771), the Tone Detector Circuit Pack (TN748B, TN748C or TN748D) and the Call Classifier (TN744). The Maintenance Test Circuit Pack allows only one circuit pack per port network. The Tone Detector and the Call Classifier allow only 10 circuit packs in each system. All additional circuit packs return EXTRA-BD and should be removed.

CMS LINK (mis)

Command: **busyout** (or **release**) **mis**

DATA MODULE (data-module)

Command: **busyout** (or **release**) **data-module** "qualifier"

Qualifier:

Data Module extension number (for example, 3277)

JOURNAL PRINTER (journal-printer)

Command: **busyout** (or **release**) **journal-printer** "qualifier"

Qualifier: **pms-log** or **wake-up log**

LINK (link)

Command: **busyout** (or **release**) **link** "qualifier"

Qualifier: Link number (**1, 2, 3, 4, 5, 6, 7,** or **8**). Links 1 through 4 reside on Processor Interface circuit pack "1a1" or "1b1" and links 5 through 8 reside on Processor Interface circuit pack "1a2" or "1b2."

MODEM POOL (modem-pool)

Command: **busyout** (or **release**) **modem-pool** "qualifier"

Qualifier: Modem pool group number (**1, 2, 3, 4,** or **5**) followed by a slash (/) and the member number (**1** through **16**), for example 2/4. If the modem pool group number only is entered, all members in the group are busied out.

PACKET CONTROL (packet-control)

Command: **busyout** (or **release**) **packet-control** "qualifier"

Qualifier: In a standard system, no qualifier is required. In a system with High or Critical Reliability, the carrier that contains the Packet Control circuit pack to be busied out or released must be specified as "a" or "b."

NOTE:
Only the Packet Control circuit pack in the Active carrier may be busied out or released; if the Standby carrier is specified, an error message is displayed.

PMS LINK (pms-link)

Command: **busyout** (or **release**) **pms-link**

PORT (port)

Command: **busyout** (or **release**) **port** "qualifier"

Qualifier: Location of port on port circuit pack (for example, 2b0401)

PORT CIRCUIT PACK (board)

Command: **busyout** (or **release**) **board** "qualifier"

Qualifier: Circuit pack location for port circuit pack (for example, 2b04)

CDR-LINK (cdr-link)

Command: **busyout** (or **release**) **cdr-link** "qualifier"

Qualifier: **primary** or **secondary**

SYSTEM PRINTER LINK (sp-link)

Command: **busyout** (or **release**) **sp-link**

TDM BUS (tdm-bus)

Command: **busyout** (or **release**) **tdm** "qualifier"

Qualifier: The port network number (**1** for PPN or **2** or **3** for EPN) and the TDM Bus number **a** or **b** (for example, 1a).

TONE-CLOCK (tone-clock)

Command: **busyout** (or **release**) **tone-clock** "qualifier"

Qualifier: The port network number (**1** for PPN or **2** or **3** for EPN) and the carrier that contains the Tone-Clock circuit pack to be busied out or released (identified as **a** or **b**), for example 1a. The "b" carriers only contain Tone-Clock circuit packs when the system is equipped with High or Critical Reliability.

TRUNK/TRUNK GROUP (trunk)

Command: **busyout** (or **release**) **trunk** "qualifier"

Qualifier: Trunk group number followed by a slash (/) and the member number (for example, 40/3). If only the trunk group number is entered, all trunks in the group are busied out.

VOICE TERMINAL EXTENSION (station)

Command: **busyout** (or **release**) **station** "qualifier"

Qualifier: Terminal extension number (for example, 3277)

Cancel Commands

There is only one cancel command (hardware-group).

Change Commands

The **change** command is used to change the following:

- Circuit Packs (circuit-packs)
- Maintenance-Related System Parameters (system-parameters maintenance).
- Synchronization (synchronization)

NOTE:
This command is described in the "Maintenance-Related System Parameters Form" section of Chapter 5, "Routine Maintenance Procedures"

Clear Commands

The **clear** command is used to clear the following:

- Audits (audits)
- Errors (errors)
- Interface (interface)
- ISDN test call (isdn-testcall)
- Link (link)
- MST (mst)
- Packet Bus (pkt)
- Port (port)

Copy Update-File Command

In a High or Critical Reliability System only, the **copy update-file** command provides a mechanism for copying an update file from the Active SPE's tape to the Standby SPE's tape provided that the file on the Active SPE's tape is newer than the one on the Standby SPE's tape.

NOTE:
This command is only available to INADS.

Disable Commands

The **disable** commands are used to suspend the activity of the following:

- Administered Connection (administered-connection)
- MST (mst)

- Synchronization Switch (synchronization-switch)
- Test Number (test-number)

NOTE:
System Technician-demanded testing is not permitted. A test that has been disabled is displayed as "disabled" in the test results.

The **disable MO** and **disable test** commands listed above is used by Lucent Technologies.

Tier 3 and Tier 4 maintenance organizations to suspend system maintenance on one or all of the MOs or on the tests in the system. While maintenance is suspended on an MO, periodic and scheduled maintenance are not performed and in-line error reports are ignored. System Technician-demanded testing is permitted, but all such test results are ignored. When a test has been disabled, an attempt to execute the disabled test produces a "disabled" test result. The **display disabled-tests** command can be used to determine which (if any) tests have been disabled.

The **disable** command is not a true "trouble-clearing" aid, but rather is designed to troubleshoot a suspected problem with system maintenance. If it is believed that system maintenance is causing a problem, then the **disable** command can be used by the appropriate level of technical maintenance support to turn off maintenance on a particular MO or to prevent the execution of a particular test.

For detailed information on how and when to use the **disable** command, contact the next higher level maintenance support.

The second **disable** command listed above is the **disable synchronization-switch** command. This command is used to suspend the ability of Synchronization Maintenance to switch between synchronization references.

Display Commands

The **display** commands are used to display the following items:

- Alarm Log (alarms)
- Communication Interface (communication-interface)
- Current Time (time)
- Disabled Tests (disabled-tests)
- Error Log (errors)
- Initialization Causes (initcauses)
- Maintenance-Related System Parameters (system-parameters maintenance)

- Port Information (port)
- Synchronization (synchronization)
- Vector Events (events)

Download Command

There is only one download command (update-file).

Enable Commands

The **enable** commands are used to restart the previously suspended maintenance activity or operation of the following:

- Administered Connection (administered-connection)
- MST (mst)
- Synchronization Switch (synchronization-switch)
- Test Number (test-number)

The **enable** command is used to restart system maintenance on one or all of the maintenance objects in the system that have been disabled via the **disable** command. The **enable** command is also used to allow specific maintenance tests that were previously disabled to run again. See the "Disable Commands" description in this chapter for more details.

The **enable synchronization-switch** command is used to restore the ability of Synchronization Maintenance to switch between synchronization references.

Get Command

There is only one get command (vector).

List Commands

The **list** commands are used to list data for the following:

- Configuration Reports (configuration)
- Disabled MOs (disabled-MOs)
- History (history)
- ISDN-PRI Test Calls (isdn-testcall)
- Marked Ports (marked-ports)
- Measurements (measurements)

- MST (mst)
- Test Calls (testcalls)

  NOTE:
  This command should only be used with Tier 3 and Tier 4 assistance.

Mark Command

There is only one mark command (port).

Monitor Command

The monitor commands provide an on-line System Status Report that is continuously updated. The status report is displayed until the command is canceled. If the command is canceled, the user is logged off automatically. This feature prevents unauthorized use of the administration terminal when it is left unguarded. This command is not available to the "inads" login. The monitor commands are used to monitor the following items:

- BCMS (bcms)
- Health (health)
- Security Violations (security-violations)
- System (system)
- Traffic (traffic)
- Trunk (trunk group member)

Recycle Carrier Command

This command (recycle carrier) recycles the power on one specific carrier. When a power unit is replaced in a carrier, this command must be entered to recycle the power on that carrier.

Refresh Command

This command (spe-standby) allows the system technician to return the Standby processing element that is in the Maintenance Mode to the Standby Mode. The Standby processing element’s memory is refreshed from the contents of the Active processing element’s memory.

Release Commands

The **release** commands are used to release the following items:

- Access Endpoint (access-endpoint)
- Release Board (board)
- CDR Link (cdr-link)
- Data Module (data-module)
- Fiber Link (fiber-link) (unsupported for the D92I)
- Journal Printer (journal-printer)
- Link (link)
- Mis (mis)
- Modem Pool (modem-pool)
- Packet Control (packet-control)
- PMS Link (pms-link)
- Port (port)
- PRI Endpoint (pri-endpoint)
- SP Link (sp-link)
- SPE Standby (spe-standby)
- Station (station)
- TDM (tdm)
- Tone Clock (tone-clock)
- Trunk (trunk)

Reset Commands

The reset command is used to reset the following:

- Port Circuit Packs (board)
- Processor Interface Circuit Pack (interface)
- EPN Maintenance Circuit Pack (maintenance)
- Switch Processing Element (spe-standby)
- Switch Processing Element System (system)

Reset Error Codes

Table 10-2 indicates the common error codes that can be returned from any reset command when a failure or an abort is returned.

Table 10-2. Reset Command Error Codes

Error Code	Command Result	Description/ Recommendation
	ABORT	System resources are unavailable. 1. Retry the command at one-minute intervals a maximum of five times.
1005	ABORT	Applies only to DS1 interface circuit packs. The DS1 interface circuit pack to be reset is currently supplying the on-line synchronization reference. 1. To reset this circuit pack, the **set sync** command must be used to designate a new DS1 interface circuit pack as the on-line reference.
1015	ABORT	All objects on the circuit pack are not in the out-of-service state. 1. Use the **busyout board** command to place all objects on the circuit pack in the out-of-service state. 2. Then repeat the **reset** command.
1030	ABORT	This test, which is being requested on a circuit pack that is a part of the Standby SPE, is not allowed.
1	FAIL	Circuit pack was not successfully halted. Replace the circuit pack.
2	FAIL	Circuit pack was not successfully restarted after being halted. Replace the circuit pack.
	PASS	Circuit pack was successfully reset and is running. 1. The **test board PCSS** command should be run to verify that the circuit pack is functioning properly.

Continued on next page

Table 10-2. Reset Command Error Codes — *Continued*

Error Code	Command Result	Description/ Recommendation
	EXTRA BD	This result can appear for the Maintenance/Test, Call Classifier, Tone Detector, Announcement and Speech Synthesis circuit packs. Each of these circuit packs has restrictions on how many can be in the system or a port network. The restrictions are as follows: a. Maintenance/Test circuit pack — 1 per port network b. Tone Detector circuit pack — up to 10 per system c. Call Classifier circuit pack — up to 10 per system d. Speech Synthesis circuit pack — up to 6 per system e. Announcement circuit pack — 1 per port network Remove this circuit pack.
62524 62525 62526	ABORT	System resources required to begin maintenance activity on this MO are unavailable. Maintenance is currently active on the maximum number of maintenance objects that the system can support. A typical reason for this condition is that the system contains a large number of stations and/or trunks that have been administered but that are not physically connected. However, the circuit packs on which they have been administered are physically present in the system. 1. Resolve as many alarms as possible on the station and trunk MOs or busyout these MOs to stop maintenance activity on them. 2. Rerun the test.

Restore Command

There is only one restore command (announcements).

Resume Command

There is only one resume command (hardware-group).

Save Commands

The save command can save the following:

- Announcements (announcements)
- Translation (announcements)

Set Commands

The set command is used to activate the following items:

- Expansion-Link (exp-link)
- ISDN-PRI Signaling-Group (signaling-group)
- Options (options)
- Synchronization (synchronization)
- TDM-Bus (tdm)
- Time (time)
- Tone-Clock (tone-clock)
- Vector (vector)

Status Commands

The status commands are used to check the operational status of:

- Access Endpoint (access-endpoint)
- Administered Connection (administered-connection)
- Administered Temporary Signaling Connection (tsc-administered)
- Attendant Console (attendant)
- Audits (audits)
- Card Memory (card-mem) [386 systems]
- CDR Link (cdr-link)
- Data Module (data-module)

- Hardware Group (hardware-group)
- Health (health)
- ISDN-BRI Port (bri-port)
- ISDN-PRI Signaling Group (signaling-group)
- ISDN Test Call (isdn-testcall)
- Interface (interface)
- Journal Link (journal-link)
- Link (link)
- Logins (logins)
- MST (mst)
- Packet Control (packet-control)
- Processor Channel (processor-channel)
- Station (station)
- Synchronization (synchronization)
- System (system)
- System Printer Link (sp-link)
- Terminal Translation Initialization (tti)
- Trunk (trunk)

The status commands provide internal software state information for diagnosis. Also, if the specified maintenance object (facility) is busy, the commands can help locate other facilities to which the facility is communicating. Thus, the time spent performing maintenance can be reduced.

Test Command

Command: **testobject location** "qualifiers"

testobject location "qualifiers"

The **test** command is used to invoke specific hardware diagnostic tests on a particular MO.

The **test** command can be used on the following objects:

- Access Endpoint (access-endpoint)
- Alarms (alarms)
- Analog Test Call (analog-testcall)
- Board (board)

- Call Detail Recording Link (cdr-link)
- Customer Alarm (customer-alarm)
- Data Module (data-module)
- Duplication Interface (duplication-interface)
- Environment (environment)
- Hardware Group (hardware-group)
- INADS Link (inads-link)
- Interface (interface)
- ISDN Test Call (isdn-testcall)
- Journal Printer (journal-printer)
- LED (led)
- Link (link)
- Maintenance (maintenance)
- Memory Card (card-mem)
- Modem Pool (modem-pool)
- Network Control (network-control)
- Packet Control (packet-control)
- Packet Bus (pkt)
- Property Management System Line (pms-link)
- Port Circuit (port)
- PRI Endpoint (pri-endpoint)
- Processor Circuit Pack (processor)
- Shadow Link (shadow-link)
- Signaling Group (signaling-group)
- Standby Switching Processing Element (spe-standby)
- Station (station)
- System Printer Link (sp-link)
- Synchronization (synchronization)
- Tape (tape)
- TDM Bus (tdm)
- Temporary Signaling Connection (tsc-administered)
- Trunk Group (trunk)
- Tone Clock Board (tone-clock)

The various segments of the command line are defined as follows:

- **object:** a specific maintenance object (for example, circuit pack, port, trunk).
- **location:** the physical address of the MO under test. Depending on the MO, one or more of the following must be supplied: P for port network number (1 for PPN or 2 or 3 for EPN); C for carrier designation.

  (A, B, C, D, or E); SS for address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.); and pp for the 2-digit port number.
- **qualifiers:**
  - — **sh** for short test sequence
  - — **l** for long test sequence
  - — **r** for repeat number
  - — **sch** for scheduled report
  - — **clear** for "test [to] clear" (See "Test Clear Option" for a description.)

NOTE:
Use of the **clear** option with the **test** command is recommended to retire alarms of the "leaky bucket" type (that is, with error counters that cannot be decremented via system technician-demanded tests). Refer to the "Test Command" description in this chapter.

WARNING:
If a maintenance test has been disabled, it is not run when the test command is issued. Refer to the "Disable Commands" and "Enable Commands" sections in this chapter.

A typical command line entry to test the Maintenance circuit pack (which is identified as MAINT in the Hardware Error and Alarm Logs) is as follows:

test maint sh r 3

This tells the maintenance software to test the MAINT MO by invoking the short sequence of tests and to repeat the test three times.

The test commands cause tests to be run on the MOs. Any tests that are considered destructive (that is, tests that may affect service and/or cause loss or corruption of data) are clearly labeled as such in the MO sections in this chapter. The short tests are those that the maintenance software automatically runs each hour and are not service-affecting. The long tests are basically those tests that the maintenance software automatically runs once every 24 hours and are more destructive than the short tests. When a long test is specified, the short tests are run also.

NOTE:
If you do not specify either the long or short test sequence, the system runs the short test sequence (which is the default).

The tests can be repeated as required by inserting **r** at the end of the command line and entering the number of times that the test is to be run.

NOTE:
The identifier "r" (repeat) must be entered before the number (of times to repeat) in order for the field to be recognized.

Some of the tests can be disabled by administering forms on the administration terminal.

All test results are displayed at the administration terminal or at the INADS Center. Screen 10-3 [G1] and Screen 10-4 are examples of the test results for a port circuit when the clear option is not used.

```
  test port 2B1905 long

                            TEST RESULTS

 Port     Maintenance Name   Test No.   Result   Error Code
 2B1905    DIG-LINE           9          ABORT    62524
 2B1905    DIG-LINE           11         PASS
 2B1905    DIG-LINE           13         PASS
 2B1905    DIG-LINE           16         PASS
 2B1905    DIG-LINE           17         PASS
```

Screen 10-3. Demand Test Results [G1]

```
  test port 2B1905 long

                              TEST RESULTS

 Port     Maintenance Name   Alt. Name  Test No.   Result   Error Code
 2B1905    DIG-LINE          1010        9         PASS
 2B1905    DIG-LINE          1010        11        PASS
 2B1905    DIG-LINE          1010        13        PASS
 2B1905    DIG-LINE          1010        16        PASS
 2B1905    DIG-LINE          1010        17        PASS
```

Screen 10-4. Demand Test Results

The following information is contained in the test results:

- **Port:** Maintenance object's physical location—port network number (1 for PPN or 2 or 3 for EPN), carrier, slot number, port number. If the port network number is not entered in the command, then the system assumes a 1 for the PPN.

  NOTE:
  This information does not apply to fixed-position circuit packs.

- **Maintenance Name:** Maintenance object's logical name.
- **Alt. name:** The alternate means of identifying the maintenance object. This field contains the extension when the object is a station or data module, and it contains xx/yy when the object is a trunk, where xx is the trunk group number and yy is the member number. It contains P/xx when the object is a Private Co line, where xx is the Private Co line group number.
- **Test No.:** A system identifying number for the individual tests. Descriptions of the tests according to "Test No." are provided for each MO.
- **Result:** The results of the individual test—"PASS," "FAIL," "ABORT," "NO BOARD," "EXTRA BD," "DISABLED".

  Abort codes 62524, 62525, and 62526 also can occur for all test commands. For details, see the "Busyout/Release Error Codes" in this chapter.

  NOTE:
  All tests for a port on an intelligent port circuit pack abort if that port is busy.

- **Error Code:** A system-generated number that tells why the individual test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

Test Command Error Codes

Table 10-3 indicates the common error codes that can be returned from any test command when a failure or an abort is returned.

Table 10-3. Test Command Error Codes

Error Code	Test Result	Description/ Recommendation
0	ABORT	Internal system error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If command still aborts, then escalate the problem.
2012 2500	ABORT	Internal system error.
2100	ABORT	System resources unavailable. 1. Retry the command at one-minute intervals a maximum of five times. 2. If command still aborts, then escalate the problem.
62524 62525 62526	ABORT	System resources required to begin maintenance activity on this MO are unavailable. Maintenance is currently active on the maximum number of maintenance objects that the system can support. A typical reason for this condition is that the system contains a large number of stations and/or trunks that have been administered but that are not physically connected. However, the circuit packs on which they have been administered are physically present in the system. 1. Resolve as many alarms as possible on the station and trunk MOs or busyout these MOs to stop maintenance activity on them. 2. Rerun the test.
	NO BOARD	Circuit pack has been removed. Cannot test object.
	EXTRA BD	Certain circuit packs have limitations on how many circuit packs can be in the system or port network such as the Maintenance Test Circuit Pack (TN771B or TN771C), the Tone Detector Circuit Pack (TN748B, TN748C or TN748D) and the Call Classifier (TN744). The Maintenance Test Circuit Pack allows only one circuit pack per port network. The Tone Detector and the Call Classifier allow only 10 circuit packs in each system. All additional circuit packs return EXTRA-BD and should be removed.

Test LED Command

NOTE:
Since most **test** commands exercise a specific MO or group of related MOs, their appropriate use is outlined in the various MO sections. However, since the **test led** command does not fall under any one MO described in Chapter 11, "Maintenance Object Repair Procedures", it is described as follows:

The **test led** command enables the technician to check LEDs on a specific network or on the entire system.

Upgrade Software Command

This command (upgrade software) causes the Standby processing element to boot with the new software from tape, load in translations, initiate an interchange of the processing elements, and enter the active mode via a Cold 2 restart (reset system 2).

busyout access-endpoint

This command will busyout a specified access endpoint.

SYNOPSIS

busyout access-endpoint extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

busyout access-endpoint 25012
busyout access-endpoint 77868

DESCRIPTION

The busyout access-endpoint command will put all the ports associated with the specified access endpoint in a maintenance busy (system technician busy) state. There will be no periodic or scheduled tests performed on the busied out access endpoint ports until they are released. When the access endpoint ports are maintenance busy (system technician busy) then the access endpoint is removed from active service on the switch (i.e., no call processing activity may include the busied objects). Warning alarms are generated on each busied out port in the access endpoint. The release access-endpoint command will return all the ports associated with the specified access endpoint to operation.

Defaults

No defaults.

Parameters

Extension	An extension number associated with the desired access endpoint. The number of digits in an extension is determined by the dial-plan.

Help Messages

If the user presses HELP after entering "busyout access-endpoint," the following message is displayed:

```
Enter assigned extension
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the access endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not an access endpoint, the following message will be displayed:

```
Extension assigned to object other than access-endpoint
```

If the board that contains the access endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Maintenance Name	The type of maintenance object that is being busied out. For wideband access endpoint the maintenance name for each port is "WAE-PORT." For single port access endpoint the maintenance name is 'TIE-DS1."
Alt. Name	The alternate way of identifying the maintenance object. This field contains the extension number of the access endpoint.
Result	An indicator as to whether the object is successfully busied out. The possible values are: PASS, FAIL and ABORT.
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, the command "busyout access-endpoint 22502" was entered. Assume that the access endpoint ports for extension 22502 are in cabinet 1, carrier C, slot 11, circuit 1 to 6.

```
busyout access-endpoint 22502                       SPE A

                           COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C1101   WAE-PORT        22502       PASS
  01C1102   WAE-PORT        22502       PASS
  01C1103   WAE-PORT        22502       PASS
  01C1104   WAE-PORT        22502       PASS
  01C1105   WAE-PORT        22502       PASS
  01C1106   WAE-PORT        22502       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

If there is an active call on the specified access endpoint, the busyout command will cause the call to drop. This command is destructive.

busyout board

This command will busyout each maintenance object on the specified board.

SYNOPSIS

busyout board location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout board 01c11
busyout board 02c15

DESCRIPTION

The busyout board command will put every administered maintenance object on the circuit pack at the specified location in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out objects until they are released. The ports on the board may not be used for call processing (i.e., terminals on the administered ports will not receive dial-tone, etc.). Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release board command will return every administered maintenance object on the circuit pack at the specified location to operation.

WARNING:
This command is service disrupting and may cause extraneous alarms.

Defaults

No defaults.

Parameters

location	A "location" represents the physical position of the board to be busied out and is entered as "UUcSS" where "UU" represents the cabinet number (1-3), "c" represents the carrier, and "SS" represents the slot position. A "location" represents the physical position of the port to be marked and is entered as "PCSSpp" where P is the port network number (1 for PPN, 2 for EPN, and 3 for the second EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.), and "pp" represents the circuit (port). A single digit cabinet (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "busyout board," the following message will be displayed:

```
Enter 5 character board number
```

Error Messages

If the format of the board location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the board resides is not available, the following message will be displayed:

```
EPN is not available
```

If a board is not inserted in the specified location, the following message will be displayed:

```
Board not assigned
```

If the specified board does not have any maintenance objects associated with it, the following message will be displayed:

```
No MO in this board
```

If the specified board is part of the DCS link, the board cannot be busied out unless the link itself is busied out first. If the DCS link is not busied out, the following message will be displayed:

```
Must first busyout SCI link
```

If the specified board is an EI board and it is part of the active link, the following message will be displayed:

```
Illegal Command for active object; use 'set' to switch to standby
```

If a busyout is attempted on an invalid board in the service slot, the following message is displayed:

```
Board invalid
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	An indicator as to whether the object was successfully busied out. The result of the busyout -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this Chapter.

For the following output example, assume that the board in cabinet 1, carrier c, slot 7 is an analog board with three ports administered. The command that was entered is "busyout board 1c07."

```
busyout board 01C07                            SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C07     ANL-BD                      PASS
  01C0702   ANL-LINE                    PASS
  01C0701   ANL-LINE         51001      PASS
  01C0703   ANL-LINE                    PASS


Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout cdr-link

This command will busyout a maintenance object associated with the specified call detail recording (cdr)-link.

SYNOPSIS

busyout cdr-link link-id

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

busyout cdr-link primary
busyout cdr-link secondary

DESCRIPTION

The busyout cdr-link command will put the maintenance object associated with a specified call detail recording (cdr)-link in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out maintenance object until it is released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied out object) and the link will be dropped. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release cdr-link command will return the object to operation.

A link is made up of several components. It involves a far end data module, a simulated data channel on a PKTINT board, a manager that initiates and maintains the link, and a controller/protocol that services the link. A controller/protocol is usually a transient process that exists for as long as the link is up. A link is considered up if a physical connection is established. A link can be considered to be up while no useful work can be performed over it, in this case the link is insane and should be torn down. These links provide asynchronous data connections from the switch to peripherals.

For information on what a CDR link is and does, see the second paragraph in the DESCRIPTION section of the "status cdr-link" manual pages.

Defaults

Primary.

Parameters

link-id	The link identifier is either "primary" or "secondary."

Help Messages

If the system technician presses HELP after entering "busyout cdr-link," the following message will be displayed:

```
primary     secondary
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out. With this maintenance object a port address of 1 represents the primary link, while a 2 port address is associated with the secondary link.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	An indicator as to whether the object was successfully busied out.
Error Code	A numerical description of why the command failed.

For the following output example, assume that the command that was entered is "busyout cdr-link primary."

```
busyout cdr-link primary                                   SPE A
                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  1        CDR-LNK                      PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout data-module

This command will busyout a system technician specified data module or data channel.

SYNOPSIS

busyout data-module extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms.

EXAMPLES

busyout data-module 31300

DESCRIPTION

The busyout data module command will put the specified data module in a maintenance busy state, even those data modules that are not installed. There will be no periodic or scheduled tests performed on the busied out data module or data channel until it is released. Also no call processing may be executed on the data modules or over the data channels. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release data module command will return the specified data module (or data channel) to operation.

On a system with the duplication option, a busyout of a Network Control Data Channel, DATA-CHL, or a Processor Interface Port Data Channels, PI-PT, will be preserved across SPE interchanges. The data channel extension must be released before the data channel can be brought back into service.

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired data module or data channel. The number of digits in an extension is determined by a dial-plan.

Help Messages

If the system technician presses HELP after entering "busyout data-module," the following message will be displayed:

```
Enter assigned extension
```

Error Messages

If the length or format of the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the specified extension is not administered, then the following message will be displayed:

```
Extension not assigned
```

If the specified extension is not a data module or a data channel, then the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the EPN that contains the data module port is not available, the following message will be displayed:

```
EPN is not available
```

If the board containing the data module port is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out, or the number of the data channel.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	An indicator as to whether the object was successfully busied out.
Error Code	A numerical description of why the command failed.

For the following output example, assume that the command that was entered is "busyout data-module 300."

```
busyout data-module 300                          SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C1103   DIG-LINE         300         PASS

Command successfully completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

In System 75 R1 a data module that resides on a board that is part of the DCS link cannot be busied unless the link is busied out first.

FEATURE INTERACTIONS

None.

busyout journal-printer

This command will busyout a maintenance object associated with the system technician specified pms-log or wakeup-log.

SYNOPSIS

busyout journal-printer [pms-log | wakeup-log]

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

busyout journal-printer pms-log
busyout journal-printer wakeup-log

DESCRIPTION

The busyout journal-printer command will put the maintenance object associated with a specified pms-log or wakeup-log link in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out maintenance object until it is released. Also, no activity will occur over the links (i.e. no data will be transferred to the printer) and the link will be dropped. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release journal-printer command will return the object to operation.

A link is comprised of several components. It involves a far end data module, a simulated data channel on a PKTINT board, a manager that initiates and maintains the link, and a controller/protocol that services the link. A controller/protocol is usually a transient process that exists for as long as the link is up. A link is considered up if a physical connection is established. A link can be considered to be up while no useful work can be performed over it, in this case the link is insane and should be torn down. These links provide asynchronous data connections from the switch to peripherals.

For general information on journal printer links, see the second paragraph in the DESCRIPTION section of the "busyout pms-link" manual pages.

For information on what a journal printer is and does, see the second paragraph in the DESCRIPTION section of the "status journal-link" manual pages.

Defaults

None.

Parameters

pms-log	This will busyout the link to the pms printer. In the output the port name for the pms link is 1.
wakeup-log	This will busyout the link to the wakeup logging facility. In the output the port name for this object is 0.

Help Messages

If the system technician presses HELP after entering "busyout journal-printer," the following object command word choices will be displayed:

```
pms-log          wakeup-log
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

Error Message

```
Link not administered not enabled
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out. In this case, the physical object port address will be a 0 for wakeup log and a 1 for the pms log.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	Not applicable.
Result	An indicator as to whether the object was successfully busied out.
Error Code	A numerical description of why the command failed.

For the following output example, assume that the command that was entered is "busyout journal-printer wakeup-log."

```
busyout journal-printer wakeup-log                      SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  0       JRNL-LINK                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recover of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will not cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

busyout link

This command will busyout the system technician specified link.

SYNOPSIS

busyout link link-id

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout link 1

DESCRIPTION

The busyout link command will put the maintenance objects associated with a specified link in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out maintenance objects until they are released. Also the link will be marked out of service and inaccessible to call processing for use. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release link command will return the objects to operation.

Defaults

None.

Parameters

link-id	The link-id is a number associated with each link between 1-8. Link 1 through 4 reside on Processor Interface circuit pack "1a1" or "1b1" and 5 through 8 reside on Processor Interface circuit pack "1a2" or "1b2."

Help Messages

If the system technician presses HELP after entering "busyout link," the following message will be displayed:

```
Enter 1 character link number
```

Error Messages

If the link identifier is not valid, the following error message is displayed:

```
Link out of range, please press HELP
```

If the link is not administered, the following error message is displayed:

```
Link not administered or not enabled
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out. With this command the Port address represents the link-id.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	Not applicable.
Result	"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the command that was entered is "busyout link 1."

```
busyout link 1                                 SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C0301   PI-LINK                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout mis

This will busyout a specified management information system.

SYNOPSIS

busyout mis

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, cust, rcust.

EXAMPLES

busyout mis

DESCRIPTION

The busyout mis command will put a management information system in the maintenance busy state. There will be no periodic or scheduled maintenance performed on the busied out mis until it is released. When the object is busied out no call processing activity may be performed over the link. A warning alarm is generated (error type 18) on the mis that has been busied out, so that INADS can access the state of it. The release mis command will return the busied out mis to operation.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "busyout mis" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	Not applicable
Maintenance Name	The type of maintenance object that is being busied out. For this command the field is always MIS.
Alt. Name	Not applicable
Result	An indicator as to whether the object was successfully busied out. PASS or ABORT will typically be here.
Error Code	A numerical description of why the command failed or was aborted. 1010 - already busied out

For the following output example, assume that the command that was entered is "busyout mis."

```
busyout mis                                SPE A

                         COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
          MIS                           PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

busyout modem-pool

This command will allow all members of a modem pool group to be busied out.

SYNOPSIS

busyout modem-pool group/*member*

PERMISSIONS

The following default logins may execute this command: init, inads, system technician.

EXAMPLES

busyout modem-pool 1
busyout modem-pool 4/3

DESCRIPTION

The "busyout modem-pool" command will put the specified modem pool group or group member in the maintenance busy state, even those groups that are not installed. There will be no periodic or scheduled tests performed on the busied out modem pool groups or group members until they are released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). A single group member can be busied out by specifying the group number, a "/," and the member number. All members in a modem pool group can be busied out by specifying the modem pool group number only. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The "release modem-pool" command will return the specified modem pool group or group member to operation.

Defaults

None.

Parameters

group number	The group number is assigned from administration. The group number may be any administered group from 1-5.
member number	The member number is assigned from administration. A member is a pair of analog and digital line ports (or two pair for the Integrated modem-pool case). The member number may be any administered group member from 1-32.

Help Messages

If the system technician presses HELP after entering "busyout modem-pool" the following message will be displayed:

```
Enter assigned group number between 1-5
 Or press CANCEL to cancel the command
```

Error Messages

If the "busyout modem-pool" command is entered from a login for which the command is not valid, then the following message will be displayed:

```
"busyout" is an invalid entry; please press HELP
```

If the group or member numbers entered are not in a valid format, the following message will be displayed:

```
Identifier invalid
```

If the group number entered is not within the range of groups or the member number is not within the member range, then the following message will be displayed:

```
Boards not assigned
```

If the specific group or member are not administered, then the following message will be displayed:

```
Group not assigned, or group assigned but with no member
```

If a software fault is encountered while the command is executing, the following message will be displayed:

```
Error encountered, can’t complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

When each modem pool member has been busied out, the following information will be displayed:

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object which is being busied out.
Maintenance Name	The type of maintenance object that is being busied out. This is always MODEM-PT.
Alt. Name	This field is not applicable to this command.
Result	The result of the busyout -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

In the following output example, the command "busyout modem-pool 1" was entered.

```
busyout modem-pool 1                            SPE B

                         COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code

  01C0701   MODEM-PT                     PASS
  01C0703   MODEM-PT                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout packet-control

This command will busyout the specified packet-control.

SYNOPSIS

busyout packet-control *location*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init

EXAMPLES

busyout packet-control 1A
busyout packet-control 1B

DESCRIPTION

The busyout packet-control command will put the packet-control circuit pack in a maintenance busy state, and tear-down each point-to-point signaling link that is terminated on this packet-control. There will be no periodic or scheduled test performed on the busied out packet-control until it is released. A warning alarm is generated (error type 18) on the busied out packet-control so that INADS can access the state of the object. The release packet-control command will return the board to a normal operation state and initiate recovery on all point-to-point signaling links terminated on this packet-control.

Defaults

For simplex systems, the location is optional and defaults to cabinet 1, carrier A. For duplex systems, the cabinet default is again cabinet 1, but there is no default for the carrier.

Parameters

location	The location only applies to duplicated configurations. If the configuration is a simplex, the location parameter is not used and thus is not valid. For duplicated configurations, a "location" represents the carrier that the packet-control resides on in the system. Valid locations are either 1A or 1B.

Help Messages

If the system technician presses HELP after entering "busyout packet-control," the following message is displayed:

```
Enter Packet Control location: [cabinet(1)];carrier(A-B)
```

Error Messages

If this command is entered for a packet-control that resides on the stand-by control complex of a duplicated system, the following message is displayed:

```
Command only applies to the active Packet Control
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	This field represents the Cabinet-Carrier in which the Packet-Control resides.
Maintenance Name	The type of maintenance object that is being busied out (which in this case is always PKT-CTRL).
Alt. Name	This field is not used in this output display.
Result	An indicator as to whether the object was successfully busied out ("PASS," "ABORT," or "FAIL").
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes is present in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, the command busyout packet-control 1A was entered.

```
busyout packet-control 1A                          SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code

  1A       PKT-CTRL                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

In a duplicated system, an attempt to busyout the packet-control that resides in the standby processor complex will be disallowed.

When the packet-control in the active control complex is busied out, all connectivity across the Packet Bus will be severed. Thus, all ISDN-BRI point-to-point signaling links that have been established via the active packet-control will be torn down by the busyout packet-control command. The release packet-control command will reestablish all Packet Bus connectivity.

busyout pms-link

This command will busyout a specified property management system link.

SYNOPSIS

busyout pms-link

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout pms-link

DESCRIPTION

The busyout pms-link command will put all maintenance objects associated with a property management system link in the maintenance busy state. There will be no periodic or scheduled maintenance performed on the busied out maintenance objects until they are released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object) and the link will be dropped. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release pms link command will return the busied out objects on the link to operation.

A link is made up of several components. It involves a far end data module, a simulated data channel on a NETCON board, a manager that initiates and maintains the link, and a controller/protocol that services the link. A controller/protocol is usually a transient process that exists for as long as the link is up. A link is considered up if a physical connection is established. A link can be considered to be up while no useful work can be performed over it, in this case the link is insane and should be torn down. These links provide asynchronous data connections from the switch to peripherals.

For information on what a PMS is and does, see the second paragraph in the DESCRIPTION section of the "status pms-link" manual pages.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "busyout pms-link" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	With this maintenance object the port field is left blank.
Maintenance Name	The type of maintenance object that is being busied out (always PMS-LINK).
Alt. Name	Not applicable.
Result	The result of the busyout -"PASS", "ABORT", "FAIL".
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the command that was entered is "busyout pms-link."

```
busyout pms-link                                       SPE A

                                COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
            PMS-LINK                     PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recover of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will not cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

busyout port

This command will busyout a specified port on a circuit pack.

SYNOPSIS

busyout port location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout port 01c1101
busyout port 02c1501

DESCRIPTION

The busyout port command will put the specified port on a circuit pack in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out port until it is released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release port command will return the administered port on a circuit pack at a specified location to operation.

Defaults

No defaults.

Parameters

location

A "location" represents the physical position of the port to be busied out and is entered as "UUcSSpp" where "UU" represents the cabinet number (1-3), "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit (port).

A "location" represents the physical position of the port to be marked and is entered as "PCSSpp" where P is the port network number (1 for PPN, 2 for EPN, and 3 for the second EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.), and "pp" represents the circuit (port). A single digit cabinet (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "busyout port," the following message will be displayed:

```
Enter 7 character port number
```

Error Messages

If the format of the port location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the port resides is unavailable, the following message will be displayed:

```
EPN is not available
```

If the board on which the port resides is not administered, the following error message will be displayed:

```
Port not assigned
```

If the board on which the port resides is part of the SCI link, the following error message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the port is translated within a Wideband Access Endpoint, the following error message will be displayed:

```
Port within wideband access endpt; Use busyout access-endpoint <ext> instead
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Maintenance Name	The type of maintenance object that is being busied out.
Result	The result of the busyout -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the port in cabinet 1, carrier c, slot 7, circuit 1 is an analog port. The command that was entered is "busyout port 1c0701."

```
busyout port 01C0701                                   SPE A

                          COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C0701   ANL-LINE                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout pri-endpoint

This command will busyout a specified PRI endpoint.

SYNOPSIS

busyout pri-endpoint extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

busyout pri-endpoint 25012
busyout pri-endpoint 77868

DESCRIPTION

The busyout pri-endpoint command will put all PRI endpoint ports (B-channels) associated with the specified PRI endpoint in a maintenance busy (system technician busy) state. There will be no periodic or scheduled tests performed on the busied out PRI endpoint ports until they are released. When the PRI endpoint port is maintenance busy (system technician busy) then the port is removed from active service on the switch (i.e., no call processing activity may include the busied object). Warning alarms are generated on each busied out port. The release pri-endpoint command will return all ports (B-channels) associated with the specified PRI endpoint extension to operation. When released, the switch will attempt to negotiate with the far-end PRI terminal adapter to put each PRI endpoint port (B-channel) into in-service state.

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired PRI endpoint. The number of digits in an extension is determined by the dial-plan.

Help Messages

If the user presses HELP after entering "busyout pri-endpoint," the following message is displayed:

```
Enter assigned extension
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the PRI endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a PRI endpoint, the following message will be displayed:

```
Extension assigned to object other than pri-endpoint
```

If the board that contains the PRI endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Maintenance Name	The type of maintenance object that is being busied out. The name for PRI endpoint port is "PE-BCHL."
Alt. Name	The alternate way of identifying the maintenance object. This field contains the extension number of the PRI endpoint.
Result	An indicator as to whether the object is successfully busied out. The possible values are: PASS, FAIL or ABORT.
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, the command "busyout pri-endpoint 22501" was entered. Assume that the PRI endpoint ports for extension 22501 are in cabinet 1, carrier B, slot 20, circuit 1 to 6.

```
busyout pri-endpoint 22501                          SPE A

                            COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01B2001   PE-BCHL          22501       PASS
  01B2002   PE-BCHL          22501       PASS
  01B2003   PE-BCHL          22501       PASS
  01B2004   PE-BCHL          22501       PASS
  01B2005   PE-BCHL          22501       PASS
  01B2006   PE-BCHL          22501       PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

If there is an active call on the specified PRI endpoint, the busyout command will cause the call to drop. This command is destructive.

Once the PRI endpoint is in the maintenance busy (system technician busy) state, all call attempts from the far-end PRI terminal adapter will be denied with a cause value 17 (User Busy).

busyout sp-link

This command will busyout the system printer link.

SYNOPSIS

busyout sp-link

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout sp-link

DESCRIPTION

The busyout sp-link command will put the system printer link into a maintenance busy state. There will be no periodic or scheduled maintenance performed on the busied out system printer link until it is released. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the object. Placing the system printer link in a busyout state will prevent access to the system printer. The release sp-link command will return the system printer link to operation.

The system printer link is a link from the switch to an external printer over which jobs can be printed. This link is created by administering the system printer extension and setting up a call to the system printer.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "busyout sp-link," the following is displayed:

```
Entry is not required
```

Error Messages

If the system printer link is not administered, the following message is displayed:

```
Link not administered or not enabled
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	Not applicable. Will always be blank.
Maintenance Name	The type of maintenance object that is being busied out will always be SYS-PRNT.
Alt. Name	Not applicable. Will always be blank.
Result	The result of the busyout - "PASS," "ABORT," "FAIL".
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Error Codes" section of this chapter.

For the following output example the command entered was "busyout sp-link."

```
busyout sp-link                                  SPE A

                              COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
          SYS-PRNT                       PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

busyout spe-standby

This command allows the technician to busyout the standby Switch Processing Element (SPE)

SYNOPSIS

busyout spe-standby

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout spe-standby

DESCRIPTION

The busyout spe-standby command raises the Fault Severity Level of the Standby SPE (see reference 5) of the standby Switch Processing Element (SPE) by raising a Warning Off-board alarm against STBY-SPE. Because a Warning Off-board STBY-SPE alarm is defined to have the highest Fault Severity of all alarms the affect the health of an SPE (refer to the Reset System MUS), the chance that an SPE interchange will occur is diminished, but does not guarantee that an SPE interchange will not occur. Once the standby SPE is busied out, an SPE interchange will only occur if the standby SPE is hard selected via the SPE Select switches or the active SPE goes into SPE down mode. This command will also stop any activity currently executing on the standby SPE and will disable memory shadowing to the standby SPE. Periodic and scheduled testing **will** be prevented from starting on the standby SPE while it is busied out. The busyout state of the standby SPE and the STBY-SPE Warning alarm will be maintained across a reset system 1 (Warm restart) and a reset system 2 (Cold 2 restart) but will be removed after all other levels of restart.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "busyout spe-standby" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If this command is issued while an **upgrade software** command is active the following message will be displayed:

```
Standby SPE upgrade in progress, command denied
```

OUTPUT

Port	The port address will display the cabinet and carrier location of the standby SPE. The standby SPE port address will always be 01A or 01B.
Maintenance Name	"STBY-SPE" for the standby SPE maintenance object.
Alt. Name	Always blank for this command.
Result	The result of the busyout -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the standby SPE is located in carrier "B." The command that was entered is "busyout spe-standby."

```
busyout spe-standby                                         SPE A

                                  COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result        Error Code
  01B     STBY-SPE                       PASS

Command successfully completed
```

FEATURE INTERACTIONS

When a busyout of the standby SPE is performed, the fault severity level of the standby SPE is set to the highest possible value and memory shadowing is turned off. This is done to lessen the probability that the system will switch to the standby SPE. However, in some cases a "spontaneous" (hard) interchange of the SPEs may still occur.

This command can be used as a mechanism to turn off memory shadowing of the standby SPE.

If the standby SPE is in poor health (less than optimum), memory shadowing can not be disabled, or communication to the standby is impossible a busyout of the standby SPE will still be successful.

busyout station

This command will busyout a specified station.

SYNOPSIS

busyout station extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout station 10020
busyout station 32770

DESCRIPTION

The busyout station command will put the specified administered voice terminal extension (station) in a maintenance busy state, even those stations that are not installed. There will be no periodic or scheduled tests performed on the busied out station until it is released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release station command will return the specified voice terminal extension to operation.

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired voice terminal. The number of digits in an extension is determined by a dial-plan.

Help Messages

If the system technician presses HELP after entering "busyout station," the following message will be displayed:

```
Enter extension for an assigned station
```

Error Messages

If the format of the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the specified extension is not administered, then the following message will be displayed:

```
Extension not assigned
```

If the specified extension does not belong to a station or attendant console, the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the station port resides on an EPN that is unavailable, the following message will be displayed:

```
EPN is not available
```

If the station port resides on a board that is not inserted in the system, the following message will be displayed:

```
Board not assigned
```

If the station port resides on a board that is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension.
Result	The results of trying to busyout the station - "PASS," "FAIL," "ABORT."
Error Code	A numerical description of why the command aborted or failed.

For the following output example, assume that the command that was entered is "busyout station 1002."

```
busyout station 1002                                     SPE A

                           COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C1102   DIG-LINE                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout tdm

This command will busyout a TDM bus on the PPN or any EPN. The TDM bus with system tones can not be busied out.

SYNOPSIS

busyout tdm pn number bus

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout tdm 1a

DESCRIPTION

The busyout tdm command will put the specified tdm bus in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out bus until it is released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). Warning alarms are generated (error type 18) on each tdm bus busied out, so that INADS can access the state of the objects. The release tdm command will return the specified tdm bus to operation.

Defaults

No defaults.

Parameters

pn number	The PN number specifies the Port Network number of the TDM bus to be busied out.
bus	The TDM bus ("a" or "b") specifies which half of the TDM bus is desired. Each 512 time slot TDM bus is configured as two duplicate 256 time slot buses. This division allows for duplication of control channels and dedicated tone time slots. The default control bus (carrying the control channel) is the "a" bus, while the default tone bus (carrying dedicated tones) is the "b" bus. A port-network number (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "busyout tdm," the following message will be displayed:

```
Enter TDM bus location: [network(1-3)];carrier(A-B)
```

Error Messages

If the technician does not enter a port network number followed by bus, the following message will be displayed:

```
Identifier invalid
```

If the port network on which the desired TDM bus resides is unavailable, the following message will be displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address is displayed as PN followed by the port network number and bus (A or B) associated with the TDM bus.
Alt. Name	Not applicable.
Maintenance Name	The type of maintenance object that is being busied out. In this case it is always TDM-BUS.
Result	The result of the busyout -"PASS," "ABORT," "FAIL".
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the command that was entered is "busyout tdm port-network 1 bus a."

```
busyout tdm port-network 1 bus a                       SPE A

                          COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  PN 01A  TDM-BUS                        PASS

Command successfully completed
```

FEATURE INTERACTIONS

If a bus is busied out, no calls will be torn down. However, no new calls will be set up on the busied out bus.

Dedicated tone time slots must be moved to another bus (the other half of the duplicated bus) before a busyout of a particular bus will be allowed.

busyout tone-clock

This command will busyout a tone/clock circuit pack.

SYNOPSIS

busyout tone-clock location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout tone-clock 01c
busyout tone-clock 03d

DESCRIPTION

The busyout tone-clock command will put the specified tone/clock in a maintenance busy state. There will be no periodic or scheduled tests performed on the busied out object until it is released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). Warning alarms are generated (error type 18) on each tone clock circuit pack busied out, so that INADS can access the state of the objects. The release tone-clock command will return the specified tone/clock to operation.

Defaults

The cabinet number will default to 1 (one).

Parameters

location	A "location" represents the physical position of the tone/clock to be busied out and is entered as "UUc" where "UU" represents the cabinet number, and "c" represents the carrier. A cabinet number (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "busyout tone-clock," the following message will be displayed:

```
Enter tone/clock location: [cabinet(1-3];(carrier(A-E))
```

Error Messages

If an identifier greater than 3 (three) characters is entered, or the cabinet entered is not a digit (number), the following message will be displayed:

```
Identifier invalid
```

If the carrier entered is invalid, the following message will be displayed:

```
Invalid carrier specified
```

If the cabinet entered is not within the valid range of cabinets or the cabinet is not administered, the following message will be displayed:

```
Cabinet number not assigned
```

If there is no tone/clock board at the specified location, one of the following messages will be displayed:

```
Board not inserted
Board not assigned
```

If the specified cabinet carrier location is that of a switch node, the following message will be displayed:

```
Switch Node carrier specified; invalid command for SN carrier
```

If the cabinet carrier location entered is that of an EPN that is not available, the following message will be displayed:

```
EPN is not available
```

If the tone/clock is active and the specified action is busyout, the following message will be displayed:

```
Illegal Command for active object; use ’set’ to switch to standby
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The tone clock maintenance object will only display the cabinet and carrier of the desired tone/clock board.
Maintenance Name	The type of tone clock circuit pack that is being busied out which is TONE-PT, TDM-CLK and TONE-BD.
Alt. name	Not applicable.
Result	The result of the busyout -"PASS," "ABORT," "FAIL".
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the command that was entered is "busyout tone-clock 1a."

```
busyout tone-clock 1a                               SPE A

                           COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01A     TONE-PT                       PASS
  01A     TDM-CLK                       PASS
  01A     TONE-BD                       PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

busyout trunk

This command will busyout a specified trunk group or trunk group member.

SYNOPSIS

busyout trunk group*/member*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

busyout trunk 78
busyout trunk 78/1

DESCRIPTION

The busyout trunk command will put the specified trunk group or trunk group member in a maintenance busy state, even trunk groups that are not installed. There will be no periodic or scheduled tests performed on the busied out trunk groups or trunk group members until they are released. When the object is maintenance busy then the object is removed from active service on the switch (i.e., no call processing activity may include the busied object). A single group member can be busied out by specifying the group number, a "/," and the member number. All members in a trunk group can be busied out by specifying the trunk group number only. Warning alarms are generated (error type 18) on each maintenance object busied out, so that INADS can access the state of the objects. The release trunk command will return the specified trunk group or group member to operation.

NOTE:
While not recommended, if the user enters "busyout trunk <group number>/," the lowest port-location in the group will be busied out.

Defaults

No defaults.

Parameters

group	The group number is an administered number associated with each trunk group. The valid range is 1 - 99.
member	The member number is an administered number identifying a particular trunk within a trunk group. The valid range is 1 - 99.

Help Messages

If the system technician presses HELP after entering "busyout trunk," the following message will be displayed:

```
Enter assigned trunk group number [or group/member]
```

Error Messages

If the format of the identifier is invalid, the following message will be displayed:

```
Format invalid
```

If the range of the trunk group is incorrect, the following error message will be displayed:

```
Trunk or trunk group invalid
```

If the specified trunk group is not administered or has no members, the following message will be displayed:

```
Group not assigned, or group assigned but with no member
```

If the specified member is not administered, the following message will be displayed:

```
Group member not assigned
```

If the specified trunk group is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	The result of the busyout - "PASS", "ABORT", "FAIL".
Error Code	A system-generated number that tells why the busyout failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Error Codes" section of this chapter.

For the following output example, assume that the command that was entered is "busyout trunk 78/1."

```
busyout trunk 78/1                                SPE A

                          COMMAND RESULTS

  Port    Maintenance Name  Alt. Name   Result       Error Code
  01C1505   CO-TRK           78/01       PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

cancel hardware-group

This command allows a user to cancel an active "test hardware-group" command executing in the background or foreground mode.

SYNOPSIS

cancel hardware-group

PERMISSIONS

The following logins may execute this command: inads, init.

EXAMPLES

cancel hardware-group

DESCRIPTION

A system technician, in the course of the execution of a "test hardware-group" command may find the need to halt the testing either temporarily or permanently. This can be accomplished by entering the "cancel hardware-group" command on the SAT. The canceled "test hardware-group" command may be restarted where it left off with the "resume hardware-group" command or another "test hardware-group" may be entered.

In addition to the "cancel hardware-group" command, the 'cancel' key on the SAT may be pressed to cancel a hardware-group command executing in the foreground.

The status of a canceled "test hardware-group" command will show up as 'canceled' on the "status hardware-group" screen.

When a "test hardware-group" command is executing in the foreground with the 'continuously' option and the 'cancel' key on the SAT is pressed or the "cancel hardware-group" command is entered, then the hardware-group command is canceled and for security reasons, the SAT running the "test hardware-group" command will be logged off. However, after logging back on the system, the user still maintains the capability to restart the canceled "test hardware-group" command with the "resume hardware-group" command.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses help after entering "cancel hardware-group" the following message will be displayed:

```
Entry is not required
```

Error Messages

If there is no "test hardware-group" command currently active to be canceled, the following message will be displayed:

```
Command aborted - no hardware-group test in progress
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

If a "test hardware-group" command executing in the background is successfully canceled with the "cancel hardware-group" command, the following response will be displayed:

```
Hardware-group command successfully canceled
```

If a "test hardware-group" command executing in the foreground is successfully canceled with a "cancel hardware-group" command from another SAT terminal, the following response will be displayed on the SAT terminal where the hardware-group command was executing:

```
Hardware-group command aborted with cancel command entered from another SAT
```

FEATURE INTERACTIONS

Scheduled and Periodic Maintenance

When a "test hardware-group" is entered, all activity related to scheduled background maintenance, periodic background maintenance, and data audits is suspended for the duration of the execution of the "test hardware-group" command. All activity related to scheduled background maintenance, periodic background maintenance, and data audits will restart if the "test hardware-group" command is canceled.

Status Hardware-group

The state of a canceled "test hardware-group" command can be displayed by means of the "status hardware-group" command and the state will show up as 'canceled'.

change circuit-packs

This command allows the user to add, change, or remove circuit packs which are administered.

SYNOPSIS

change circuit-packs cabinet number

PERMISSIONS

The following default logins may execute this command: system technician, cust, inads, init, nms.

EXAMPLES

change circuit-packs 1
change circuit-packs 2

DESCRIPTION

This command allows the user to administer the circuit packs that are to be inserted into the system port, expansion control, and switch node carriers. It is used to configure the system when the circuit packs have not yet been physically inserted.

Defaults

If no cabinet number is entered, this value defaults to "1."

Parameters

cabinet number	The number of the cabinet containing the circuit packs that the user wishes to modify.

Help Messages

If the system technician presses HELP after entering "change circuit-packs" the following message is displayed:

```
Enter number between [1-3]
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If an invalid cabinet number is entered on the command line the following message will be displayed:

```
"n" Identifier not assigned
```

OUTPUT

Cabinet	The administered number of the cabinet.
Cabinet Layout	Type of cabinet (e.g., single-carrier or enhanced-multi-carrier).
Carrier	Each page of this form reports the information for a specific carrier, this field tells the user which carrier of the cabinet that this page refers to.
Carrier Type	For each carrier - A, B, C, D, or E, what its function is (e.g., port, processor or expansion-control).
Slot	Lists the slot numbers from 0 - 21 depending on the type of carrier.
Code	The circuit pack code (TN number). This number identifies the circuit pack type to the system. The proper format are the letters "TN" followed by a three digit number.
Sfx	For suffix, lists the suffix if the particular circuit pack has one.
Name	This field contains the alphanumeric name for the circuit pack. It is provided to aid the user in entering the circuit pack codes.

For the following output example, the command entered is "change circuit-packs 1" which is an enhanced-single-carrier cabinet. All five pages are shown here.

```
change circuit-packs 1                     Page   1 of   5

                        CIRCUIT PACKS
    Cabinet: 1                                  Carrier: A
 Cabinet Layout: enhanced-single-carrier Carrier Type: processor
 Slot Code  Sfx  Name                    Slot Code  Sfx  Name
                                          11:
  01: TN570      EXPANSION INTF           12:
  02: TN767  B   DS1 INTERFACE            13:
  03:                                     14:
  04:                                     15:
  05:                                     16:
  06:
  07:
  08: TN556      BRI LINE
  09: TN754      DIGITAL LINE
  10: TN769      ANALOG LINE

  '#' indicates circuit pack conflict.
```

```
change circuit-packs 1                     Page   2 of   5

                CIRCUIT PACKS

    Cabinet: 1                                Carrier: B
 Cabinet Layout: enhanced-single-carrier Carrier Type: port
 Slot Code  Sfx  Name                    Slot Code  Sfx  Name
  00:                                     11:
  01: TN754      DIGITAL LINE             12:
  02: TN754      DIGITAL LINE             13:
  03: TN754      DIGITAL LINE             14:
  04: TN754      DIGITAL LINE             15:
  05: TN754      DIGITAL LINE             16:
  06: TN754      DIGITAL LINE             17:
  07: TN754      DIGITAL LINE             18:
  08: TN754      DIGITAL LINE             19:
  09: TN754      DIGITAL LINE             20:
  10: TN754      DIGITAL LINE

  '#' indicates circuit pack conflict.
```

```
change circuit-packs 1                      Page   3 of   5

                           CIRCUIT PACKS

    Cabinet: 1                                  Carrier: C
 Cabinet Layout: enhanced-single-carrier Carrier Type: port
 Slot Code  Sfx  Name                    Slot Code  Sfx  Name
  00:                                     11: TN754    DIGITAL LINE
  01: TN748  C   TONE DETECTOR            12: TN753    DID TRUNK
  02:                                     13: TN742    ANALOG LINE
  03:                                     14: TN760  C   TIE TRUNK
  04: TN771  C   MAINTENANCE/TEST         15: TN747  B   CO TRUNK
  05: TN748  B   TONE DETECTOR            16: TN742    ANALOG LINE
  06: TN767      DS1 INTERFACE            17: TN556    BRI LINE
  07: TN742      ANALOG LINE              18: TN742    ANALOG LINE
  08: TN762  B   HYBRID LINE              19:
  09: TN742      ANALOG LINE              20: TN754    DIGITAL LINE
  10:

  '#' indicates circuit pack conflict.
```

```
change circuit-packs 1                      Page   4 of   5
                CIRCUIT PACKS
    Cabinet: 1                              Carrier: D
 Cabinet Layout: enhanced-single-carrier Carrier Type: port
 Slot Code  Sfx  Name                    Slot Code  Sfx  Name
  00:                                     11:
  01:                                     12: TN722  B   DS1 TIE TRUNK
  02:                                     13: TN760  C   TIE TRUNK
  03: TN750  B   ANNOUNCEMENT             14:
  04:                                     15: TN754    DIGITAL LINE
  05:                                     16:
  06:                                     17: TN742    ANALOG LINE
  07: TN747  B   CO TRUNK                 18:
  08: TN753      DID TRUNK                19:
  09: TN742      ANALOG LINE              20:
  10:
  '#' indicates circuit pack conflict.
```

```
change circuit-packs 1                      Page   5 of   5

                CIRCUIT PACKS

    Cabinet: 1                               Carrier: E
 Cabinet Layout: enhanced-single-carrier Carrier Type: port
 Slot Code  Sfx  Name                    Slot Code  Sfx  Name
                                          11:
  01: TN570      EXPANSION INTF           12:
  02: TN747  B   CO TRUNK                 13:
  03: TN747  B   CO TRUNK                 14:
  04: TN747  B   CO TRUNK                 15:
  05: TN747  B   CO TRUNK                 16:
  06: TN747  B   CO TRUNK                 17:
  07:                                     18:
  08:                                     19:
  09:                                     20:
  10:

  '#' indicates circuit pack conflict.
```

FEATURE INTERACTIONS

None.

change synchronization

This command changes/updates the translation data associated with the existing synchronization hierarchy.

SYNOPSIS

change synchronization

PERMISSIONS

The following logins may execute this command: system technician, cust, inads, init, rcust, bcms.

EXAMPLES

change synchronization
change synch

DESCRIPTION

The change synchronization command changes/updates the translation data associated with the existing synchronization hierarchy.

A hierarchy of sources exists within each system that should be used for timing synchronization. For stratum 3 synchronization, this hierarchy should be reflected by the DS1 inputs to the external stratum 3 clock. For stratum 4 synchronization, this hierarchy should be reflected in the primary and secondary fields. If all fields are left blank then the tone clock board within each port network will provide timing for that port network.

Defaults

None.

Parameters

None.

Help Messages

If the user presses HELP after entering "change synchronization" the following message is displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict.
```

OUTPUT/INPUT

Stratum: This field specifies the synchronization stratum that will be used. The only entries that are acceptable are "3" and "4." If "4" is entered in this field, the message

Primary: This field designates the first choice system synchronization source. A blank entry means no synchronization. This field is valid only if stratum 4 synchronization is specified.

— FIELD HELP:

```
Enter 5 character board number;
                cabinet(1-3):carrier(A-E):slot(0-21)
```

— FIELD ERROR(S):

- — "entry" Board location invalid
- — "entry" Circuit Pack must be a DS1 or a UDS1 board
- — "entry" Circuit pack must be installed first
- — Cannot administer synchronization sources on a port network remoted via DS1C

Secondary: This field designates the second choice system synchronization source. A blank entry means no synchronization. This field is valid only if stratum 4 synchronization is specified.

— FIELD HELP:

```
Enter 5 character board number; cabinet(1-3):carrier(A-E):
 slot(0-21)
```

— FIELD ERROR(S):

- — "entry" Board location invalid
- — "entry" Circuit Pack must be a DS1 or a UDS1 board
- — "entry" Circuit pack must be installed first
- — Secondary source requires primary synchronization source
- — Duplicate entry
- — Synchronization sources must be in same port network

Location: The circuit pack location (port network, carrier and board slot) of all administered DS1 circuit packs are listed here.

Name: If a user defined name is administered for the DS1 circuit pack, it will be displayed here. Blank means no user defined name was given to this DS1 circuit pack.

Slip: If the DS1 circuit pack has slip alarm, this field will show 'y'. Otherwise it will show 'n'.

Port Network: This field is only valid for stratum 3 synchronization. The field is a display only field and specifies the port network that supplies synchronization via the tone clock circuit pack.

For the following example, the command that was entered is "change synchronization" and "4" was entered in the stratum field.

```
change synchronization                      Page   1 of   1

             SYNCHRONIZATION PLAN

      SYNCHRONIZATION SOURCE (DS1 circuit pack location)
          Stratum: 4
          Primary: _____    Secondary: _____
Location  Name    Slip        Location  Name    Slip

 NOTE: TN722B DS1 source will result in stratum 4, type II synchronization
```

For the following example, the command that was entered is "change synchronization" and "3" was entered in the stratum field.

```
change synchronization                      Page   1 of   1

             SYNCHRONIZATION PLAN

      SYNCHRONIZATION SOURCE (DS1 circuit pack location)
            Stratum: 3
       Port Network: 1
```

FEATURE INTERACTIONS

A DS1 interface or a UDS1 board that has been selected as either a primary or secondary synchronization source cannot be removed on the DS1 circuit pack administration form or the regular circuit pack administration form.

Change System-Parameters Maintenance

change system-parameters maintenance

The maintenance-related system parameters form is used to specify and display scheduled maintenance operations and maintenance support functions.

This form can also be used to activate and deactivate INADS alarm origination when performing repairs. To deactivate alarm origination:

1. Make a note of the current entries in the Cleared Alarm Notification, CPE Alarm, and Alarm Origination Activated fields so you can restore them when you are done.
2. If Cleared Alarm Notification field = "y," change it to "n."
3. If Alarm Origination to OSS Numbers field is not "neither," change it to "neither."
4. If CPE Alarm Activation Level field is "major," "minor," or "warning," change to "none."
5. If daily scheduled maintenance must be prevented from starting during a maintenance procedure, set the `Start Time` field to a time after the session will end. If daily Scheduled Maintenance is already running and needs to be shut off, set the `Stop Time` field to one minute after the current time.
6. Press ENTER and verify that the screen displays the message:

   `Command successfully completed`

NOTE:
When finished working on the switch be sure to return all fields to their original settings.

EXAMPLES

change system-parameters maintenance

Output

An input form is displayed with the following fields. Defaults for data entry fields are listed in parentheses.

Operations Support Parameters

Product Identification	This is a 10-digit number starting with 1 that identifies the switch to an Operations Support System (OSS), for example, INADS.
First OSS Telephone Number	The first telephone number that the switch uses to report alarms to, for example, INADS or Trouble Tracker. The number must be obtained from the National Customer Support Center (NCSC) or the TSC. **#** and ***** are not allowed in the telephone number.
Abbrev Alarm Report	Enables the Abbreviated Alarm Report feature for the first OSS. (yes)
Second OSS Telephone Number	The second telephone number that the switch uses to report alarms to, for example, INADS or Definity SNMP. The number must be obtained from the National Customer Support Center (NCSC) or the TSC. **#** and ***** are not allowed in the telephone number.
Abbrev Alarm Report	Enables the Abbreviated Alarm Report feature for the second OSS. (no)
Alarm Origination to OSS Numbers	Indicates one of four options for alarm origination (neither): ■ If this field is set to “both,” all Major and Minor alarms result in an automatic call to both OSS telephone numbers. Both OSS telephone numbers must be administered. ■ If this field is set to “first-only,” all Major and Minor alarms result in an automatic call to the first OSS number only. The switch does not call the second OSS telephone number even if the number is administered. The first OSS telephone number must be administered ■ If this field is set to “neither,” alarm origination does not take place. Warning alarms are not reported to either numbers. ■ If this field is set to “second-as-backup,” all Major and Minor alarms result in an automatic call to the first OSS telephone number. If calling the first OSS telephone number fails four attempts, the switch starts to call the second OSS telephone number as a backup until calling the first OSS telephone number becomes successful. Both OSS telephone numbers must be administered.
Cleared Alarm Notification	Enables the switch to originate a call to the OSS and send an alarm resolution message whenever all previously reported Major and Minor alarms are resolved. Alarm Origination must be activated in order for Cleared Alarm Notification to work. (no)
Restart Notification	Enables the switch to originate a call to the OSS and report any system restarts caused by problems with the switch.

Test Remote Access Port	Specifies whether testing of the remote access port on the SYSAM circuit pack is enabled. This field should be set to "yes" whenever there is an INADS line connected to the switch and there is a maintenance contract in effect so that alarm origination capability is maintained. If no equipment is connected to the remote access port, or if a trunk for remote access and alarm origination is not provided, running tests on the remote access port on the SYSAM results in test failures. This causes unnecessary maintenance alarms and allows potentially destructive tests to be run. Setting this field to "no" prevents this. (no)
CPE Alarm Activation Level	Indicates the minimum level (Major, Minor or Warning) at which the Customer-Provided Equipment (CPE) alarm is activated. If the level is ''none,'' the CPE does is not activated for any alarm. (none) **NOTE:** The CPE alarm is always activated when the switch goes into Emergency Transfer, regardless of the CPE Alarm Activation Level setting.

Packet Bus Activated	Enables the system Packet Bus. If this field is set to ‘‘yes'', then maintenance software assumes that there is a Packet Control circuit pack installed in the system. The packet endpoints (for example, ASAI, and/or BRI) may be administered, and maintenance testing runs on both the Packet Control circuit pack and on the Packet Bus (This field should be set to “yes” after a packet control circuit pack is installed.). If a Packet Control circuit pack is not installed in the system, then a major alarm is raised against the PKT-CTRL MO. This field can only be changed from ‘‘yes'' to ‘‘no'' if there are no packet endpoints administered, thus ensuring that there can be no packet endpoints administered if the packet bus is not activated. This field should be set to “yes” after a Packet Control circuit pack is installed. If a Packet Control circuit pack is not installed, then this field should be set to ‘‘no'' (the only exception is when setting up translations for a system for which not all of the required hardware is available). (no)
Customer Access to INADS Port	Provides the capability to prohibit access to system administration and maintenance interface, via the INADS port when using customer login ID’s. This field can only be activated by Lucent Technologies services through system-parameters maintenance administration.(no)
Repeat Dial Interval (MMS)	Indicates the number of minutes that the system must wait before attempting another call origination to an OSS. This timer is triggered by the lack of a far-end acknowledgment. (7)

Scheduled Maintenance

A series of maintenance tests and operations runs automatically every day according to the schedule and settings specified in the following fields

Table 10-4. Scheduled Maintenance Settings

Start Time	The hour and minute in 24-hour notation at which daily scheduled maintenance will begin running. (22:00)
Stop Time	The hour and minute when scheduled daily maintenance will stop running. If any daily maintenance operations are not completed by this time, the system will note where in the sequence it stopped and perform those operations during the next scheduled daily maintenance.
Daily Maintenance	This display-only field simply represents the series of tests that are always run by maintenance software as part of daily maintenance.
Save Translation	This field indicates on which days translation data in memory will automatically be saved to the Mass Storage System disk and/or tape devices during scheduled maintenance. The save operation is first made to disk, followed by a disk backup to tape. On systems with duplicated SPEs, translation data is saved on both SPEs. Valid entries are **daily**, days of the week, or **no**. "No" specifies that no automatic saves are to be executed. (daily)
Control Channel Interchange	Each port network has a pair of TDM busses called A and B, each of which has a set of time slots dedicated to use by the control channel. At any one time, the control channel in each PN is carried on only one of the two busses. This field indicates on which days the control channel in each port network will be switched from one of the paired TDM busses to the other. Valid entries are **daily**, days of the week, or **no**. "No" specifies that no interchange be executed. (no)

Continued on next page

Table 10-4. Scheduled Maintenance Settings — *Continued*

System Clocks Interchange	On High and Critical Reliability systems, this option causes a Tone-Clock interchange in each port network with duplicated Tone-Clock circuit packs. Each port network interchanges into the standby Tone-Clock for 20 seconds and then back to the Tone-Clock that was originally active. This field indicates on which days the interchanges are to take place. Valid entries are daily, days of the week, or no. "No" specifies that interchanges be executed. (no) The system performs a Tone-Clock interchange, making the stand by Tone-Clock active. The newly active Tone-Clock circuit pack is tested and, while active, provides system clocks for the port network in which it resides. The system then interchanges back to the originally active Tone-Clock circuit pack.
SPE Interchange	On systems with duplicated SPEs, this field indicates on which days an SPE interchange will be executed during scheduled maintenance. Valid entries are **daily**, days of the week, or **no**. "No" specifies no scheduled interchanges. (no)
EXP-LINK Interchange	This field indicates whether or not the expansion links between port-networks are interchanged as part of scheduled maintenance. The value ‘‘daily'' means that EXP-LINK interchange occurs automatically everyday. The value ‘‘no'' means that EXP-LINK interchange is not done automatically as part of scheduled maintenance. Values represented by the days of the week mean that EXP-LINK interchange occurs automatically on the specified day only. Since EXP-LINK interchange only applies to duplicated systems, simplex systems do not display this field. (no)

Continued on next page

Table 10-4. Scheduled Maintenance Settings — *Continued*

Minimum Threshold for TTRs	When the number of touch tone receivers (TTRs) in service falls below this number (4 to 200), a WARNING alarm is raised against TTR-LEV (see TTR-LEV in Chapter 11, "Maintenance Object Repair Procedures"). These are also known as dual-tone multifrequency receivers (DTMRs). There are 4 TTRs on each TN748 Tone Detector circuit pack, and up to 50 TN748s in a system. To alarm the first occurrence of a TTR being taken out of service, set this field to 4 times the number of TN748s. If this number is set to more than three less than the total number of TTRs, a port network with only one TN748 could lose all of its TTRs before this alarm is raised.
Minimum Threshold for CPTRs	When the number of call progress tone receivers in service falls below this number (2 to 100), a WARNING alarm is raised against TTR-LEV (see TTR-LEV in Chapter 11, "Maintenance Object Repair Procedures"). These are also known as general purpose tone detectors (GPTDs). There are 2 CPTRs on each TN748 Tone Detector circuit pack, and up to 50 TN748s in a system. To alarm the first occurrence of a CPTR being taken out of service, set this field to 2 times the number of TN748s. If this number is set to more than one less than the total number of TTRs, a port network with only one TN748 could lose all of its CPTRs before this alarm is raised.
Minimum Threshold for Call Classifier Ports	When the number of call classifier ports (CLSFY-PTs) in service falls below this number, a WARNING alarm is raised against TTR-LEV (see TTR-LEV in Chapter 11, "Maintenance Object Repair Procedures"). Valid entries are 1 to 200. There are 8 ports on each TN744 Call Classifier circuit pack, and up to 25 TN744s in a system. To alarm the first occurrence of a CLSFY-PT being taken out of service, set this field to 8 times the number of TN744s. If this number is set to more than 7 less than the total number of CSLFY-PTs in the system, a port network with only one TN744 could lose all of its CLSFY-PTS before the alarm is raised. If there are no TN744s in the system, leave this field blank.

Continued on next page

Table 10-4. Scheduled Maintenance Settings — *Continued*

Test Type 100, Test Type 102, Test Type 105	An extension assigned to receive tie-trunk calls from other switches with test line origination capability. The system responds by sending a sequence of test tones. Test Type 100 tests far end to near end loss and C-message by sending: ■ 5.5 seconds of 1004 Hz tone at 0dB ■ Quiet until disconnect; disconnect is forced after one minute Test Type 102 tests far end to near end loss by sending: ■ 9 seconds of 1004 Hz tone at 0dB ■ 1 second of quiet ■ This cycle is repeated until disconnect; disconnect is forced after 24 hours. Test Type 105 tests 2-way loss, gain slope, and C-message and C-notch noise by sending: ■ nine seconds of 1004 Hz at -16dB ■ one second of quiet ■ nine seconds of 404 Hz at -16dB ■ one second of quiet ■ nine seconds of 2804 Hz at -16dB ■ 30 seconds of quiet ■ one half second of Test Progress Tone (2225 Hz) ■ approximately five seconds of quiet ■ forced disconnect
ISDN-PRI Test Call Extension	The extension used by a far-end ISDN node to place a call to the system to test the ISDN-PRI trunks between the far-end and the system.

Continued on next page

Table 10-4. Scheduled Maintenance Settings — *Continued*

ISDN-BRI Service SPID	This field shows whether or not the link is associated with the Service SPID. If the link is associated with the Service SPID, the field contains a number from "0 to 99999" this number is the test spid (See SPID Facility Test in Chapter 11, "Maintenance Object Repair Procedures" under BRI-SET MO) otherwise, this field is blank. Service SPID is a feature used by the system technician to check building wiring between the switch and the BRI endpoint.
DSO Loop-Around Test Call Extension	The extension used by the network service provider to set up a DSO loop around connection for testing non-ISDN DS1 trunks The DSO Loop-Around Test Call feature is used primarily for testing DSO channels associated with non ISDN-PRI trunks. The loop-around is activated by dialing the test extension number. Multiple DSO Loop-Around connections can be set up by placing multiple calls to the loop-around extension. For more information see "Facility Test Calls" in Chapter 5, "Routine Maintenance Procedures".
Loss Plan	Use only when extra loss is required to maintain quality of transmission on conference calls. Leave this field blank if no extra loss is required. If extra loss is required, enter digits as shown below.

No. Of Parties To Be Conferenced	Enter Digit
3	2
4	3
5	4
6	5
7	6

SPE Optional Boards:	These fields indicate whether a Disk circuit pack is present in the system, and which Packet Interface slots are administered. If a Packet Interface circuit pack is physically present, the corresponding Packet Interface field is set to y when the system boots, and no change to that field is allowed. If the system is equipped with duplicated SPEs, a Packet Interface field is set to y when either SPE carrier contains a Packet Interface circuit pack in the corresponding position. If a Packet Interface circuit pack is not present, then the value for the Packet Interface field is read from translation data stored on disk or tape. If the field is set to n, a Packet Interface circuit pack may be administered by changing the corresponding Packet Interface field to y.

Modem Connection

On page 3 of the example forms shown below, there are 11 fields that are hidden when the “Modem Connection?” field is set to internal. In this example the “Modem Connection” field is set to “external” and these additional 11 fields are visible.

The first 2 fields on page 3 help setup the data format for the serial data from the switch to the modem. The field names are, “Data Bits:”, and “Parity?”. There are only two valid combinations for these 2 fields:

- Data Bits = 8, Parity = None
- Data Bits = 7, Parity =(odd , even, mark, or space)

The remaining fields are listed below:

Modem Connection	The only valid entries for this field are “internal” or “external”. The default is set to internal. (internal)
Modem Name	This field is 20 characters long and will permit alpha-numeric characters to provide a unique qualifier for a given modem. The field is called “Modem Name: ”. ( )
RTS/CTS Enabled	This field will inform the modem that communication with the data source UART will be driven with RTS/CTS flow control. This field is 6 characters long with a default of “\Q3”. This field is case in-sensitive; however, the default will be in upper case. (\Q3)

Asynchronous Data Mode	This field will configure the modem as an asynchronous communications device. This field is 8 characters long with a default of “&M0&Q0”. This field is case in-sensitive; however, the default will be in upper case. (&M0&Q0)
DTE Auto-Data Speed	This option will adjust the speed of the data source (DTE) UART to the outgoing (modem-to-modem) data rate. So, at maximum this speed would be 9600 baud. This field is 6 characters long with a blank as default . This field is case in-sensitive. ( )
Disable Data Compression	This field will turn off the default data compression algorithms that are in use by most consumer modems. This field is 6 characters long with blank as the default. The AT commands that control this capability are supported by similar commands; however, these commands do not operate in the same manner. The Intel modems require the use of “H%C0” to disable V.42bis & MNP Class 5 data compression algorithms; however, the Paradyne products only use “%C0” to disable both algorithms. This field is case in-sensitive; with blank as the default. ( )
Enable Error Control	This field will turn on the V.42 LAPM and MNP error control protocols, if available on the modem. This field is 6 characters long with “blank” as the default. This V.42/MNP/Buffer mode first attempts to negotiate V.42 error control with the remote modem. If this fails, then the modem transitions to MNP, and if this fails then no error control is used. This field is case in-sensitive. ( )

Misc. Init. Param	This field is 20 characters long with blank as the default. This field supports any initialization parameters that are not already specified. The AT commands specified in this free-form field will be always the last initialization parameters to be sent to the external modem. This field is case in-sensitive; however, the default will be in upper case. ( )
Auto-Answer Ring Count	This field controls the number of rings required before the modem will automatically answer an incoming call. This field is 6 characters long with “S0=10” as the default. Typically, the maximum permissible value for this register is 255. The values 1-255 denote the number of incoming ring cycles. This field is case in-sensitive; however, the default will be in upper case. (S0=10)
Dial Type	This field controls the type of inter-register signaling to be used between the modem and the Central Office. The field name is “Dial Type: ” with a default of ”T “ for tone dialing. Pulse dialing is indicated by “P”. The field length should be 3 characters long. This field will be concatenated with the dial string. This field will be case in-sensitive; however, the default will be in upper case. (T)

Adjustable Make/Break Ratio	This field can be of particular importance when using a modem that may be transferable from country to country. The intent of this field is to control the make/break ratios of pulses and DTMF dialing. The Intel product information has support for the different make/break options for pulse dialing only. Intel uses the option “&P0” to select a ratio of 39% make and 61% break for communication within the U.S. and Canada. The option “&P1” sets a ration of 33% make and 67% break for the U.K. and Hong Kong. This field is 5 characters long with blank as the default. This field will be case in-sensitive. ( )
Dial Command	This field is 3 characters long with “D” as the default.. This field simply denotes the dialing command of the modem. This is a fairly standard command. This field will be case in-sensitive; however, the default will be in upper case. (D)
No Answer Time-Out	Most off-the-shelf external modems provide a timer that abandons any outbound data call after a predetermined interval. Some modems provide for this timer to be disabled, thus allowing an outbound call to ring indefinitely. AT&T Paradyne does not provide this capability with their modem line, because it is generally undesirable to have an outbound call attempt ring indefinitely. The internal modem must have this parameter disabled or set to at least 255 seconds. This is a non-administrable parameter. For the external modem connection, this parameter will be the first initialization string to be transmitted to the external modem. This field will be visible on the administration form in display mode only. This hardcoded constant can be overriden for type approval applications, specifically in the U.K and other Western European nations, by the use of the “Misc. Init. Param:” field. (S7=255)

The following display shows a typical result when **change system-parameters maintenance** is entered

```
change system-parameters maintenance                        Page   1 of 3
                   MAINTENANCE-RELATED SYSTEM PARAMETERS

OPERATIONS SUPPORT PARAMETERS
            Product Identification: 1000000000
        First OSS Telephone Number: 5551212          Abbrev Alarm Report? y
       Second OSS Telephone Number: 5551213          Abbrev Alarm Report? n
  Alarm Origination to OSS Numbers: both
        Cleared Alarm Notification? y
              Restart Notification? y
           Test Remote Access Port? n
        CPE Alarm Activation Level: none
              Packet Bus Activated? n
     Customer Access to INADS Port? n
       Repeat Dial Interval (mins): 7

SCHEDULED MAINTENANCE
                  Start Time: 22: 00                   Stop Time: 04: 00
           Daily Maintenance: daily             Save Translation: daily
 Control Channel Interchange: no       System Clocks Interchange: no
            SPE Interchange: no             EXP-LINK Interchange: no
```

```
change system-parameters maintenance          Page 2 of 3

        MAINTENANCE-RELATED SYSTEM PARAMETERS

MAINTENANCE THRESHOLDS ( Before Notification )
  Minimum Threshold for TTRs: 4_    Minimum Threshold for CPTRs: 1_
  Minimum Threshold for Call Classifier Ports: _

TERMINATING TRUNK TRANSMISSION TEST (Extension)
  Test Type 100:        Test Type 102:         Test Type 105:

ISDN MAINTENANCE
   ISDN-PRI TEST CALL Extension: _____   ISDN BRI Service SPID: _____

DS1 MAINTENANCE
   DSO Loop-Around Test Call Extension: _____

LOSS PLAN (Leave Blank if no Extra Loss is Required)
   Minimum Number of Parties in a Conference Before Adding Extra Loss: _____

SPE OPTIONAL BOARDS
 Disk? y   Packet Intf1? y   Packet Intf2? n     Packet Intf3? n
```

```
   change system-parameters maintenance           Page 3 of 3

           MAINTENANCE-RELATED SYSTEM PARAMETERS

        Modem Connection: external
               Data Bits: 8
                  Parity: none

              Modem Name: intel

         RTS/CTS Enabled: \Q3       Auto Answer Ring Count (rings): S0=10
  Asynchronous Data Mode: &M0&Q0                         Dial Type: T
     DTE Auto-Data Speed: \J1          Adjustable Make/Break Ratio: &P0
Disable Data Compression: H0%C0                       Dial Command: D
    Enable Error Control: \N3                  No Answer Time-out: S7=255
       Misc. Init. Param: ____________________



Help/Error Message Line
Command Line
```

3clear audits

This command is used to clear the cumulative and/or peak hour's data that has been collected about the status of each data relation audit.

SYNOPSIS

clear audits [cumulative **|** peak-hour]

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

clear audits cumulative
clear audits peak-hour

DESCRIPTION

This command is used to clear the cumulative and/or peak hour's data that has been collected for each data relation audit. The purpose of this command is to clear old data so that when the "status audits" command is used only data collected since the last "clear audits" command is displayed. With this command, the user can clear the peak hour's data that has been collected or both the peak hour and cumulative data (refer to the "status audits" manual page for more information).

Defaults

None

Parameters

cumulative	This option will cause the data collected since the last reboot or "clear audits cumulative" command and the data collected about the peak hour to be cleared.
peak-hour	This option will cause the data collected about the peak hour to be cleared.

Help Messages

If the technician presses HELP after entering "clear audits" the following message will be displayed:

```
peak-hour    cumulative
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear audits command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the clear audits command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, can’t complete request
```

FEATURE INTERACTIONS

The data cleared by the "clear audits" command is displayed using the "status audits" command. After the "clear audits" command is executed successfully the "display audits cumulative" and/or "display audits peak-hour" commands will only display information collected since the "clear audits" command was executed. The start date displayed on the status audits screen will reflect the time that the "clear audits" command was executed.

clear errors

This command moves errors and resolved alarms to the cleared-error list. alarms from the error log.

SYNOPSIS

clear errors

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

clear errors

DESCRIPTION

The clear errors command moves all errors and resolved alarms to the cleared-error list, thereby making room for new incoming error messages which might otherwise be dropped. This command will not clear active alarms from the alarm log. This command should be used with care because the information cleared may be lost if these entries are overwritten.

Cleared error entries will be the first entries overwritten when additional entries are needed to log new errors.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "clear errors," the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear errors command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the clear errors command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, can't complete request
```

FEATURE INTERACTIONS

Cleared errors can be displayed using the "display errors" command.

clear interface

This command will clear all values of counters maintained by the processor interface.

SYNOPSIS

clear interface location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

clear interface 01a1
clear interface 01a2
clear interface a2

DESCRIPTION

The clear interface command will cause all counter values maintained by the Processor Interface (PI) circuit pack to be reinitialized. (These counters are displayed via the status interface command which is for use in the development environment only.) The PI circuit pack is a front end processor implementing the packet layer and link layer of the BX.25 protocol, and the integrated services digital network (ISDN) procedure-D protocol.

Defaults

No defaults.

Parameters

location	The location (cabinet-carrier-position) of the processor interface. The position determines which processor interface circuit pack will be cleared. A position of 1 is the first processor interface in the carrier, while a position of 2 is the second processor interface in the carrier.

Help Messages

If the system technician presses HELP after entering "clear interface," the following message will be displayed:

```
Enter location: [cabinet(1)], carrier(A-B), pos(1-2)
```

Error Messages

If the specified carrier is not the active PE, the following message will be displayed:

`Command must be executed from active SPE`

If the technician-entered cabinet and carrier is invalid for a PPN, the following message will be displayed:

`Invalid port-network specified`

If the technician-entered carrier is not a valid carrier, the following message will be displayed:

`Invalid carrier specified`

If the technician-entered carrier is not active, the following message will be displayed:

`Board invalid`

If there isn't a processor interface circuit pack administered for the specified position, but the specified carrier is active, the following error message will be displayed:

`Processor Interface (TN765) not started or is being started`

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

`'login id':'command' has a command conflict`

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

`Command resources busy; Press CANCEL to clear, and then resubmit`

If all of the available maintenance resources are currently in use, then the following message will be displayed:

`All maintenance resources busy; try again later`

OUTPUT

If the clear interface command is successful, the following message will be displayed on the SAT:

`Command successfully completed`

If the clear interface command is unsuccessful, the following message will be displayed on the SAT:

`Error encountered, can't complete request`

FEATURE INTERACTIONS

None.

clear isdn-testcall

This command cancels a ISDN-PRI test call already in progress.

SYNOPSIS

clear isdn-testcall group number/member number

PERMISSIONS

The following default logins may execute this command: system technician, inads, init

EXAMPLES

clear isdn-testcall 80/1
clear isdn-testcall 78/2

DESCRIPTION

The clear isdn-testcall command cancels an ISDN-PRI test call if one is currently in progress. Once a running test call is cleared, another test call is allowed to run.

Defaults

None.

Parameters

group number	The group number is an administered number associated with each trunk group.
member number	The member number is an administered number identifying a particular trunk within a trunk group.

Help Messages

If the system technician presses HELP after entering "clear isdn-testcall," the following is displayed:

```
Enter group #/member #
```

Error Messages

If the specified format of the trunk location is incorrect, the following message is displayed:

```
Format invalid
```

If the specified trunk group or member range is invalid, the following message is displayed:

```
Trunk or trunk group invalid
```

If a trunk group and member is not specified, the following message is displayed:

```
Must specify group/member pair
```

If the specified trunk group is not administered or has no members administered, the following message is displayed:

```
Group not assigned, or group assigned but with no member
```

If the specified trunk group member is not administered, the following message is displayed:

```
Group member not assigned
```

If the board on which the port resides is not administered, the following message is displayed:

```
Port not assigned
```

If a test call is currently not in progress when the command is entered, the following message is displayed:

```
Test Call not in progress
```

If the specified trunk is not an ISDN-PRI trunk, the following message is displayed:

```
Invalid non ISDN-PRI trunk specified
```

If the test call has already completed, the following message is displayed:

```
Test Call already terminated
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear isdn-testcall command is successful, the following message is displayed on the SAT:

```
Command successfully completed
```

If the clear isdn-testcall command is unsuccessful, the following message is displayed on the SAT:

```
Error encountered, can’t complete request
```

FEATURE INTERACTIONS

None.

clear link

This command will clear a link by performing a reset.

SYNOPSIS

clear link link-id

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

clear link 1
clear link 8

DESCRIPTION

The clear link command will clear the hardware error counters associated with the ports on the Processor Interface circuit pack (displayed via the status link command).

Defaults

None.

Parameters

link-id	The link-id is a number associated with each link (1-8). The link number is assigned via the communication-interface links form.

Help Messages

If the system technician presses HELP after entering "clear link," the following message will be displayed:

```
Enter 1 character link number
```

Error Messages

If the link identifier is not within the valid range, the following error message is displayed:

```
Link out of range, please press HELP
```

If the link is not administered, the following error message is displayed:

```
Link not administered or not enabled
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear link command is successful, the following message is displayed on the SAT:

```
Command successfully completed
```

If the clear link command is unsuccessful, the following message is displayed on the SAT:

```
Error encountered, can't complete request
```

FEATURE INTERACTIONS

None.

clear mst

This command will clear the trace buffer.

SYNOPSIS

clear mst

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

clear mst

DESCRIPTION

The clear mst command will clear the message trace buffer. This command is usually used before enabling the trace. It may be used while the trace is enabled to clear unwanted data.

Defaults

None.

Parameters

None.

Help Messages

If HELP is pressed after entering "clear mst," the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. A conflict could occur if another user was executing an enable, disable or clear message sequence trace command at the same time. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

After the user has entered the command the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

clear pkt

This command forces a packet bus 'clear stimuli' to be sent over the packet bus.

SYNOPSIS

clear pkt port-network location

PERMISSIONS

The following default logins may execute this command: cust, inads, init.

EXAMPLES

clear pkt port-network 1

DESCRIPTION

This command provides the mechanism that will give a system technician the tool to resolve problems where the packet bus is not providing service to the system.

Parameters

location	A "location" represents the physical position of the packet bus that will be forced to send a 'clear stimuli' to all boards connected to it. A digit (1 - 3) must be entered.

Help Messages

If the system technician presses HELP after entering "clear pkt," the following message will be displayed:

```
Enter port-network; port network number (1-3)
```

Error Messages

If the packet bus is not administered, the following error message will be displayed:

```
Packet Bus is not activated, check system-parameters maintenance form
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear pkt command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

FEATURE INTERACTIONS

None. For additional information please refer to EDD document 23154.

clear port

This command removes the maintenance mark from a port.

SYNOPSIS

clear port location

PERMISSIONS

The following default logins may execute this command: cust, inads, init, nms.

EXAMPLES

clear port 01c1102

DESCRIPTION

This command is used in conjunction with the "mark port" command. This command will remove the mark from the port and allow it to be usable.

Parameters

location	A "location" represents the physical position of the port to be busied out and is entered as "UUcSSrr" where "UU" represents the cabinet number, "c" represents the carrier, "SS" represents the slot position, and "rr" represents the circuit (port). A single digit cabinet (1 - 9) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "clear port," the following message will be displayed:

```
Enter 7 character port number
```

Error Messages

If the port is not administered, the following error message will be displayed:

```
Port not marked
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the clear port command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the clear port command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, cannot complete request
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

copy update-file

This command provides a mechanism for copying a field update file from the active SPE to the standby SPE

SYNOPSIS

copy update-file *override*

PERMISSIONS

The following default logins may execute this command: inads and init.

EXAMPLES

copy update-file
copy update-file override

DESCRIPTION

In a Duplex system only, the copy update-file will copy a field update file from the active SPE to the standby SPE. This command is intended to permit the user to recover from situations whereby the standby SPE was not available when a field update("patch") file was downloaded to the switch. All validation checks are made on the standby as it receives the file. If there is a newer, valid update file on the standby, the override option must be used to force the copy.

Parameters

override	The override parameter allows the user to copy the update file from the active SPE to the standby SPE regardless of the dates.

Help Messages

If the system technician presses HELP after entering "copy update-file" on a duplex SPE system the following message is displayed:

```
['override']
```

Error Messages

If the standby SPE contains a newer patch file than the active SPE and the override option was NOT used, the following message is displayed:

```
Active SPE's update file is older than standby's
```

If the vintage of the standby SPE doesn't match the vintage of the active SPE, the following message is displayed:

```
Update file vintage does not match standby SPE core vintage
```

If there is no update file on active processor, the following message is displayed:

```
No update file on tape
```

If the standby SPE is NOT in standby mode, the following message is displayed: is displayed:

```
Cannot access the standby SPE at this time
```

If the active SPE cannot establish a communication path to the standby SPE, the following message is displayed:

```
Could not establish netcon data call between SPE's
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the update file is too large to fit on device, the following message is displayed:

```
Update file is too large to fit on device
```

If the checksum of the files is not correct, the following message is displayed:

```
Update file checksum failed
```

If the update is successful the following message is displayed:

```
Command completed successfully
```

OUTPUT

None.

FEATURE INTERACTIONS

386 System:

The form displayed for the list configuration software-vintage command has been modified to reflect the changes imposed by the flash architecture. The form is basically the same as for the tape based Intel system, but does not include fields such as "Tape Resident Vintage" which don't apply to 386 systems. It is these differences in the "list configuration software" command that should allow INADS to determine, with one query, the hardware configuration, software vintage and patch identifier.

There is no interaction with routine periodic or scheduled maintenance because patches are only applied on restarts before the system is in normal operation.

The flash checksum test acts as a backup check to make sure the entire field update file was applied correctly. It can fail because of a bad checksum update from a poorly constructed update file or because the patching operation has aborted. When the flash Checksum Test fails, a MAJOR on-board alarm is raised on the processor/memory circuit pack. Maintenance runs a data consistency test on a daily basis to check that copies of translations, announcements and software files are consistent across both processors in a High or Critical Reliability System. If the test detects a difference, a minor, off-board alarm is generated.

When checking the software, the test compares the memory resident software version and patch identifier. It also checks for the presence of a field update file and, if found, compares the old and new patch identifiers to make sure the same patch file id loaded on each processor. If the software or update files are inconsistent, the "list configuration software" command can be used to display the status of the patch file.

286 System:

The form displayed for the list configuration software-vintage is basically the same as that for the flash based Intel system, but includes the "Tape Resident" fields instead of the "Memory Card Resident" and "Flash Resident" fields which don’t apply to tape based intel systems. The "list configuration software" command allows INADS to determine, with one query, the hardware configuration, software vintage and patch identifier.

disable administered-connection

This command stops periodic and scheduled maintenance from being performed on a single administered connection or all administered connections.

SYNOPSIS

disable administered-connection [ac number | all]

PERMISSIONS

The following default logins may execute this command: inads, init, system technician, cust, rcust, mis.

EXAMPLES

disable administered-connection all
disable administered-connection 1
disable administered-connection 128

DESCRIPTION

The disable administered connection command inhibits scheduled and periodic testing from being performed on all or a single administered connection(s). This command stops the processing of in-line errors for all or the selected administered connection(s).

Defaults

None.

Parameters

ac number	The number of the administered connection being disabled.
all	If "all" is entered then all administered connections are disabled.

Help Messages

If the user presses HELP after entering "disable administered-connection," the following message will be displayed:

```
Enter assigned administered connection number(1-128) or ’all’
```

Error Messages

If the administered connection number entered is not "all" and is non numeric, the following message is displayed:

```
Identifier invalid
```

If the administered connection number entered is not within the valid range of connections, the following message is displayed:

```
Entry out of range
```

If the connection number entered is not administered, the following message is displayed:

```
Identifier not assigned
```

If the administered connection number entered is already disabled, the following message is displayed:

```
Administered connection already disabled
```

If the software data cannot be sent to the SAT, the following message will be displayed:

```
Error encountered, can’t complete request
```

If the command entered is in conflict with another currently executing command, then a message is displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

OUTPUT

After the user has entered the command and the command is successful, the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

disable mst

This command will allow the user to disable the mst.

SYNOPSIS

disable mst

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

disable mst

DESCRIPTION

The disable mst command will disable the message trace. If the trace was not already disabled for some other reason, a GAP marker will be inserted into the trace. The contents are then frozen, and can be viewed via the "list mst" command.

The command should be executed when done using the trace facility. If left enabled, the trace will continue to use CPU time until the run time limit expires.

Executing a disable mst command when the trace is already disabled will have no effect, and will indicate that it worked.

Defaults

None.

Parameters

None.

Help Messages

If the user presses HELP after entering "disable mst," the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

After the user has entered the command the following message appears at the bottom of the screen:

```
Command successfully completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

disable synchronization-switch

This command disables automatic clock switching.

SYNOPSIS

disable synchronization-switch

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

disable synchronization-switch

DESCRIPTION

The disable synchronization command stops the automatic clock switching capability of the maintenance subsystem. Clock refers to the oscillator on a tone/clock or DS1 interface.

The synchronization subsystem provides error free digital communication between the switch and other PBXs, COs, or customer premise equipment. The subsystem is made up of system components involved in synchronization: TDM bus clock, DS1 trunk board, maintenance and administration software resident in the SPE.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses help after entering "disable synchronization" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear,and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the disable synchronization command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the disable synchronization command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, can't complete request
```

If the disable command is run and synchronization is currently disabled, the following message will be displayed on the SAT:

```
Synchronization-switch already disabled
```

FEATURE INTERACTIONS

None.

disable test-number

This command stops a specified test number from being performed during demand and periodic or scheduled maintenance.

SYNOPSIS

disable test-number number *[print | schedule]*

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

disable test-number 710
disable test-number 710 print
disable test-number 510 schedule

DESCRIPTION

The disable test-number command makes the user specified test number unavailable for any maintenance testing. An enable test-number must be issued to make the test number available.

Parameters

number	The number of the test that is to be maintenance disabled.
print	If specified, this parameter will cause the information displayed by this command to be sent to the printer attached to the terminal as well as to the screen.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "disable test-number," the following message will be displayed:

```
Enter test number
```

Error Messages

If the test-number entered is not a valid system test number, the following error message will be displayed:

```
Test number invalid
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the disable test-number command is successful, the following message is displayed:

```
Command successfully completed
```

If the disable test-number command is unsuccessful, the following message is displayed:

```
Error encountered, can't complete request
```

FEATURE INTERACTIONS

None.

display alarms

This command will display an options form which allows the technician to choose which alarms are to be displayed.

SYNOPSIS

display alarms *[print | schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

display alarms
display alarms print
display alarms schedule

DESCRIPTION

The display alarms command brings up a hardware alarm report. This screen allows the technician various different options to select which alarms will be displayed on the alarm report. There are no parameters entered on the command line, parameters are selected on the hardware alarm report form instead.

An alarm can occur for any hardware object when it has been determined by the maintenance subsystem that a problem definitely exists. The impact of the problem is indicated by the alarm type:

Warning alarm—A problem which has been deemed important enough to log, or may be external to the system, but not severe enough to cause a noticeable degradation of service.

Minor alarm—A problem which could disable a local area of the system and so noticeably degrade the system.

Major alarm—A problem which widely degrades the system and seriously impairs service. This would cause a call to be placed to INADS.

A resolved alarm is a problem which has been corrected, and the alarmed component of the system is functioning correctly again. The alarm will be stamped with a resolved date and time, indicating that it is no longer a concern (any errors associated with the alarms will also be considered "resolved").

System Reboots and the Error and Alarm Logs

The system attempts to save the error and alarm logs to the memory card or tape for the 286, on the *active* SPE when any of the following events take place:

- The **save translation** command is executed.
- Translations are saved as part of scheduled maintenance (as administered on the maintenance-related system parameters form).
- A demand or software-escalated system reboot takes place.
- The PPN is about to lose all power after having been on battery backup.

Conditions such as unavailability of the MSS can prevent this attempt from succeeding.

Whenever the system reboots, the error log is restored from the disk on the SPE that becomes active with the reboot. Since the logs are saved to the disk on the SPE that was active before the reboot, the versions restored at reboot time may not be current. This occurs when either:

- The attempt to save at reboot did not succeed.
- The SPE that is active coming out of the reboot is not the same one to which the logs were last saved.

In such a case, the logs will not show the errors and alarms that have been logged since the last time a save was made to the SPE that became active with the reboot. When looking at errors that precede the last reboot, look for indications preceding the reboot to determine whether the logs restored at reboot are complete.

System resets less severe than a reboot rarely affect the error and alarm logs.

NOTE:
If there are SYSTEM errors in the Error Log, use **display initcauses** to obtain additional information. Information that could not be logged during a system reset may be found here.

Defaults

All alarms will be displayed.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [4] for more details.

There are no parameters entered on the command line, parameters are selected on the hardware alarm report form instead.

Backward Paging of the Alarm/Error Log

G3V3 and later software allows the user to display the next and previous pages of the alarm/error log. When the user executes the **display alarm/error** command to view the alarm/error log. If more than one page of alarms/errors is stored by the system, the user may use the NEXT PAGE key or the PREV PAGE key (513 or 715 terminals only use *F8* or *F7* for all other terminals) to toggle between pages (up to a maximum of two pages). If the system has storied one or less than one page of alarms/errors the command will display the alarms/errors and echo *Command successfully completed* and exit. Help messages/Key actions:

Next Page—The command will display the next page . If the user is not viewing the first page of alarms/errors, is not viewing a page as a result of depressing the *Prev Page* key, and there are more entries to display, the help message will be:

press CANCEL to abort, NEXT PAGE to complete, or PREV PAGE for previous page.

Prev Page—Press previous page key to return to the previous page. The system will display the help message:

press CANCEL to abort or NEXT PAGE for next page If the user is not viewing the first page of alarms/errors, is not currently viewing a page as a result of pressing the *prev Page* key, and there are no remaining entries to display, the help message will be:

press CANCEL to abort, NEXT PAGE to complete, or PREV PAGE for previous page.

Help Messages

If the technician presses HELP after entering "display alarms" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

FORM INPUT

After entering the command "display alarms," the system technician will be presented with an options form.

Alarm Types	The type of alarm to be displayed is specified by placing a 'y' or 'n' in the alarm type fields. The technician can choose a combination of active alarms, major, minor, warning, or resolved alarms.
Interval	Display alarm records for the last (m)onth, last (h)our, last (d)ay, last (w)eek, or (a)ll. The default is all.

From	Display alarm records from the time specified by mm/dd/hh/mm, where mm is the month, dd is the day, hh is the hour and mm is the minute. If no "from" date is entered, then no checking is done. This will give the user all the alarms active since a month prior to the current time.
To	Display alarm record to the time specified by mm/dd/hh/mm, where mm is the month, dd is the day, hh is the hour and mm is the minute. If no "to" date is entered, any alarm which is active after the from date will be selected.
Equipment Type	The technician can choose between seven different equipment types. If there is no input to any of these fields, the system will default to all the equipment. The user can select one of the following fields:

- Cabinet: This allows the technician to display all alarms associated with a particular cabinet. Alarms for a cabinet are referenced by a number ranging from 1 to 3 which is assigned during cabinet administration.
- Port Network: This allows the technician to display all alarms associated with a particular port network. Alarms for a port network are referenced by a number ranging from 1 to 3.
- Board Number: This allows the technician to choose all alarms associated with a particular circuit pack for display. Alarms for a (cabinet-carrier-slot). If the cabinet number is omitted, the system will default to 1.
- Port: This allows the technician to choose all alarms associated with a particular port on a circuit pack for display. Alarms for a port circuit are referenced by port location (cabinet-carrier-slot-circuit). If the cabinet number is omitted, the system will default to 1.
- Category: Alarms for a particular equipment category.
- Extension: Alarms associated with an extension number.
- Trunk (group/member): The technician can choose to view all alarms associated with a particular trunk group or trunk group member. The group identifier should be entered to view all alarms associated with a trunk group XXX/___. The group identifier and member identifier should both be entered to view all alarms associated with a specific trunk group member XXX/XXX.

```
display alarms                                                  Page 1 of 1
                                 ALARM REPORTS

        The following options control which alarms will be displayed.
        ALARM TYPES
                   Active? y_      Resolved? n_
                    Major? y_         Minor? y_      Warning? y_
        REPORT PERIOD
                 Interval: m_    From: __/__/__:__  To: __/__/__:__
        EQUIPMENT TYPE ( Choose only one, if any, of the following )
                              Cabinet: ____
                         Port Network: __
                         Board Number: _______
                                 Port: ________
                             Category: ________
                            Extension: _____
                Trunk ( group/member ): ___/___
```

Field Help

Following are the help messages that the system technician will see upon tabbing to the specified field and pressing the HELP key.

Active?	"n(o) y(es)"
Resolved?	"n(o) y(es)"
Major?	"n(o) y(es)"
Minor?	"n(o) y(es)"
Warning?	"n(o) y(es)"
Interval:	The interval field help is a list of objects. This list includes m(onth), h(our), d(ay), w(eek), a(ll).
	"From (month) "Enter month between 1-12"
From (day)	"Enter day between 0-31"
From (hour)	"Enter hour between 0-23"
From (minute)	"Enter minute between 0-59"
To (month)	"Enter month between 1-12"
To (day)	"Enter day between 0-31"
To (hour)	"Enter hour between 0-23"
To (minute)	"Enter minute between 0-59"
Cabinet:	"Enter cabinet number (1-3)"
Port Network:	"Enter port network number (1-3)"
Board Number:	"Enter 5 character board number; cabinet(01-3):carrier(A-E):slot(00-20)"

Port:	"Enter port number; [cabinet(1-3)]:carrier(A-E):slot(0-20):circuit(01-31)"
Category:	The category field help is a list of objects. This list includes the following: adm-conn, announce, bri/asai, card-mem, cdr, data-mod, detector, dup-spe, environ, exp-intf, ext-dev, generatr, inads-link, infc, maint, mbus, memory, misc, mnt-test, modem, netcon, pkt, pkt-ctrl pms/jrnl, procr, quick-st s-syn, stabd, stacrk, stations, sys-prnt, tape, tdm, tone, trkbd, trkcrk, trunk, wideband. For a table describing the category entries in greater detail, see the "display errors" command.
Extension:	"Enter assigned extension"
Trunk (group)	"Enter group number between 1-99"
Trunk (member)	"Enter group member between 1-99, or blank"

Field Error Messages

Following are the error messages that will be displayed on the screen. The messages are displayed when the system technician tabs out of a field and the validation routines are executed. In the following messages, an "x" represents the character that was entered by the user.

Active?	""x" is an invalid entry; please press HELP"
Resolved?	""x" is an invalid entry; please press HELP"
Major?	""x" is an invalid entry; please press HELP"
Minor?	""x" is an invalid entry; please press HELP"
Warning?	""x" is an invalid entry; please press HELP"
Interval:	""x" is an invalid entry; please press HELP"
From (month)	"Entry must be all digits"
From (day)	"Entry must be all digits"
From (hour)	"Entry must be all digits"
From (minute)	"Entry must be all digits"
To (month)	"Entry must be all digits"
To (day)	"Entry must be all digits"
To (hour)	"Entry must be all digits"
To (minute)	"Entry must be all digits"
Cabinet:	"Entry invalid"
Port Network:	"Entry invalid"
Board Number:	"Board invalid"

Port:	"Port invalid"
Category:	""xxxxxxxx" is an invalid entry; please press HELP"
Extension:	"Entry must be all digits"
Trunk (group)	"Entry must be all digits"
Trunk (member)	"Entry must be all digits"

FORM OUTPUT

After valid options are entered by the technician, an alarm report is displayed. The data displayed on this form will be:

Port	The location of the alarmed object. For installed circuit packs, the location is displayed as "cabinet-carrier-[slot]-[circuit]." For Port Network-related objects, the location is displayed as "PN UUB," where "UU" is the Port Network number and B is the bus (A or B). For Fiber Link-related objects, the location is displayed as "x a-PNC" where "x" is the Fiber Link number and "a" is the PNC side (A or B). This is the same identifier as used by the alarm log.
Maintenance Name	The logical name of the maintenance object which has been alarmed.
On Brd	Whether the fault detected is on the associated circuit pack, or an off board element connected to the circuit pack.
Alt Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Alarm Type	"MAJOR," "MINOR," or "WARNING." This is an indicator to the seriousness of the alarm raised.
Service State	"RDY" (ready for service), "OUT" (out of service), or "IN" (in service). This is the current service state of the station and trunk ports shown. If a blank is displayed in this field it means that no service state is associated with the MO.

Ack?	The columns under the “1” and “2” headings denote if the alarm has been acknowledged by the first and second OSS telephone numbers, respectively. A "y" in this field means that the alarm has been acknowledged. A "n" means that the alarm has not been acknowledged. A "c" means that the alarm resolved and cleared and the alarm notification was acknowledged. A blank means that there will be no attempt to report the alarm.
Date Alarmed	Day, hour, and minute of alarm.
Date Resolved	Day, hour, and minute of resolution. For active alarms this field will be zero (0).

For the following output example, the ENTER key was pressed immediately after entering the display alarms command.

```
display alarms

                                 ALARM REPORT

Port    Maintenance  On     Alt    Alarm   Svc   Ack?  Date        Date
        Name         Brd?   Name   Type    State 1 2   Alarmed     Resolved

02A     TONE-BD      y             MAJOR         y n  05/22/20:34 00/00/00:00
01C07   ANL-BD       y             MINOR         n n  05/22/20:26 00/00/00:00
01C0702 ANL-LINE     n      311    WARNING  IN        05/22/20:26 00/00/00:00
01C0701 ANL-LINE     n      1051   WARNING  IN        05/22/20:26 00/00/00:00
01C0703 ANL-LINE     n      1053   WARNING  IN        05/22/20:26 00/00/00:00
01C1505 CO-TRK       n      78/01  WARNING  OUT       05/22/20:26 00/00/00:00
01C1505 CO-TRK       n      78/01  WARNING  OUT       05/22/20:26 00/00/00:00
02A0201 TONE-PT      n             WARNING            05/22/20:34 00/00/00:00
02A     TDM-CLK      n             WARNING            05/23/13:43 00/00/00:00
PN 02B  TDM-BUS      n             WARNING            05/23/14:53 00/00/00:00




Command successfully completed
```

FEATURE INTERACTIONS

If the alarm origination is disabled via "change system-parameters maintenance," the "Ack?" field displays blanks no matter what the true acknowledge state is for the alarm.

display cabinet

display cabinet UU **[print | schedule]**

The display cabinet command displays the port network number, type, layout, room, floor, building, and carriers for for the specified cabinet.Output

CABINET DESCRIPTION	
Cabinet	The administered number of the cabinet.
Cabinet Layout	Type of cabinet (five-carrier or single-carrier-stack).
Cabinet Type	The type of port network housed in the cabinet (processor or expansion).
Number of Portnetworks	The number of port networks in the cabinet (1 or 2).
Room	Room where cabinet is located, if administered on the cabinet form.
Floor	Floor where cabinet is located, if administered on the cabinet form.
Building	Building where cabinet is located, if administered on the cabinet form.
CARRIER DESCRIPTION	
Carrier	Letter designation of the carrier.
Carrier Type	Port, processor, switch-node, fan or not-used.
Number	The administered port network number or switch node number.

The following display shows a typical result when **display cabinet 1** is entered.

```
display cabinet 1
                               CABINET

 CABINET DESCRIPTION
                  Cabinet: 1
           Cabinet Layout: five-carrier
             Cabinet Type: processor
   Number of Portnetworks: 1
                     Room: 30n46
                    Floor: first
                 Building: main

 CARRIER DESCRIPTION
   Carrier       Carrier Type        Number

      C        port                PN  01
      B        not-used            PN  01
      A        processor           PN  01
      X        Fan
      D        not-used            PN  01
      E        switch-node         SN  01


Command Successfully Completed
```

The following display shows a typical result when **display cabinet 3** is entered and cabinet is a stack of single-carrier-cabinets.

```
display cabinet 3
                             CABINET

 CABINET DESCRIPTION
                  Cabinet: 3
           Cabinet Layout: single-carrier-stack
             Cabinet Type: expansion-portnetwork
   Number of Portnetworks: 1
                     Room: 30n46
                    Floor: first
                 Building: main

 CARRIER DESCRIPTION
   Carrier       Carrier Type        Number

      D        not-used            PN  03
      D        not-used            PN  03
      B        port                PN  03
      A        expansion-control   PN  03
```

display communication-interface

display communication-interface
hop-channels | links | processor-channels
[print | schedule]

The display communication-interface command displays three different forms depending on the object specified by the user. See also **status link** for more details.

The **hop-channels** object displays translation data for hop channels. A hop channel is a bi-directional network channel between two interface links for DCS message hopping. A hop channel is used to tandem DCS messages from one interface link to another interface link.

The **processor-channels** object displays translation information for each of the local processor channels. A processor channel is one several data streams which are multiplexed by the X.25 protocol onto a single data link. The system has 128 total processor channels; up to 64 can be assigned to a single link.

The **links** object displays translation information for each communication interface link. A link is an electronic communication channel transmitted over the Packet Bus for carrying packet-switched data. There are 16 links which terminate at one end on the Packet Interface circuit pack in the SPE. At the physical and link layers, the link terminates at the other end on a port on the PBX's switching matrix. At a higher level, the link continues over a transmission facility to another endpoint, such as a DCS node or AUDIX. The link carries application messages between the SPE and other switches or adjuncts.

Output for Hop-channels qualifier

Link/Channel A	Identifies the first of the two link/channels joined by the hop channel. Links range from 1 to 16, channels from 1 to 64. The link/channel must not be assigned to a local processor channel, and the link must not be assigned to a PRI local processor channel.
Link/Channel B	Identifies the second of the two link/channels joined by the hop channel. Links range from 1 to 16, channels from 1 to 64. The link/channel pair must not be assigned to a local processor channel, and the link must not be assigned to a PRI local processor channel.

The number of the local processor channel used to hop the interface link channels is not shown. The following display shows a typical result when **display comm hop** is entered.

```
display communication-interface hop-channels         Page   1 of   4

                            HOP CHANNEL ASSIGNMENT

    Link/Channel A   Link/Channel B       Link/Channel A   Link/Channel B

     3     1           4     12
```

Output for Links Object

Link	**The physical link number.**
Enabled	"Yes" indicates the link is enabled for normal operation. "No," the default, indicates that message flow over the link is suppressed. The link can only be enabled if the corresponding data module has been administered.
X.25 Extension	The extension of the TN577 Packet Gateway port through which the link is routed.
Destination Number	"External" indicates the link goes to equipment connected locally to an external port on a Packet Gateway circuit pack. Such ports must show a "y" in the Establish Connection field.

Establish Connection	This field indicates whether the local switch is responsible for any part of call set-up with the far-end data module. If the physical link is through a pair of data modules, each switch terminating the link must set up a connection to its PDM/TDM. If the physical link is over a DS-1 interface, it is possible for one switch to set up the entire connection without any initiation by the other end. However, ISDN signaling links must be set to 'y' at both ends of the interface.
Connected Data Module	The extension of a PDM/MPDM directly connected to a PGATE port cable or to a a cable to an adjunct in an administered connection arrangement.
Identification	This field records the type and identification number of the machine connected to this link. This field is for informational purposes only.

The following display shows a typical result when **display communication-interface links** is entered.

```
display communication-interface links                       SPE A

                            INTERFACE LINKS

                 X.25     Destination  Establish    Connected
Link  Enabled  Extension    Number     Connection  Data Module  Identification

1:       y       5464       external       y                     AUDIX ID1
2:       n       5461       external       y           5460     AUDIX-ADM-CONN1
3:       y       5466       external       y                     CMS-ADM-CONN-2
4:       n
5:       n
6:       n
7:       n
8:       n
9:       n
10:      n
11:      n
12:      n
13:      n
14:      n
15:      n
16:      n
```

Output for Processor-Channel Object

Proc Chan	The Processor Channel denotes one of the processor channels on the processor link. With this link/logical channel pair and the one specified in the interface link and interface channel field, a network channel to a remote machine is specified. The valid range for link is 1 to 16, specifying one of the 16 interface links. Each interface link corresponds to a port on a PGATE board. The Processor channel is not administerable.
Application	This field specifies the type of application that connects to this processor channel. The following lists the valid entries:
Interface Link	The interface link to which the processor channel is connected.
Interface Chan	The channel on the interface link to which the processor channel is connected.
Local Port	The switch application port used by the local session.
Remote Port	The application port used by the remote session.
Adjunct Name	The name of the adjunct connected to this processor channel. These are defined in the Adjunct Name Form. Only AUDIX and MSA channels (AUDIX, MSAAMWL, MSAHLWC, MSALLWC, and MSAMCS) require entries in this field.
Machine-ID	This is the network machine ID for the remote machine. Machine IDs are required only for the AUDIX adjunct and DCS connections.

The following display shows a typical result for **display comm proc**.

```
display communication-interface processor-channels        Page   1 of 8

                        PROCESSOR CHANNEL ASSIGNMENT

 Proc                   Interface    Local  Remote  Adjunct
 Chan   Application    Link   Chan   Port   Port     Name     Machine-ID
   1:     dcs           3      1      1      1                    13
   2:     audix         1      1      59     11    AUDIX1        1
   3:     audix         2      1      59     11    audix2        2
   4:     gateway       1      10     59     10
   5:     gateway       1      9      59     9
   6:
   7:
   8:
   9:
  10:
  11:
  12:
  13:
  14:
  15:
  16:
```

display disabled-tests

display disabled-tests [print | schedule]

The display disabled-tests command displays the numbers off all maintenance tests that have been disabled by INADS. These tests will not be available for background or demand testing.

Output

Test Number   The numbers of the disabled tests

The following display shows a typical result when **display disabled-tests** is entered.

```
display disabled-tests                                  SPE A


                         DISABLED TEST INFORMATION

         Test Number

         710


Command successfully completed
```

display errors

This command will display an options form that allows the technician to choose which errors are to be displayed.

SYNOPSIS

display errors *high-resolution [print | schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms, browse.

EXAMPLES

display errors
display errors print
display errors schedule
display errors high-resolution print

DESCRIPTION

The display errors command brings up an error report. This screen allows the technician various different options to select which errors will be displayed on the hardware error report. There are no query parameters entered on the command line. Those type of parameters are selected on the error report form instead.

Errors can result from in-line firmware errors, periodic tests, failures detected while executing a test command, software inconsistency, or a data audit discrepancy.

System Reboots and the Error and Alarm Logs

The system attempts to save the error and alarm logs to the memory card (or tape for the 286 system), on the *active* SPE when any of the following events take place:

- — The **save translation** command is executed.
- — Translations are saved as part of scheduled maintenance (as administered on the maintenance-related system parameters form).
- — A demand or software-escalated system reboot takes place.
- — The PPN is about to lose all power after having been on battery backup.

Conditions such as unavailability of the MSS can prevent this attempt from succeeding.

Whenever the system reboots, the error log is restored from the disk on the SPE that becomes active with the reboot. Since the logs are saved to the disk on the SPE that was active before the reboot, the versions restored at reboot time may not be current. This occurs when either:

- — The attempt to save at reboot did not succeed.
- — The SPE that is active coming out of the reboot is not the same one to which the logs were last saved.

In such a case, the logs will not show the errors and alarms that have been logged since the last time a save was made to the SPE that became active with the reboot. When looking at errors that precede the last reboot, look for indications preceding the reboot to determine whether the logs restored at reboot are complete.

System resets less severe than a reboot rarely affect the error and alarm logs.

NOTE:
If there are SYSTEM errors in the Error Log, use **display initcauses** to obtain additional information. Information that could not be logged during a system reset may be found here.

Defaults

All errors will be displayed.

Parameters

high-resolution	This option specifies that the error report should be displayed with high resolution time stamps for the first occurrence and last occurrence of the error. This high resolution time stamp includes seconds and a sequence count within a second. The sequence count starts over for each second.
print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Backward Paging of the Alarm/Error Log

G3V3 software allows the user to display the next and previous pages of the alarm/error log. When the user executes the **display alarm/error** command to view the alarm/error log. If more than one page of alarms/errors is stored by the system, the user may use the NEXT PAGE key or the PREV KEY key (513 or 715 terminals only use *F8* or *F7* for all other terminals) to toggle between pages (up to a maximum of two pages). If the system has storied one or less than one page of alarms/errors the command will display the alarms/errors and echo *Command successfully completed* and exit. Help messages/Key actions:

Next Page—The command will display the next page . If the user is not viewing the first page of alarms/errors, is not viewing a page as a result of depressing the PREV PAGE key, and there are more entries to display, the help message will be:

press CANCEL to abort, NEXT PAGE to complete, or PREV PAGE for previous page.

Prev Page—Press previous page key to return to the previous page. The system will display the help message:

press CANCEL to abort or NEXT PAGE for next page If the user is not viewing the first page of alarms/errors, is not currently viewing a page as a result of pressing the PREV PAGE key, and there are no remaining entries to display, the help message will be:

press CANCEL to abort, NEXT PAGE to complete, or PREV PAGE for previous page.

Help Messages

If the technician presses HELP after entering "display errors" the following message will be displayed:

```
['high-resolution'], ['print' or 'schedule']
```

Error Messages

If the the software data cannot be sent to the SAT, the following message will be displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

FORM INPUT

After entering the command "display errors," the system technician will be presented with an options form.

Error Type	The type of error to be displayed is specified by choosing an error type. This field defaults to display all errors.
Error List	The user may select which error list the error entries will be selected from by entering 'active-alarms', 'errors', or 'cleared-errors'. This field defaults to the 'active-alarms' error list. The error list selected will affect the Report Title on the output form.
Report Period	The technician can specify a starting and stopping time from which errors should be reported.
Interval	Display only error records for the last hour, last day, last week or all. The default is the last day.

From	Display only error records from the time specified by dd/hh/mm, where dd is the day, hh is the hour and mm is the minute. The default is the earliest time of the existing error records in the log.
To	Display only error records to the time specified by dd/hh/mm, where dd is the day, hh is the hour and mm is the minute. The default is the current time.
Equipment Type	The technician can choose between seven different equipment types: Cabinet: This allows the technician to display all errors associated with a particular cabinet. Errors for a cabinet are referenced by a number ranging from 1 to 3 which is assigned during cabinet administration. Port Network Number: This allows the technician to display all errors associated with a particular port network number. Errors for a port network are referenced by a number ranging from 1 to 3. Board Number: This allows the technician to choose all errors associated with a particular circuit pack for display. Errors for a circuit pack are referenced by circuit pack location (cabinet-carrier-slot). Port: This allows the technician to choose all errors associated with a particular port on a circuit pack for display. Errors for a port circuit are referenced by port location (cabinet-carrier-slot-circuit). Category: Errors for a particular equipment category. Extension: Errors associated with an extension number. Trunk (group/member): The technician can choose to view all errors associated with a particular trunk group or trunk group member. The group identifier should be entered to view all errors associated with a trunk group XXX/___. The group identifier and member identifier should both be entered to view all errors associated with a specific trunk group member XXX/XXX.

```
display errors                                                  Page   1 of   1
                                    ERROR REPORT
     The following options control which errors will be displayed.
         ERROR TYPES
            Error Type: _____         Error List: active-alarms
         REPORT PERIOD
            Interval: _      From: __/__/__:__ To: __/__/__:__
         EQUIPMENT TYPE ( Choose only one, if any, of the following )
                                Cabinet: __
                           Port Network: __
                           Board Number: ____
                                   Port: ______
                               Category: ________
                              Extension: _____
              Trunk ( group/member ): ___/___
```

Field Help

Following are the help messages that the system technician will see upon tabbing to the specified field and pressing the HELP key.

Error Type:	"Enter error type"
Error List:	The Error List field help provides the following help list: active-alarms, errors, cleared-errors.
Interval:	The interval field help provides the following help list: h(our), d(ay), w(eek), m(onth), a(ll).
From (month)	"Enter month between 1-12"
From (day)	"Enter day between 0-31"
From (hour)	"Enter hour between 0-23"
From (minute)	"Enter minute between 0-59"
To (month)	"Enter month between 1-12"
To (day)	"Enter day between 0-31"
To (hour)	"Enter hour between 0-23"
To (minute)	"Enter minute between 0-59"
Cabinet:	"Enter cabinet number (1-3)"
Port Network:	"Enter port network number (1-3)"

Board Number: "Enter 5 character board number; cabinet(1-3):carrier(A-E):slot(0-20)"

Port: "Enter port number; [cabinet(1-3)]:carrier(A-E):slot(0-20):circuit(01-31)"

Category: The category field help is a list of objects. This list includes the following: adm-conn, announce, bri/asai, cdr, data-mod, detector, dup-spe, environ, exp-intf, ext-dev, generatr, inads-link, infc, maint, mbus, memory, misc, mnt-test, modem, netcon, pkt, pkt-ctrl pms/jrnl, procr, quick-st s-syn, stabd, stacrk, stations, sys-prnt, tape, tdm, tone, trkbd, trkcrk, trunks. This list pertains only to help messages.

Category	Maintenance Objects
adm-conn	ADM-CONN
announce	ANN-PT, ANN-BD
bri/asai	BRI-BD, BRI-PORT, ABRI-PORT, BRI-SET, ASAI-ADJ
card-mem	CARD-MEM, 12V_PWR, CAP-MEM, FL-DATA
cdr	CDR-LNK
data-mod	PDMODULE, TDMODULE, DT-LN-BD, DAT-LINE, DDP-PDM, DDP-TDM, BRI-DAT
detector	DTMR-PT, GPTD-PT, DETR-BD, TONE-BD
dup-spe	DUPINT, SHDW-CIR, SHDW-LINK, SPE-SELEC, STBY-SPE, TAPE, PROCR, MEM-BD, SW-CTL, CARR-POW, PR-MAINT, PI-BD, DATA-CHL, DATA-CON, DATA-BD, PKT-CTRL, CAP-MEM, PI-PT
environ	POWER, AC-POWER, CARR-POW, EMG-XFER, CABINET, DC-POWER, EXT-DEV, RING-GEN
exp-intf	TDM-CLK, TONE-BD, TONE-BD, SYNC, EXP-INTF, EXP-INTF, EXP-LINK, CARR-POW, AC-POWER, DC-POWER, MAINT, DUPINT, EPN-SNTY
ext-dev	CUST-ALM, EXT-DEV
generatr	TONE-PT, TONE-BD, TONE-BD, TDM-CLK, SYNC, STRAT-3
inads-link	INADS
infc	PI-LINK, PI-SCI, PI-BD, PI-PT, EXP-INTF, EXP-INTF, EXP-LINK, ISDN-LNK, PKT-CTRL, IDSN-SGRP, PGATE-BD, X25-PT
maint	MAINT, PR_MAINT

Category	Maintenance Objects
mbus	PROCR, MEM_BD, PR_MAINT, TAPE, DATA-BD, SW-CTL, DUPINT, PI-BD, PKT-CTRL
memory	MEM_BD
misc	TIME-DAY, ERR-LOG, MIS, PROC-SAN, SYSTEM, CONFIG
mnt-test	M/T-DIG, M/T-PKT, M/T-BD
modem	MODEM-PT, MODEM-BD
netcon	SW-CTL, DATA-CHL, DATA-BD, DATA-CON
pkt	PKT-BUS, PKT-CTRL M/T-PKT
pkt-ctrl	PKT-CTRL
pms/jrnl	PMS-LINK, JRNL-LNK
procr	PROCR, PR_MAINT
quick-st	MO_AN_STA, MO_DIG_STA, MO_SCS_STA, MO_MET_STA, MO_PD_MODULE, MO_TD_MODULE, MO_51D_TRM, MO_DTDM, MO_DL_PT, MO_16_PT, MO_AN2_STA, MO_ANN_PT, MO_PDT_PT, MO_PDG_STA, MO_BRI_PT, MO_BRI_EPT, MO_BRI_VUSR, MO_BRI_DUSR, MO_ASAI, MO_DS_CO, MO_CO_TRK, MO_DS_DID, MO_DID_TRK, MO_DS_TIE, MO_TIE_TRK, MO_DSPRI_TRK, MO_DS_OPS, MO_ANNOUNCE, MO_SN_PT, MO_TDMCLK, MO_LPRI, MO_ABRI_PT, MO_ASAI_EPT, MO_ADX_PT, MO_X25_PT, MO_AUX_TRK, MO_TT_DET, MO_CPT_DET, MO_TGEN_BD, MO_PMOD, MO_CLAS_PT, MO_TGEN_BD, MO_LPMS, MO_LJOURNAL, MO_LCDR, MO_PMSPRNT, MO_JNLPRNT, MO_PRICDR, MO_SECCDR, MO_LSP, MO_EI_BD, MO_TDMBUS, MO_EPN_MB, MO_PACKET, MO_EPN_SANITY, MO_PROCESSOR, MO_MEMORY, MO_SYSAM, MO_ARCHA, MO_MSSNET, MO_TAPE, MO_DISK, MO_SYSTEM, MO_TTR_LEV, MO_SYS_CONFIG, MO_CTONE_BD, MO_PNI_BD, MO_PACCON, MO_EAA, MO_LINK
s-syn	S-SYN-PT, S-SYN-BD
stabd	ANL-LINE, ANL-NE-LINE, DIG-LINE, AUDIX-PT, DDP-D-PT, HYB-LINE, MET-LINE, ANL-16-LINE, BRI-PORT, ABRI-PORT, DDP-B-PT, DDP-A-PT, BRI-SET, ASAI-ADJ, DDP-BSET, DDP-ASAI, ANL-BD, ANL-BD, DIG-BD, AUDIX-BD, NMI-BD, HYB-BD, MET-BD, ANL-BD, BRI-BD
stacrk	ANL-LINE, ANL-NE-LINE, DIG-LINE, AUDIX-PT, DDP-D-PT, HYB-LINE, MET-LINE, ANL-16-LINE, OPS-LINE
stations	ANL-LINE, ANL-NE-LINE, DIG-LINE, AUDIX-PT, DDP-D-PT, HYB-LINE, MET-LINE, ANL-16-LINE, OPS-LINE, BRI-PORT, ABRI-PORT, DDP-B-PT, DDP-A-PT, BRI-SET, ASAI-ADJ, DDP-BSET, DDP-ASAI

Category	Maintenance Objects
sys-prnt	SYS-PRNT
tape	TAPE, TAPE-DATA, PR-MAINT
tdm	SW-CTL, TDM-BUS
tone	TONE-PT, TONE-BD, TDM-CLK, SYNC, STRAT-3, TONE-BD, DTMR-PT, GPTD-PT, DETR-BD, TTR-LEV, CLSFY-BD, CLSFY-PT
trkbd	CO-TRK, DID-TRK, AUX-TRK, TIE-TRK, TIE-DS1, CO-DS1, DID-DS1, ISDN-TRK, CO-BD, DID-BD, AUX-BD, TIE-BD, DS1-BD, DS1-BD, UDS1-BD
trkcrk	CO-TRK, DID-TRK, AUX-TRK, TIE-TRK, TIE-DS1, CO-DS1, DID-DS1, IDSN-TRK, ISDN-LNK
trunks	CO-TRK, DID-TRK, AUX-TRK, TIE-TRK, TIE-DS1, CO-DS1, DID-DS1, ISDN-TRK, ISDN-LNK, PE-BCHL, WAE-PORT
wide-band	PE-BCHL, WAE-PORT

Extension: "Enter assigned extension"

Trunk (group) "Enter group number between 1-99"

Trunk (member) "Enter group member between 1-99, or blank"

Field Error Messages

Following are the error messages that will be displayed on the screen. The messages are displayed when the system technician tabs out of a field and the validation routines are executed. In the following messages, an "x" or "xxxxxxxx" represents the characters that were entered by the user.

Interval: '"x" is an invalid entry; please press HELP key"

Error Type: 'Entry must be all digits"

From (month) 'Entry must be all digits"

From (day) 'Entry must be all digits"

From (hour) 'Entry must be all digits"

From (minute) 'Entry must be all digits"

To (month) 'Entry must be all digits"

To (day) 'Entry must be all digits"

To (hour) 'Entry must be all digits"

To (minute) 'Entry must be all digits"

Cabinet "Cabinet invalid"

Port Network Number:	"Port Network invalid"
Board Number:	"Board invalid"
Port:	"Port invalid"
Category:	""xxxxxxxx" is an invalid entry; please press HELP"
Extension:	"Entry must be all digits"
Trunk (group)	"Entry must be all digits"
Trunk (member)	"Entry must be all digits"

FORM OUTPUT

After valid options are entered by the technician, a hardware error report is displayed. The data displayed on this form will be:

Port	The location of the maintenance object. For installed circuit packs, the location is displayed as "cabinet-carrier-[slot]-[circuit]." For Port Network-related objects, the location is displayed as "PN xx," where "xx" is the Port Network number.
Maintenance Name	The logical name of the maintenance object which has had an error logged against it.
Alt Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xx when the object is a private CO line, where xx is the private CO line group number.
Error Type	A code identifying the type of problem encountered for this maintenance object. Because the error code is generally specific to the individual maintenance object and the total number of error codes may be extensive, only the error number is displayed. The technician must use this error number in conjunction with the logical name information to determine the exact nature of the error.
Aux Data	Additional information concerning the maintenance object error condition which may be useful to the technician. Like the error type, this data will be specific to the maintenance object type. However, unlike the error code, only the most recent value of the auxiliary data will be retained for each error record.

First Occur	The month, day, hour, and minute (and second if the high-resolution command line option is used) that the error was first recorded.
Seq Cnt	Sequence Count - This number indicates the order of errors logged within a second for the time stamps associated with the first occurrence and last occurrence of an error. This information is displayed only if the "high-resolution" command line option is entered. There may be gaps for the sequence numbers within a given second since the last occurrence of an error may replace an existing entry that had been assigned the missing sequence number, and since sequence counts are also used with software event information not shown in the hardware error log.
Last Occur	The month, day, hour, and minute (and second if the high-resolution command line option is used) of the most recent error. Note: if the system is unable to retrieve the time of day when the error occurred, a 'dummy' date will be stamped in the log so as to distinguish it from reliable data. It would appear as "00/00/01:07".
Err Cnt	Error Count - The total number of times that the error type has occurred for this maintenance object. Should this field exceed the display space allowed on the terminal screen (three characters), the numbers will be replaced by '256' This should inform the technician that a larger number was encountered, but could not be displayed correctly.
Err Rt	Error Rate - The average rate at which the errors have occurred from the first occurrence to the present. Should this field exceed the display space allowed on the terminal screen (three characters), the numbers will be replaced by '256' This should inform the technician that a larger number was encountered, but could not be displayed correctly.

Rt/Hr	Rate per Hour - An approximation of the rate that this error occurred in the last hour. Should this field exceed the display space allowed on the terminal screen (three characters), the numbers will be replaced by '256' This should inform the technician that a larger number was encountered, but could not be displayed correctly.
Al St	Alarm Status - A character indicating the status of this maintenance object in the error and alarm logs. The allowed values are: "n" for not alarmed, "a" for active alarm, "r" for a resolved alarm, "s" for "software restart requested" as a result of a software requested (non-demand) system restart, and "c" for a resolved alarm that was forcibly resolved via the "clear" option of the *test* command.
Ac	Active? - A flag indicating whether or not the maintenance object is still under active consideration by the maintenance subsystem. If set to 'no', maintenance no longer considers that this error report indicates a problem.

Example of the Hardware Error Log Display without the High-Resolution Command Line Option

For the following output example, the ENTER key was pressed immediately after entering the display errors command without the "high-resolution" command line option. Only those errors associated with alarms are displayed since the "Error List" field on the options form defaults to 'active_alarms'.

```
display errors                                                    Page  1   SPE A

                     HARDWARE ERROR REPORT - ACTIVE ALARMS

Port      Mtce     Alt      Err   Aux     First       Last      Err Err Rt/ Al Ac
          Name     Name     Type  Data    Occur       Occur     Cnt Rt  Hr  St
01C0702   ANL-LINE 311      257           01/31/09:20 01/31/20:26 255 256 255 a  y
01C0701   ANL-LINE 1051     257           01/31/20:26 01/31/20:26 4   0   4   a  y
01C0703   ANL-LINE 1053     257           01/31/20:26 01/31/20:26 4   0   4   a  y
01A       TDM-CLK           0     0       01/31/20:34 01/31/20:34 1   0   1   a  n
01C1505   CO-TRK   078/001 3329   57408 01/31/20:26 01/31/20:27 5   300 5   a  y
01C1505   CO-TRK   078/001 1537           01/31/20:26 01/31/20:28 5   150 5   a  y
02A0201   TONE-PT           0             01/31/20:34 01/31/20:34 1   0   1   a  y
PN 02B    TDM-BUS           18    0       01/31/14:53 01/31/21:12 1   0   1   a  n

Command successfully completed
```

Example of the Hardware Error Log Display with the High-Resolution Command Line Option

For the following output example, the ENTER key was pressed immediately after entering the display errors command with the "high-resolution" command line option. Only those errors associated with alarms are displayed since the "Error List" field on the options form defaults to 'active_alarms'.

```
display errors high-resolution                                  Page  1   SPE A

             HIGH RESOLUTION HARDWARE ERROR REPORT - ACTIVE ALARMS

Port     Mtce     Alt     Err   Aux         First   Seq       Last    Seq Err Al
         Name     Name    Type  Data        Occur   Cnt       Occur   Cnt Cnt St
01C0702  ANL-LINE 311     257         01/31/09:20:21 1  01/31/20:26:05 1  255 a
01C0701  ANL-LINE 1051     257         01/31/20:26:18 1  01/31/20:26:18 7  4   a
01C0703  ANL-LINE 1053     257         01/31/20:26:18 2  01/31/20:26:18 8  4   a
01A      TDM-CLK           0     0     01/31/20:34:35 1  01/31/20:34:35 1  1   a
01C1505  CO-TRK   078/001 3329  57408 01/31/20:26:07 1  01/31/20:27:28 1  5   a
01C1505  CO-TRK   078/001 1537         01/31/20:26:52 1  01/31/20:28:41 1  5   a
02A0201  TONE-PT           0           01/31/20:34:28 1  01/31/20:34:28 1  1   a
PN 02B   TDM-BUS           18    0     01/31/14:53:03 1  01/31/21:12:22 1  1   a

Command successfully completed
```

FEATURE INTERACTIONS

None.

display events

display events [print]

A vector event is the occurrence of something unexpected during a vector-routed call due to resource exhaustion or faulty vector programming. (For example, route-step failures are typically due to the programming of an invalid extension.) These types of failures are not due to faulty hardware or system software error and do not constitute incorrect feature operation. This command allows you to diagnose and correct vectoring problems due to the above-mentioned causes. See *DEFINITY Communications System Generic 3 Call Vectoring and Expert Agent Selection (EAS) Guide*, 555-230-520, for information on how to interpret this report.

Input Form

The following entry form is displayed to allow limiting the report to events of a certain type or from a certain time period. Enter the desired parameters and press ENTER.

Category	"Vector'' specifies the type of event report to display and is the only valid entry.
Report Period	The fields in this section allow you to view only those vector events that occurred within a specific time period. If these are left blank, all vector events recorded are displayed.
Interval:	This field specifies a display of all events within the last time period of the type Enter the first letter of one of the following selections: *a*ll, *m*onth, *d*ay, *h*our, *m*inute.
Start/Stop Time	The starting and ending times, in 24-hour notation, of the interval to be reported.
Vector Number	The number of the vector (1-256) for which events will be reported. If this field is left blank, events for all vectors will be reported.
Event Type	Specific types of vector events are associated with numbers from 50000 to 50999. Entering one of these numbers will limit the report to events of this type. If this field is left blank, events for all types of vectors will be reported.

Output

See *DEFINITY Communications System Generic 3 Call Vectoring and Expert Agent Selection (EAS) Guide*, 555-230-520, for more information on how to interpret this report. In particular, the Event Data 2 field will be associated with possible causes and repair strategies for the event.

Event Type	A number from 50000 to 50999 that identifies what type of vector event occurred.
Event Description	A text string describing the event.
Event Data 1	If in the format *number*/*number* such as ‘‘200/10’’, this indicates the vector number and step number associated with the event. If in the format “Split *number*’’ such as “Split 2’’, this indicates the split number.
Event Data 2	Additional data concerning the event encoded as a hex number.
First Occur	The date and time when the vector event first occurred.
Last Occur	The date and time when the vector event last occurred.
Evnt Cnt	The total number of times, up to 255, that vector events of this type have occurred.

The following example shows the input form for **display events**:

```
display events                                     Page  1 of  1   SPE B

                         EVENT REPORT

  The following options control which events will be displayed.

         EVENT CATEGORY

            Category: vector

         REPORT PERIOD

            Interval: _a_    From: __/__/__:__ To: __/__/__:__


         SEARCH OPTIONS

                           Vector Number: ___
                              Event Type: _____
```

The following example shows a typical vector event report.

```
display events                                   Page  1   SPE B


                       EVENTS REPORT

Event Event                  Event    Event   First     Last     Evnt
Type  Description            Data 1   Data 2  Occur     Occur     Cnt


50020 Call not queued        256/5     B   09/28/13:43 09/28/13:43  1
50541 Not a messaging split  Split 89  4C  09/28/13:43 09/28/13:43  1
```

display initcauses

This command records and displays a history of restarts performed by the system.

SYNOPSIS

display initcauses [print | schedule]

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

display initcauses
display initcauses print
display initcauses schedule

DESCRIPTION

The display initcauses command displays a history of recovery steps taken by the system. *This command displays information for restarts of the active processor only*. Every time the system performs some type of recovery (due to user request or a hardware or software problem), the recovery information is stored. The software error log also contains information pertaining to restarts. If a reset 4 (reboot) occurs, the software error log will also be stored on tape. Information in the software error log should be used in conjunction with information in the initcauses log.

The history of the last 16 restarts performed by the system will be recorded to the initcauses buffer in chronological order. This buffer will fill an entire screen with information if it is completely full. Power failures in the processor complex wipe out the entire initcauses buffer which is stored by the software. In duplex systems, both processors have to lose power before the information will be lost.

Defaults

No defaults.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "display initcauses" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Cause

The cause field indicates the reason for the restart. Some of the possible reasons for a restart follow:

- **Active Down:** (High or Critical Reliability System only) The Active SPE went into SPE Down mode. The Duplication Interface initiated an SPE-interchange to the Standby SPE. If this initcause triggers an SPE interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a Cold 2 restart to recover properly only minutes after the warm start has occurred.
- **Bad Handshake:** (High or Critical Reliability system only) The Duplication Interface received inconsistent handshakes from the Active SPE. Thus, the Duplication Interface initiated an SPE-interchange to the Standby SPE. If this initcause triggers an SPE interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a COLD 2 restart to recover properly only minutes after the warm start has occurred.
- **Bad Memory:** A defective memory circuit pack generating too many errors caused a restart.
- **System Technician Request:** The restart was performed because of system technician demand. A system technician-requested **reset system 4** command entry should always precede an **upgrade software** command entry.
- **Failed Interchange:** A "hot-start" interchange (system technician-demanded, scheduled, or software-requested) failed because shadowing was disabled.
- **From Monitor (mon):** (For Development Environment only)
- **Initialized:** This is always the first entry in the history and is present until more than 15 restarts have been performed. It indicates power-up and also occurs if the Maintenance/Tape Processor is reset during initialization.

- **LMM Request:** A sanity time-out was requested by the LMM firmware. The three processor circuit pack LEDs blink until the sanity timer goes off. The LMM requests a restart like this when it gets into trouble, usually with memory.
- **Maintenance Reset:** The Maintenance/Tape Processor or Duplication Interface reset the system. This refers to resets of the SPE by maintenance in SPE Down mode in which maintenance periodically tries to awaken the SPE.
- **No Handshake:** (High or Critical Reliability System only) The Duplication Interface lost handshaking with the active SPE. Thus, the Duplication Interface initiated an SPE-interchange to the Standby SPE. A defective tape drive may cause the Active SPE to miss handshakes with the Duplication Interface which, in turn, could result in an initialization cause of "No Handshake." Check the Hardware Error Log for TAPE-related error types and alarms and follow the recommended repair procedures in the TAPE Maintenance documentation. If this initcause triggers an SPE interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a Cold 2 restart to recover properly only minutes after the warm start has occurred.
- **Oryx Request:** A sanity time-out was requested by the Oryx operating system. The three processor circuit pack LEDs blink until the sanity timer goes off. Oryx requests a restart like this when it gets into trouble, usually with software or the 80286 processor.
- **Sanity Timer Reset:** The sanity timer on the processor timed out and reset the system. This event usually indicates a software fault.
- **Scheduled Interchange:** A scheduled SPE-interchange occurred.

- **Software Request:** Software requested the system restart. In a system equipped with High or Critical Reliability, software can also request SPE-interchanges when it detects problems. See the Software Requested Interchanges Caused by Alarm Conditions table (Table 8-1) in the "SPE-Interchanges" section of Chapter 8, "Reliability Systems: A Maintenance Aid". If this initcause triggers an SPE interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation.
- **SPE-Select Lead Change:** (High or Critical Reliability System only) The system could not determine why the SPE changed its status from Active or Standby. However, this change usually indicates a transition from Active to Standby. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a Cold 2 restart to recover properly only minutes after the warm start has occurred.
- **SPE-Select Switch:** (High or Critical Reliability System only) The SPE-Select switches on the Duplication Interface circuit packs were thrown to select the Standby SPE, which became the Active SPE, using the restart level shown. It is also possible to get an initialization cause of SPE-Select Switch when SPE B is active and power to carrier B is lost. In this case, an SPE switch to SPE A occurs and the initialization cause can show either SPE-Select Switch or SPE Down. If this initcause triggers an SPE-interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation.
- **Stby-SPE Core Dump:** (High or Critical Reliability System only) The Standby SPE had finished a core dump when an interchange took place that made the Standby SPE the Active SPE. If this initcause triggers an SPE-interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a Cold 2 restart to recover properly only minutes after the warm start has occurred.

- **Stby-SPE Tests:** (High or Critical Reliability System only) The Standby SPE was in the process of running tests at the request of the Active SPE when an interchange occurred. If this initcause triggers an SPE-interchange when the Standby is NOT in Maintenance mode, the previous entry in the log may actually represent a restart that occurred on the Standby SPE. See the preceding description of **display initcauses** for a complete explanation. If a High or Critical Reliability System does a PEI with a warm start, the system software often requests a Cold 2 restart to recover properly only minutes after the warm start has occurred.
- **Unknown:** A restart that could not be classified. The Software Error Log may contain more information about the restart.
- **Upgrade Software:** (High or Critical Reliability System only) This indicates that the system was upgraded to a new software generic using the Standby SPE to load the new software via the **upgrade software** command. A system technician-requested **reset system 4** command should be the previous entry.
- **LMM Put Fail:** This initcause occurs when the LMM has failed to place the request for initcause message in the DPR. This could occur if the MTP does not respond to the DPR handshake. Level of Restart: Warm (escalation turned on).
- **LMM Get Fail:** This initcause occurs when the LMM does not receive a response to the request for initcause message from the MTP. This could occur if the MTP is not taking messages out of the DPR. Level of Restart: Warm (escalation turned on).
- **Dupint Unknown:** This initcause occurs when the LMM receives an UNKNOWN initcause from the Dupint. This could occur in a High or Critical Reliability System where the MTP thinks a PEI has occurred but the dupint disagrees. Level of Restart: Warm (escalation turned on).
- **MTP Reset Unknown:** This initcause occurs when the LMM has reset the MTP during the process of trying to get initcause from the MTP. Level of Restart: Warm (escalation turned on).
- **S-vintage Mismatch:** This initcause occurs when a mismatch in the duplication super vintage is detected by the LMM. Level of Restart: Reboot (no escalation).

- **Monitor Reset:** (For Development Environment Only) This initcause occurs when "ini 1" is executed from the Flash Monitor. This initcause can occur only in systems with SBB. Level of Restart: Reboot (no escalation).
- **Bad GDT:** (For Development Environment Only) This initcause occurs when the LMM fails to transfer control to Oryx/Pecos because of absence of entry in GDT to point at O/P. This usually occurs in a system with no Idata. Again, this should only occur in systems with SBB.

Action — The level of recovery performed by the system. The recovery levels follow:

- Reset system 1 (Warm)
- Reset system 2 (Cold-2)
- Reset system 3 (Cold-1)
- Reset system 4 (Reboot)
- Reset system 5 (Extended Reboot)
- Reset system interchange (High or Critical Reliability System only - hot restart interchange)

Escalated — Whether the restart was escalated to a higher level to clear the problem. There is a software escalation strategy which can cause a higher level of restart than the one previously performed to be executed if the need arises.

Carrier — The "carrier" statement indicates the carrier on which the recovery was performed (possible values are **1A** and **1B**). In most cases, this "carrier" is the Active SPE carrier when the restart occurs. However, it is possible in a High or Critical Reliability System that this carrier was the Standby carrier. See the preceding description of **display initcauses** for a complete explanation.

Time — The date (month and day) and time of the restart.

For the following output example, the command display initcauses was entered.

```
display initcauses

                            INITIALIZATION CAUSES

     Cause                Action   Escalated    Carrier     Time
 Initialized                 4       no           1B       08/01  1:14
 System Technician Request   i       no           1A       08/01  2:14
 System Technician Request   i       no           1B       08/01  2:18
 Sanity Timer Reset          1       no           1B       08/02  6:03
 Sanity Timer Reset          1       no           1B       08/02  6:08
 Sanity Timer Reset          2       yes          1B       08/02  6:14
 Scheduled Interchange       i       no           1A       08/03  2:33
 Bad Handshake               1       no           1B       08/04  2:34
 Software Request            2       no           1B       08/05  8:22
 System Technician Request   1       no           1B       08/05  8:23
 System Technician Request   4       no           1A       08/05  9:15
 Upgrade Software            2       no           1A       08/05  9:29
 Software Request            i       no           1B       08/06  7:00
 System Technician Request   2       no           1B       08/06  7:09
 Software Request            1       no           1A       08/09  2:34
 No Handshake                1       no           1A       08/09  2:36


 Command successfully completed
```

FEATURE INTERACTIONS

None.

display memory-configuration

This command displays the active and standby processor Flash Read-Only Memory and Dynamic Random Access Memory configurations.

SYNOPSIS

display memory-configuration [long]

PERMISSIONS

The following default logins may execute this command: browse, system technician, cust, inads, init.

EXAMPLES

display memory-configuration
display memory-configuration long

DESCRIPTION

The maintenance command, display memory-configuration, will indicate the total memory available for the active, and if present the standby, processor(s). This command is a single page display with hidden fields for the standby-processor; these hidden fields will only be visible if a standby processor is available in the system.

Defaults

No defaults.

Parameters

long	The “long” command parameter is required to display the standby SPE Flash ROM and DRAM configuration.
print	If specified, this parameter will cause the information displayed by this command to be sent to the printer attached to the terminal as well as to the screen.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen.

Help Messages

If the system technician presses help after entering "display memory-configuration" the following message will be displayed:

```
Enter [‘long’] [‘print’ or ‘schedule’]
```

Error Messages

If “display memory-configuration” is executed on G3V5r systems, the following error message will appear on the SAT status line:

```
“memory-configuration” is an invalid entry; please press HELP
```

If ““display memory-configuration long” is executed on a simplex system, the following error message will appear on the SAT status line:

```
”long” is an invalid identifier; please press HELP
```

If “display memory-configuration long” is executed when the standby processor is not available, the following message will appear on the SAT status line:

```
Cannot access the standby SPE at this time
```

OUTPUT

M bytes: .

SP_A:

SP_B:

Flash ROM:

Total DRAM

SIMM A:

SIMM B

SIMM C:

For the following output example the command "display memory long" was entered.

```
display memory-configuration long                                    SP_A
                      PROCESSOR MEMORY-CONFIGURATION
                                 (M bytes)



                                SPE_A   SPE_B

               Flash ROM:        16      16

              Total DRAM:        12      12

                  SIMM A:         4       4
                  SIMM B:         4       4
                  SIMM C:         4       4






Command successfully completed

Command:

Command:
```

For the following output example the command "display memory" was entered.

```
display memory-configuration                                           SP_A
                      PROCESSOR MEMORY-CONFIGURATION
                                 (M bytes)



                                SPE_A   SPE_B

               Flash ROM:        16

              Total DRAM:        12

                  SIMM A:         4
                  SIMM B:         4
                  SIMM C:         4






Command successfully completed

Command:

Command:
```

FEATURE INTERACTIONS

None

display port

This command displays information for a specified port.

SYNOPSIS

display port location [print **|** schedule]

PERMISSIONS

The following default logins may execute this command: browse, system technician, cust, inads, init.

EXAMPLES

display port 1c0801
display port 1c0802 print
display port 2c1504 schedule

DESCRIPTION

The display port command displays the port location, the equipment connected to the port, and the means by which the port can be identified (e.g. an extension number, the trunk group and member, etc.).

Defaults

No defaults.

Parameters

llocation	the location represents the physical position of the port to be displayed and is entered as "UUcSSpp" where "UU" represents the cabinet number (1-3), "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit. A single digit cabinet (1 - 9) may be entered with or without a leading zero (0).
print	If specified, this parameter will cause the information displayed by this command to be sent to the printer attached to the terminal as well as to the screen.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses help after entering "display port" the following message will be displayed:

```
Enter assigned port, [’print’ or ’schedule’]
```

Error Messages

If the format for the port location is incorrect, the following message is displayed:

```
Identifier invalid
```

If the port location is not administered, the following message is displayed:

```
Identifier not assigned
```

If the specified port location is out of range, the following message is displayed:

```
Port/Board location invalid
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

OUTPUT

Port:	The port address (cabinet-carrier-slot-circuit) of the specified user specified port.
Equipment Type:	The hardware that is physically connected to the user specified port.
Identification:	This depends on the hardware that is physically connected to the port. If a station is connected to the port the station extension is displayed, if a trunk is connected to the port a trunk group and member is displayed, If a modem pool is connected to the port, the modem pool group is displayed, etc.

For the following output example the command "display port 1c0801" was entered.

```
display port 1c0801                            SPE A

                      PORT INFORMATION

                        Port: 01C0801
              Equipment Type: Station
              Identification: 1021
```

FEATURE INTERACTIONS

None

display synchronization

This command displays the system synchronization administration such as stratum level (3,4), primary and secondary synchronization reference sources and DS1 boards.

SYNOPSIS

display synchronization [print | schedule]

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

display synchronization
display synchronization print
display synchronization schedule

DESCRIPTION

The display synchronization command will bring up the synchronization form. The administered synchronization stratum and reference sources will be displayed on this form. This command does not allow for any changes to be made to the system synchronization.

Defaults

No defaults.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen.

Help Messages

If the system technician presses HELP after entering "display time" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Stratum:	This field specifies the synchronization stratum that is used. The only possible entries are "3" and "4."
Primary:	This field designate the first choice system synchronization source. A blank entry means no synchronization. This field is valid only if stratum 4 synchronization is specified.
Secondary:	This field designate the second choice system synchronization source. A blank entry means no synchronization. This field is valid only if stratum 4 synchronization is specified.
Location:	The circuit pack location (cabinet-carrier-slot) of all administered DS1 circuit packs are listed here.
Name:	If a user defined name is administered for the DS1 circuit pack, it will be displayed here. Blank means no user defined name was given to this DS1 circuit pack.
Slip:	If the DS1 circuit pack has slip alarm, this field will show 'y'. Otherwise it will show 'n'.
Port Network:	This field is only valid for stratum 3 synchronization. The field specifies the port network that supplies synchronization via the tone clock circuit pack.

For the following output example, the command display synchronization was entered.

```
display synchronization                       Page  1 of  2

       SYNCHRONIZATION SOURCE (DS1 circuit pack location)

           Stratum: 4
           Primary:      Secondary:

                        DS1 CIRCUIT PACKS

 Location    Name     Slip        Location    Name     Slip
 02B10 D92D1 ds1 2b10   n
 02B11 d92D1 ds1 2b11   n
 01C10 D92D1 ds1 1c10   n
 01C11 D92D1 ds1 1c11   n

 NOTE: TN722B DS1 sources result in stratum 4, type II synchronization
```

```
display synchronization                       Page  2 of  2

                       SYNCHRONIZATION PLAN
                        DS1 CIRCUIT PACKS

 Location  Name    Slip        Location  Name    Slip
```

FEATURE INTERACTIONS

A DS1 interface or a UDS1 board that has been selected as either a primary or secondary synchronization source cannot be removed on the DS1 circuit pack administration form or the regular circuit pack administration form.

display system-parameters maintenance

This command displays existing maintenance-related system parameters.

SYNOPSIS

display system-parameters maintenance [high-resolution] [print | schedule]

PERMISSIONS

Logins with the following service levels may execute this command: craft, inads, init, super-user, or logins with Maintain Switch Circuit Packs permissions enabled.

EXAMPLES

display system-parameters maintenance
display system-parameters maintenance print
display system-parameters maintenance schedule

DESCRIPTION

The "display system-parameters maintenance" command displays the translation data for maintenance related system parameters.

Parameters

Print	This option will cause the report to be printed if a printer is linked to the SAT.
Schedule	When the schedule option is specified, the command is validated and a schedule form is displayed to allow the technician to schedule execution of the command at a specified time. The information displayed by the command will be sent to the system printer instead of the screen.

For more information see "Command Groups" at the beginning of this chapter.

Help Messages

The following help message will be displayed when the system technician presses the help key after entering the "**display system-parameters maintenance**" command:

```
['Print' or 'schedule']
```

Output

An input form is displayed with the following fields. Defaults for data entry fields are listed in parentheses.

Product Identification	This is a 10-digit number starting with 1 that identifies the switch to an Operations Support System (OSS), for example, INADS.
First OSS Telephone Number	The first telephone number that the switch uses to report alarms to, for example, INADS or Trouble Tracker. The number must be obtained from the National Customer Support Center (NCSC) or the TSC. **#** and ***** are not allowed in the telephone number.
Abbrev Alarm Report	Enables the Abbreviated Alarm Report feature for the first OSS. (yes)
Second OSS Telephone Number	The second telephone number that the switch uses to report alarms to, for example, INADS or Definity SNMP. The number must be obtained from the National Customer Support Center (NCSC) or the TSC. **#** and ***** are not allowed in the telephone number.
Abbrev Alarm Report	Enables the Abbreviated Alarm Report feature for the second OSS. (no)

Alarm Origination to OSS Numbers	Indicates one of four options for alarm origination (neither): ■ If "both," all Major and Minor alarms result in an automatic call to both OSS telephone numbers. Both OSS telephone numbers must be administered. ■ If "first-only," all Major and Minor alarms result in an automatic call to the first OSS number only. The switch does not call the second OSS telephone number even if the number is administered. The first OSS telephone number must be administered ■ If "neither," alarm origination does not take place. Warning alarms are not reported to either numbers. ■ If "second-as-backup," all Major and Minor alarms result in an automatic call to the first OSS telephone number. If calling the first OSS telephone number fails four attempts, the switch starts to call the second OSS telephone number as a backup until calling the first OSS telephone number becomes successful. Both OSS telephone numbers must be administered.
Cleared Alarm Notification	Enables the switch to originate a call to the OSS and send an alarm resolution message whenever all previously reported Major and Minor alarms are resolved. Alarm Origination must be activated in order for Cleared Alarm Notification to work. (no)
Restart Notification	Enables the switch to originate a call to the OSS and report any system restarts caused by problems with the switch.
Test Remote Access Port	Specifies whether testing of the remote access port on the SYSAM circuit pack is enabled. This field should be set to "yes" whenever there is an INADS line connected to the switch and there is a maintenance contract in effect so that alarm origination capability is maintained.

CPE Alarm Activation Level	Indicates the minimum level (Major, Minor or Warning) at which the Customer-Provided Equipment (CPE) alarm is activated. If the level is "none," the CPE does is not activated for any alarm. (none) **NOTE:** The CPE alarm is always activated when the switch goes into Emergency Transfer, regardless of the CPE Alarm Activation Level setting.
Packet Bus Activated	Enables the system Packet Bus. If this field is set to ‘‘yes'', then maintenance software assumes that there is a Packet Control circuit pack installed in the system. The packet endpoints (for example, ASAI, and/or BRI) may be administered, and maintenance testing runs on both the Packet Control circuit pack and on the Packet Bus (This field should be set to “yes” after a packet control circuit pack is installed.). If a Packet Control circuit pack is not installed in the system, then a major alarm is raised against the PKT-CTRL MO. This field can only be changed from ‘‘yes'' to ‘‘no'' if there are no packet endpoints administered, thus ensuring that there can be no packet endpoints administered if the packet bus is not activated. This field should be set to “yes” after a Packet Control circuit pack is installed. If a Packet Control circuit pack is not installed, then this field should be set to ‘‘no'' (the only exception is when setting up translations for a system for which not all of the required hardware is available). (no)
Customer Access to INADS Port	Provides the capability to prohibit access to system administration and maintenance interface, via the INADS port when using customer login ID’s. This field can only be activated by Lucent services through system-parameters maintenance administration.(no)
Repeat Dial Interval (MMS)	Indicates the number of minutes that the system must wait before attempting another call origination to an OSS. This timer is triggered by the lack of a far-end acknowledgment. (7)

Scheduled Maintenance

A series of maintenance tests and operations runs automatically every day according to the schedule and settings specified in the following fields.

Start Time	The hour and minute in 24-hour notation at which daily scheduled maintenance will begin running. (22:00)
Stop Time	The hour and minute when scheduled daily maintenance will stop running. If any daily maintenance operations are not completed by this time, the system will note where in the sequence it stopped and perform those operations during the next scheduled daily maintenance.
Daily Maintenance	This display-only field simply represents the series of tests that are always run by maintenance software as part of daily maintenance.
Save Translation	This field indicates on which days translation data in memory will automatically be saved to the Mass Storage System disk and/or tape devices during scheduled maintenance. The save operation is first made to disk, followed by a disk backup to tape. On systems with duplicated SPEs, translation data is saved on both SPEs. Valid entries are **daily**, days of the week, or **no**. "No" specifies that no automatic saves are to be executed. (daily)
Control Channel Interchange	Each port network has a pair of TDM busses called A and B, each of which has a set of time slots dedicated to use by the control channel. At any one time, the control channel in each PN is carried on only one of the two busses. This field indicates on which days the control channel in each port network will be switched from one of the paired TDM busses to the other. Valid entries are **daily**, days of the week, or **no**. "No" specifies that no interchange be executed. (no)
System Clocks Interchange	On High and Critical Reliability systems, this option causes a Tone-Clock interchange in each port network with duplicated Tone-Clock circuit packs. Each port network interchanges into the standby Tone-Clock for 20 seconds and then back to the Tone-Clock that was originally active. This field indicates on which days the interchanges are to take place. Valid entries are **daily**, days of the week, or **no**. "No" specifies that interchanges be executed. (no)

SPE Interchange	On systems with duplicated SPEs, this field indicates on which days an SPE interchange will be executed during scheduled maintenance. Valid entries are **daily**, days of the week, or **no**. "No" specifies no scheduled interchanges. (no)
EXP-LINK Interchange	This field indicates whether or not the expansion links between port-networks are interchanged as part of scheduled maintenance. The value ‘‘daily'' means that EXP-LINK interchange occurs automatically everyday. The value ‘‘no'' means that EXP-LINK interchange is not done automatically as part of scheduled maintenance. Values represented by the days of the week mean that EXP-LINK interchange occurs automatically on the specified day only. Since EXP-LINK interchange only applies to duplicated systems, simplex systems do not display this field. (no)
Minimum Threshold for TTRs	When the number of touch tone receivers (TTRs) in service falls below this number (4 to 200), a WARNING alarm is raised against TTR-LEV (see "TTR-LEV (TTR Level)" in Chapter 11, "Maintenance Object Repair Procedures"). These are also known as dual-tone multifrequency receivers (DTMRs). There are 4 TTRs on each TN748 Tone Detector circuit pack, and up to 50 TN748s in a system. To alarm the first occurrence of a TTR being taken out of service, set this field to 4 times the number of TN748s. If this number is set to more than three less than the total number of TTRs, a port network with only one TN748 could lose all of its TTRs before this alarm is raised.
Minimum Threshold for CPTRs	When the number of call progress tone receivers in service falls below this number (2 to 100), a WARNING alarm is raised against TTR-LEV (see "TTR-LEV (TTR Level)" in Chapter 11, "Maintenance Object Repair Procedures"). These are also known as general purpose tone detectors (GPTDs). There are 2 CPTRs on each TN748 Tone Detector circuit pack, and up to 50 TN748s in a system. To alarm the first occurrence of a CPTR being taken out of service, set this field to 2 times the number of TN748s. If this number is set to more than one less than the total number of TTRs, a port network with only one TN748 could lose all of its CPTRs before this alarm is raised.

Minimum Threshold for Call Classifier Ports	When the number of call classifier ports (CLSFY-PTs) in service falls below this number, a WARNING alarm is raised against TTR-LEV (see "TTR-LEV (TTR Level)" in Chapter 11, "Maintenance Object Repair Procedures"). Valid entries are 1 to 200. There are 8 ports on each TN744 Call Classifier circuit pack, and up to 25 TN744s in a system. To alarm the first occurrence of a CLSFY-PT being taken out of service, set this field to 8 times the number of TN744s. If this number is set to more than 7 less than the total number of CSLFY-PTs in the system, a port network with only one TN744 could lose all of its CLSFY-PTS before the alarm is raised. If there are no TN744s in the system, leave this field blank.
Test Type 100, Test Type 102, Test Type 105	An extension assigned to receive tie-trunk calls from other switches with test line origination capability. The system responds by sending a sequence of test tones. Test Type 100 tests far-end to near-end loss and C-message by sending: ■ 5.5 seconds of 1004 Hz tone at 0dB ■ Quiet until disconnect; disconnect is forced after one minute
ISDN-PRI Test Call Extension	The extension used by a far-end ISDN node to place a call to the system to test the ISDN-PRI trunks between the far-end and the system.

ISDN-BRI Service SPID	This field shows whether or not the link is associated with the Service SPID. If the link is associated with the Service SPID, this field contains a "yes" and the extension field is blank; otherwise, this field is blank. Service SPID is a feature used by the system technician to check building wiring between the switch and the BRI endpoint.

DSO Loop-Around Test Call Extension	This field contains the extension number for the test call extension number. This test extension number will be used to establish a loop-around connection on the selected trunk.

The DSO Loop-Around Test Call feature is used primarily for testing DSO channels associated with non-ISDN-PRI trunks. The loop-around is activated by dialing the test extension number. Multiple DSO Loop-Around connections can be set up by placing multiple calls to the loop-around extension.

The DS0 Loop Around feature provides a loop around connection for incoming non-ISDN DS1 trunk data calls. This feature is similar to the far-end loop around connection provided for the ISDN Test Call feature. This DS0 loop around is provided primarily to allow a network service provider to perform facility testing at the DS0 level before video teleconferencing terminals are installed at the PBX.

The feature is activated on a call-by-call basis by dialing a test call extension specified on the second page of the System Parameters Maintenance form. No special hardware is required. When the test call extension is received by the PBX, a non-inverting, 64 kbps connection is set up on the PBX's Time Division Multiplexed bus. More than one loop around call can be active at the same time.

For calls routed over the public network using the ACCUNET Switched Digital Service (SDS) or Software Defined Data Network (SDDN), the data transmission rate is 56 Kbps, since robbed bit signaling is used. For calls established over a private network using common channel signaling, the full 64 kbps data rate is available.

When the incoming trunk group is used only for data calls (SDS), the Communications Type on the associated Trunk Group form should be set to "data." When the incoming trunk group is used for robbed bit alternate voice and/or data (SDN/SDDN), the Communications Type on the Trunk Group form should be set to "rbavd" (robbed bit alternate voice data). For private network trunks using common channel signaling, the Communications Type on the associated Trunk Group form can be set to "avd."

Loss Plan

Use only when extra loss is required to maintain quality of transmission on conference calls. Leave this field blank if no extra loss is required. If extra loss is required, enter digits as shown below.

No. Of Parties To Be Conferenced	Enter Digit
3	2
4	3
5	4
6	5
7	6

SPE Optional Boards:

These fields indicate whether a Disk circuit pack is present in the system, and which Packet Interface slots are administered. If a Packet Interface circuit pack is physically present, the corresponding Packet Interface field is set to y when the system boots, and no change to that field is allowed. If the system is equipped with duplicated SPEs, a Packet Interface field is set to y when either SPE carrier contains a Packet Interface circuit pack in the corresponding position. If a Packet Interface circuit pack is not present, then the value for the Packet Interface field is read from translation data stored on disk or tape. If the field is set to n, a Packet Interface circuit pack may be administered by changing the corresponding Packet Interface field to y.

Modem Connection

On page 3 of the example forms shown below, there are 11 fields that are hidden when the “Modem Connection?” field is set to internal. In this example the “Modem Connection” field is set to “external” and these additional 11 fields are visible.

The first 2 fields on page 3 help setup the data format for the serial data from the switch to the modem. The field names are, “Data Bits:”, and “Parity?”. There are only two valid combinations for these 2 fields:

- Data Bits = 8, Parity = None
- Data Bits = 7, Parity =(odd , even, mark, or space)

The remaining fields are listed below:

Modem Connection	The only valid entries for this field are “internal” or “external”. The default is set to internal. (internal)
Modem Name	This field is 20 characters long and will permit alpha-numeric characters to provide a unique qualifier for a given modem. The field is called “Modem Name: ”. ( )
RTS/CTS Enabled	This field will inform the modem that communication with the data source UART will be driven with RTS/CTS flow control. This field is 6 characters long with a default of “\Q3”. This field is case in-sensitive; however, the default will be in upper case. (\Q3)
Asynchronous Data Mode	This field will configure the modem as an asynchronous communications device. This field is 8 characters long with a default of “&M0&Q0”. This field is case in-sensitive; however, the default will be in upper case. (&M0&Q0)
DTE Auto-Data Speed	This option will adjust the speed of the data source (DTE) UART to the outgoing (modem-to-modem) data rate. So, at maximum this speed would be 9600 baud. This field is 6 characters long with a blank as default . This field is case in-sensitive. ( )
Disable Data Compression	This field will turn off the default data compression algorithms that are in use by most consumer modems. This field is 6 characters long with blank as the default. The AT commands that control this capability are supported by similar commands; however, these commands do not operate in the same manner. The Intel modems require the use of “H%C0” to disable V.42bis & MNP Class 5 data compression algorithms; however, the Paradyne products only use “%C0” to disable both algorithms. This field is case in-sensitive; with blank as the default. ( )

Enable Error Control	This field will turn on the V.42 LAPM and MNP error control protocols, if available on the modem. This field is 6 characters long with blank as the default. This V.42/MNP/Buffer mode first attempts to negotiate V.42 error control with the remote modem. If this fails, then the modem transitions to MNP, and if this fails then no error control is used. This field is case in-sensitive. ( )
Misc. Init. Param	This field is 20 characters long with blank as the default. This field supports any initialization parameters that are not already specified. The AT commands specified in this free-form field will be always the last initialization parameters to be sent to the external modem. This field is case in-sensitive; however, the default will be in upper case. ( )
Auto-Answer Ring Count	This field controls the number of rings required before the modem will automatically answer an incoming call. This field is 6 characters long with “S0=10” as the default. Typically, the maximum permissible value for this register is 255. The values 1-255 denote the number of incoming ring cycles. This field is case in-sensitive; however, the default will be in upper case. (S0=10)
Dial Type	This field controls the type of inter-register signaling to be used between the modem and the Central Office. The field name is “Dial Type: ” with a default of “T” for tone dialing. Pulse dialing is indicated by “P”. The field length should be 3 characters long. This field will be concatenated with the dial string. This field will be case in-sensitive; however, the default will be in upper case. (T)

Adjustable Make/Break Ratio	This field can be of particular importance when using a modem that may be transferable from country to country. The intent of this field is to control the make/break ratios of pulses and DTMF dialing. The Intel product information has support for the different make/break options for pulse dialing only. Intel uses the option “&P0” to select a ratio of 39% make and 61% break for communication within the U.S. and Canada. The option “&P1” sets a ration of 33% make and 67% break for the U.K. and Hong Kong. This field is 5 characters long with blank as the default. This field will be case in-sensitive. ( )
Dial Command	This field is 3 characters long with “D” as the default.. This field simply denotes the dialing command of the modem. This is a fairly standard command. This field will be case in-sensitive; however, the default will be in upper case. (D)
No Answer Time-Out	Most off-the-shelf external modems provide a timer that abandons any outbound data call after a predetermined interval. Some modems provide for this timer to be disabled, thus allowing an outbound call to ring indefinitely. AT&T Paradyne does not provide this capability with their modem line, because it is generally undesirable to have an outbound call attempt ring indefinitely. The internal modem must have this parameter disabled or set to at least 255 seconds. This is a non-administrable parameter. For the external modem connection, this parameter will be the first initialization string to be transmitted to the external modem. This field will be visible on the administration form in display mode only. This hardcoded constant can be overriden for type approval applications, specifically in the U.K and other Western European nations, by the use of the “Misc. Init. Param:” field. (S7=255)

The following display shows a typical result when **display system-parameters maintenance** is entered.

```
display system-parameters maintenance                           Page   1 of 3
                   MAINTENANCE-RELATED SYSTEM PARAMETERS

OPERATIONS SUPPORT PARAMETERS
            Product Identification: 1000000000
        First OSS Telephone Number: 5551212          Abbrev Alarm Report? y
       Second OSS Telephone Number: 5551213          Abbrev Alarm Report? n
  Alarm Origination to OSS Numbers: both
        Cleared Alarm Notification? y
              Restart Notification? y
           Test Remote Access Port? n
        CPE Alarm Activation Level: none
              Packet Bus Activated? n
     Customer Access to INADS Port? n
       Repeat Dial Interval (mins): 7

SCHEDULED MAINTENANCE
                  Start Time: 22: 00                  Stop Time: 04: 00
           Daily Maintenance: daily            Save Translation: daily
 Control Channel Interchange: no       System Clocks Interchange: no
             SPE Interchange: no            EXP-LINK Interchange: no
```

```
   display system-parameters maintenance           Page 2 of 3

           MAINTENANCE-RELATED SYSTEM PARAMETERS

 MAINTENANCE THRESHOLDS ( Before Notification )
   Minimum Threshold for TTRs: 4_    Minimum Threshold for CPTRs: 1_
   Minimum Threshold for Call Classifier Ports: _

 TERMINATING TRUNK TRANSMISSION TEST (Extension)
   Test Type 100:        Test Type 102:         Test Type 105:

 ISDN MAINTENANCE
    ISDN-PRI TEST CALL Extension: _____    ISDN BRI Service SPID: _____

 DS1 MAINTENANCE
    DSO Loop-Around Test Call Extension: 1001

 LOSS PLAN (Leave Blank if no Extra Loss is Required)
    Minimum Number of Parties in a Conference Before Adding Extra Loss: _____

 SPE OPTIONAL BOARDS
  Disk? y   Packet Intf1? y   Packet Intf2? n     Packet Intf3? n
```

```
   change system-parameters maintenance           Page 3 of 3

           MAINTENANCE-RELATED SYSTEM PARAMETERS

        Modem Connection: external
               Data Bits: 8
                  Parity: none

             Modem Name: intel

          RTS/CTS Enabled: \Q3       Auto Answer Ring Count (rings): S0=10
  Asynchronous Data Mode: &M0&Q0                         Dial Type: T
     DTE Auto-Data Speed: \J1         Adjustable Make/Break Ratio: &P0
Disable Data Compression: H0%C0                       Dial Command: D
    Enable Error Control: \N3                  No Answer Time-out: S7=255
       Misc. Init. Param: ____________________



Help/Error Message Line
Command Line
```

display time

This command displays the system time.

SYNOPSIS

display time *[print | schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse.

EXAMPLES

display time
display time print
display time schedule

DESCRIPTION

The display time command will bring up the time form. The system time will be displayed on this form. This command does not allow for any changes to be made to the system time.

Defaults

No defaults.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [2] for more details.

Help Messages

If the system technician presses HELP after entering "display time" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Day of the Week	The day of the week that the system has stored.
Day of the Month	The numerical day of the month.
Month	The month of the year stored by the system.
Year	The current year stored by the system.
Hour	The hour of the current day.
Minute	The number of minutes into the hour.
Second	The number of seconds into the minute stored by the system.

For the following output example, the command display time was entered.

```
display time

                     DATE AND TIME

    DATE
       Day of the Week:  Sunday       Month: January
       Day of the Month: 1            Year:  1990

    TIME
                   Hour: 6          Second: 20
                 Minute: 8
```

FEATURE INTERACTIONS

The date and time are generally used by the switch.

download update-file

This command provides a mechanism for downloading a field update file from INADS or a personal computer using the XMODEM protocol.

SYNOPSIS

download update-file

PERMISSIONS

The following default logins may execute this command: inads and init.

EXAMPLES

download update-file

DESCRIPTION

The update file is transferred to the switch asynchronously from either an INADS host or a personnel computer (PC) using the XMODEM protocol. The switch is called asynchronously (either using the "call" command from an INADS host, or by dialing the switch directly with a modem. Once the connection has been established, the user logs into the switch as a remote system access terminal (SAT), using the inads login.

Only the INADS and INIT logins have the necessary permission to send an update file to the switch.

The command "download update-file" is entered at the SAT to initiate the download of the update file and, when this command is entered, the switch will respond with "Please wait ...". After some initialization at the switch has completed, the command displays: "Please start file transmission now...". At this point, an XMODEM session should be started up on the remote end and the update file should be sent. If an INADS host is being used, enter ~dload <file_ name> to start the file transmission. If a PC is being used, follow the instructions in the emulator's manual for invoking an XMODEM session to send the update file.

As each block is received by the switch, it is written to tape or flash. Error detection and retransmission are provided by the link level of XMODEM. Additional protection is provided within the application level. After the entire file has been written to tape or flash it is read back and each update file block is validated. The file checksum is also checked. If the file appears to be sound, the status word in the header block is then changed to indicate that there is a valid update file. At this point, for 286 systems only, any immediate sub-patches will be applied. Immediate subpatches are not supported for 386 systems.

There may be a delay (of up to 5 minutes on a duplex system) between the end of the file transmission and command completion. This delay is caused by the patch application of any immediate sub-patches and, if on a duplex system, the automatic copy of the update file to the standby SPE which take place as a result of the reception of a valid update file.

In a High or Critical Reliability System, the connection to the INADS host computer may be dropped (by the INADS side) but the process of copying the patch file to the standby processor continues. The standby is placed in maintenance mode and a call placed between active and standby via the data channels. The file is transmitted in the same way for both tape and flash based systems. The same checks are made on the receiving side as were made during and after the original download. If no errors are found, the file is marked valid.

There is no feedback to the user on the status of the standby copy. If an error is encountered during the copy or validation process on the standby, an error is logged in the software error log. The data consistency audit will discover that the two patch files are inconsistent and the user must manually copy the valid file on the active processor to the standby processor.

The software does not indicate when the copy has completed, so scripts run by the TSC must not issue an immediate reset on High or Critical Reliability Systems. This will interrupt the copy and guarantee that the field update files on the two processors are inconsistent. This problem can be avoided by using one of the following techniques:

- Use two scripts: the first to apply the patch and a second, to be run later, to issue the reset that applies the patch. This requires two calls to each duplicated switch.
- Put a delay into the scripts which causes the scripts to wait a period of time after downloading the file and before issuing the reset. This requires only one call, but the amount of delay time required is not well defined as it depends on system load.
- Use a manual means of detecting when the copy has completed: either a "PASS" on the data consistency audit or a match on the *"list configuration software"* form. This requires only one call and introduces less delay in requesting the reset.

Help Messages

There is no associated help message as the command has no options.

Error Messages

If the vintage of the standby SPE doesn't match the vintage of the active SPE, the following message is displayed:

286

```
Update file vintage does not match standby SPE core vintage on tape
```

386

```
Update file vintage does not match standby SPE core vintage
```

If the patch identifier in the update file does not match the patch identifier in memory, the following message is displayed:

386

```
Update file patch identifier does not match SPE patch identifier
```

If an update file which is created for a different system (i.e.,. a patch file is created for a tape system and downloaded to a flash system), the following message is displayed:

286 and 386

```
Update file designed for a different configuration, file will not be used
```

If the update file is too large to fit in the remaining space, the following message is displayed:

286 and 386

```
Update file is too large to fit on device
```

If the calculated file checksum is incorrect, the following message will be displayed:

286

```
File checksum failed; file on tape will not be used
```

386

```
File checksum failed; file will not be used
```

If an invalid update file block was found, the following message will be displayed:

286

```
Found a bad file block; file on tape will not be used
```

386

```
Found a bad file block; file will not be used
```

If the total number of blocks listed in the header block of the update file did not match the number of blocks received by the SPE, the following message is displayed:

286 and 386

```
Received an invalid number of blocks; file will be ignored
```

The total number of subpatches listed in the header of the update file did not match the number of subpatches received by the switch

286 and 386

```
Received wrong number of subpatches for update file
```

286

Tape cartridge removed or failure to access tape

```
Tape access failure; no tape cartridge or device failure on standby SPE
```

Tape cartridge write protected

286

```
Tape write failure;tape cartridge or device failure on standby SPE
```

Read failures occurring while accessing tape. The tape may be worn or defective.

286

```
Tape read failure;tape cartridge or device failure on standby SPE
```

OUTPUT

None

FEATURE INTERACTIONS

386

The form displayed for the list configuration software-vintage command has been modified to reflect the changes imposed by the flash architecture. The form is basically the same as for the tape based Intel system, but does not include fields such as "Tape Resident Vintage" which don't apply to 386 systems. It is these differences in the "list configuration software" command that should allow INADS to determine, with one query, the hardware configuration, software vintage and patch identifier.

There is no interaction with routine periodic or scheduled maintenance because patches are only applied on restarts before the system is in normal operation.

The flash checksum test acts as a backup check to make sure the entire field update file was applied correctly. It can fail because of a bad checksum update from a poorly constructed update file or because the patching operation has aborted. When the flash Checksum Test fails, a MAJOR on-board alarm is raised on the processor/memory circuit pack. Maintenance runs a data consistency test on a daily basis to check that copies of translations, announcements and software files are consistent across both processors in a High or Critical Reliability System. If the test detects a difference, a minor, off-board alarm is generated.

When checking the software, the test compares the memory resident software version and patch identifier. It also checks for the presence of a field update file and, if found, compares the old and new patch identifiers to make sure the same patch file id loaded on each processor. If the software or update files are inconsistent, the "list configuration software" command can be used to display the status of the patch file.

286

The form displayed for the list configuration software-vintage is basically the same as that for the flash based Intel system, but includes the "Tape Resident" fields instead of the "Memory Card Resident" and "Flash Resident" fields which don't apply to tape based intel systems. The "list configuration software" command allows INADS to determine, with one query, the hardware configuration, software vintage and patch identifier.

RECOVERY PROCEDURES

This sections describes the procedures to be followed to recover from failures encountered during the download and application of the update file. The instructions apply to both simplex and duplex switches; additional detail is given when needed.

Error on the Transmission of the Download

If the error displayed on the terminal indicates that the download step in the process failed, there are several culprits:

1. The transmission line could have been noisy. Retry after making all the following checks. Failed attempts take up room in the hard patch file and may require a warm start to clear the file.
2. The user may have downloaded the tape/MIPS version of the patch instead of the flash version.
3. The vintage of the update file may not match the vintage of software currently running in the system. Check the customer's vintage using "list config software" and patch vintage provided in the documentation.
4. The switch may have had difficulty in writing to the hard patch file. Check the hardware error log for processor/memory board failures.
5. The hard patch file may be full. Issue a "reset system 1". This should cause valid files to be applied and invalid ones to be erased.

Error on Application of the Patch

A patch may not have been applied for the following reasons:

1. The memory card was write-protected. Remove this protection and issue a "reset system X."
2. The patch identifiers were inconsistent. Run "list configuration software" and compare the old_patch identifier with the values in the update file.
3. The LMM encountered a problem with the patch file. This is unlikely because the same checks, and more, were performed when the file was downloaded, prior to marking the file valid. This implies that the memory which stored the update file was corrupted. Apply the back out file immediately to back out the changes. Run the flash checksum test to make sure the system is back to its prepatch state. Check the validity of the file again with the development community and then try redownloading and applying the patch immediately.
4. The LMM reports a hard error. The symptoms of this is an entry in the hardware error log for the processor/memory board, if you're lucky, or extremely odd switch behavior followed by SPE down mode if you're not. The problem is that the LMM couldn't complete the programming of memory with the result that memory is in a corrupted state. The only recovery is to visit the site armed with new software and processor/ memory circuit packs.

   In a High or Critical Reliability System, the failure causes a switch to the standby processor. The hardware on the standby must be repaired and the patch redownloaded. (There was nothing wrong with the patch)

Good Application - Bad Patch

This error is caused, not by a failure in the download or application, but by a fault in the patch file itself. To recover from this type of problem, the back out file which backs out the patch should be downloaded and applied. Clearly, this requires that the system be sane enough to receive the file correctly and be able to apply it.

In a High or Critical Reliability System, the user has about eight minutes to recognize that a problem exists and force an interchange to the standby processor. If this can be done, the file on the newly active processor can be invalidated using a file containing a destroy tuple or the *wp byte* command. The standby can be restored to a normal state using the back out file.

Inconsistent Software Versions on a Duplicated Switch

Inconsistent software, as indicated by a failure in the data consistency test, can be caused by problems copying the update file to the standby or validation test failures on the standby. Unlike the tape or MIPS systems which revert to the same version of software as a result of a refresh, a flash system remains inconsistent until manually initiated steps are taken. Use the *list config software* command to determine the status of the vintages, patch identifiers and patch file data on both the active and standby processor.

1. If one processor looks as if it has been patched (updated patch identifier and no update file) and the other looks as if the patch file is still present (no patch identifier and valid update file), the application of the patch can be forced by making that processor active and requesting the system restart indicated in the accompanying documentation.

2. If one processor has a copy of the update file and the other doesn't (neither has been patched), the file can be copied using the command *copy update-file*.

3. If patch identifiers disagree but neither side has a valid update file, the missing patch should be redownloaded to the system. During the download process the file will pass the vintage test and be copied to the standby processor. Validation tests will then be run on both machines. On the next restart, the patch will be applied to memory. This procedure is less disruptive to the customer if the unpatched processor is the standby at the time of the restart.

enable administered-connection

This command restarts scheduled and periodic maintenance for a single administered connection or all administered connections.

SYNOPSIS

enable administered-connection [ac number | all]

PERMISSIONS

The following default logins may execute this command: inads, init, system technician, cust, rcust, mis.

EXAMPLES

enable administered-connection all
enable administered-connection 1
enable administered-connection 128

DESCRIPTION

The enable administered connection command causes scheduled and periodic maintenance to function normally for all or single administered connection(s). This command can be used to track the maintenance processing of administered connections without interference from other maintenance processing. This commands restarts the processing of in-line errors for all or the selected administered connection.

Defaults

None.

Parameters

ac number	The number of the administered connection being enabled.
all	IF "all" is entered then all administered connections are enabled.

Help Messages

If the user presses HELP after entering "enable administered-connection", the following message will be displayed:

```
Enter assigned administered connection number(1-128) or 'all'
```

Error Messages

If the administered connection number entered is not "all" and is non numeric, the following message is displayed:

```
Identifier invalid
```

If the administered connection number entered is not within the valid range of connections, the following message is displayed:

```
Entry out of range
```

If the connection number entered is not administered, the following message is displayed:

```
Identifier not assigned
```

If the administered connection number entered is already enabled, the following message is displayed:

```
Administered connection already enabled
```

If the software data cannot be sent to the SAT, the following message will be displayed:

```
Error encountered, can't complete request
```

If the command entered is in conflict with another currently executing command, then a message is displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear and then resubmit
```

OUTPUT

After the user has entered the command and the command is successful, the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

enable mst

This command will allow the user to enable the trace buffer.

SYNOPSIS

enable mst

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

enable mst

DESCRIPTION

The enable mst command will enable the message trace. The trace will then be controlled according to the parameters on the "change mst" screen. If executed while the trace is enabled, it will have no effect and will indicate that it worked.

Defaults

None.

Parameters

None.

Help Messages

If the user presses HELP after entering "enable mst", the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

After the user has entered the command the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

enable synchronization-switch

This command re-enables automatic clock switching.

SYNOPSIS

enable synchronization-switch

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

enable synchronization-switch

DESCRIPTION

The enable synchronization-switch command puts the automatic clock switching capability of the maintenance subsystem back into a normal state. Clock refers to the oscillator on a tone/clock or DS1 interface.

The synchronization subsystem provides error free digital communication between the switch and other PBXs, COs, or customer premise equipment. The subsystem is made up of system components involved in synchronization: TDM bus clock, DS1 trunk board, maintenance and administration software resident in the SPE.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses help after entering "enable synchronization-switch" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the enable synchronization-switch command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the enable synchronization-switch command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, can't complete request
```

If the enable command is run and synchronization-switch is currently enabled, the following message will be displayed on the SAT:

```
Synchronization-switch already enabled
```

FEATURE INTERACTIONS

None.

enable test-number

This command enables a previously disabled test number.

SYNOPSIS

enable test-number number

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

enable test-number 102

DESCRIPTION

This command will re-enable the specified test number that was previously disabled. This will cause that the test number be allowed to run on the next request by maintenance or the technician.

Defaults

No defaults.

Parameters

number	This is the specific test number to re-enable.

Help Messages

If the system technician presses help after entering "enable test-number" the following message will be displayed:

```
Enter test number
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy
```

OUTPUT

If the enable test-number command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the enable test-number command is unsuccessful, the following message will be displayed on the SAT:

```
Error encountered, cannot complete request
```

FEATURE INTERACTIONS

The display disabled-tests command gives a list of all disabled tests.

format card-mem

This command formats the active processor Flash Read-Only Memory.

SYNOPSIS

format card-mem [translation] [announcements] [coredump] [firmware]

PERMISSIONS

The following default logins may execute this command: browse, system technician, cust, inads, init.

EXAMPLES

format card-mem translation
format card-mem announcements
format card-mem coredump
format card-mem firmware

DESCRIPTION

The maintenance command, “format card-mem” will erase and format the memory card for translations announcements, coredump, and firmware.

Defaults

No defaults.

Parameters

translation	If specified, this parameter will erase and format the memory card for translations only.
announcemen ts	If specified, this parameter erase and format the memory card for translations and announcements.
coredump	If specified, this parameter will erase and format the memory card for translations, announcements and coredump
firmware	If specified, this parameter erase and format the memory card for translations, announcements and firmware

Help Messages

If the system technician presses help after entering "format card-mem" the following message will be displayed:

```
Enter ‘translation’ or ‘announcements’ or ‘coredump’ or ‘firmware’
    ‘translation’ option formats for translation only
  ‘announcements’ option formats for translation and announcements
       ‘coredump’ option formats for translation, announcements, and code-dump
       ‘firmware’ option formats for translation, announcements, and firmware
Or press CANCEL to cancel the command
```

Error Messages

If the format memory [translation] [announcements] [coredump] [firmware] maintenance command is executed and errors occur, one of the following error messages will be displayed:

- `Memory card is not inserted in the system`
- `Cannot turn on 12 volt power supply`
- `Memory card is write-protected`
- `Unknown type of memory card`
- `Could not write to memory card`
- `Could not erase memory card`
- `Memory card too large for operation requested`
- `Memory card too small for operation requested`
- `Error encountered, memory card unusable`

OUTPUT

For the following output example the command "format card-mem" was entered.

```
                          FORMAT FLASH MEMORY CARD

Processor  Command Completion Status

  SPE-A    SUCCESS











------------------------------------------------------------------------------
Command successfully completed
------------------------------------------------------------------------------
Command: format card-mem translation
```

FEATURE INTERACTIONS

None

get vector

This command displays the conditions and the Switch Processing Element (SPE) associated with a core dump of memory to tape or memory card.

SYNOPSIS

get vector *long print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

get vector
get vector print
get vector long
get vector long print

DESCRIPTION

The get vector command displays the vector and the Switch Processing Element (SPE) used for a core dump of memory to tape or memory card. The dump occurs on the tape or disk of the previously active SPE (or the SPE previously specified using the "set vector" command in systems with duplicated SPEs).

The vector is cleared when a system restart of the proper level is performed regardless of whether the core is actually dumped.

Defaults

No defaults.

Parameters

long	This causes timestamps for the core dump to be printed. If SPEs are duplicated, timestamps are printed for both SPEs (or a message stating why the timestamp cannot be printed is displayed).
print	This causes the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses help after entering "get vector" the following message will be displayed:

```
['long'], ['print']
```

Error Messages

If a list configuration command is still executing while the "get vector" command is entered, the following message will be displayed:

```
Still clearing previously canceled command; please try later
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Core Dump Vector	The condition(s) which cause(s) a core dump to a tape drive or memory card are represented by a hexadecimal value. The hexadecimal value is a bit map of the four reset conditions which cause the dump. These conditions from least to most significant bit are: warm start, cold 2 restart, cold 1 restart, and reboot. A core dump vector of 0 signifies that the vector is cleared or not set.

Vector-Condition Mapping

value	warm-start	cold-2	cold-1	reboot
0	n	n	n	n
1	y	n	n	n
2	n	y	n	n
3	y	y	n	n
4	n	n	y	n
5	y	n	y	n
6	n	y	y	n
7	y	y	y	n
8	n	n	n	y
9	y	n	n	y
a	n	y	n	y
b	y	y	n	y
c	n	n	y	y
d	y	n	y	y
e	n	y	y	y
f	y	y	y	y

Set Vector Command Option	The user specified SPE prior to the core dump. For simplex SPE systems this field will always be "spe-active" unless the vector is cleared or not set. For duplex SPE systems the field will be either "spe-active" or "spe-standby" unless the vector is cleared or not set. If the vector is cleared or not set in either a duplex or simplex SPE system, this field will display blanks.
Core Dump Time	The time that the core dump was taken. This field displays timestamps for both "SPE_A" and "SPE_B." If the system has a simplex SPE, a timestamp will be displayed for "SPE_A" (or the active SPE) and "non duplicated SPE" will be displayed for "SPE_B." If the core dump cannot be accessed a message of "can't access" will be displayed for the corresponding SPE (e.g. in a High or Critical Reliability System where SPE B is not refreshed, "SPE_B" displays "can't access" instead of a timestamp). If the MSS device storing the core dump timestamp is busy for any reason a "device busy" message is displayed.

For the following output example, the command get vector was entered on a duplex SPE system after a core dump occurred when the vector bit was set. Assume SPE B was the active processor prior to the core dump, but SPE A is the current active processor.

```
get vector

                          GET RESULTS

   Core Dump Vector           Set Vector Command Option
       0                      spe-active

   Core Dump Time
   SPE_A
   SPE_B

 Command successfully completed
```

FEATURE INTERACTIONS

None.

list configuration

list configuration hardware-group [print | schedule]

NOTE:
The **list configuration software-version** command is discussed separately under its own heading.

Hardware configuration reports list, for each circuit pack in the group specified, the type, code, suffix, and vintage of the requested circuit packs as installed in the switch, and all ports assigned to the circuit pack.

Parameters

Enter one of the following hardware groups.

- **carriers all**— Specifies the display of all circuit packs administered and/or physically inserted in port, switch node and control carriers on the entire system.
- **board** *UUCSS*— Specifies the display of all assigned ports on the circuit pack specified by cabinet, carrier and slot.
- **carrier** *c*— Specifies the display of all circuit packs and assigned ports on a specified carrier.
- **control**— Specifies the display of all circuit packs located in the control complex.
- **ds1**— Specifies the display of all the DS1 (TN722, TN767 and TN464) circuit packs administered and/or physically inserted in port carriers on the entire system.
- **port-network pn#**— Specifies the display of all circuit packs located in a specified port network. **List cabinet** gives the port network number(s) associated with a particular cabinet. Circuit packs on switch node carriers are not displayed when the port-network qualifier is entered. To display SN circuit packs, use the **all**, **carrier** or **board** qualifiers.
- **stations**—Specifies the display of all circuit packs that can be assigned stations (including DS1 circuit packs for remote stations). All assigned ports are displayed.
- **trunks**—Specifies the display of all circuit packs that can be used for administering trunks. All assigned ports are displayed.

Examples

list configuration carrier 2c schedule
list configuration port-network 5
list configuration stations print

Output

Assigned Ports:

- **Board Number**— The functional name of the circuit pack.
- **Code**— The TN or UN code and suffix of the circuit packs are displayed.
- **Vintage 00000000-065535 KKKKKK**— The vintage number of the circuit pack.
- **no board**— The circuit pack is administered but not physically installed.
- **conflict**— The circuit pack administered to the slot differs from the circuit pack that is physically installed.
- **no link**— The T1 link is down to a DS1 circuit pack.

Field definitions:

- **Signaling**—This field is displayed only when "list configuration ds1" option is selected. The contents of the field are the same as the signaling mode administered for the ds1 circuit pack (via add/change ds1 command) or "none" if the circuit pack is not administered.
- **Name**— This field is displayed only when "list configuration ds1" option is selected. The contents of the field are the same as the name administered for the ds1 circuit pack (via add/change ds1 command) or "blank" if the circuit pack is not administered.
- **CSU MOD**— This field is displayed only when "list configuration ds1" option is selected. The field contains the identification number of the Integrated CSU module present on the ds1 circuit pack (TN767E or later / TN464F or later) or "none". If the circuit pack is a TN464E or TN767D, "unknown" will be displayed. If the circuit pack is a TN464D or TN767C or earlier suffix DS1 board, then "n/a" will be displayed.

Assigned Ports

Each port on the circuit pack is represented by a position corresponding to its circuit number in ascending order from left to right. The assigned ports are not displayed for "list configuration ds1". Two rows are required for circuit packs with more then 8 ports. The position displays one of the following values depending on its administered status:

- **01-16**— The circuit number of an assigned port.
- **u**— The port corresponding to this position exists but is unassigned.
- **t**— The port is not currently assigned and is supported by the Terminal Translation Initialization feature. Ports in this state can be activated by the TTI association sequence.

Each port on a TN556 ISDN-BRI circuit pack can have two BRI endpoints. BRI ports are displayed once when assigned only one endpoint and twice when fully configured with two endpoints.

The following display shows a typical result when **list configuration all** is entered.

```
   list configuration all                                       Page   1

                            SYSTEM CONFIGURATION

Board                                                         Assigned Ports
Number   Board Type              Code     Vintage    u=unassigned t=tti

01C00    MAINTENANCE/TEST        TN771C    000003     u  02 03 04
01C01    AUXILIARY TRUNK         TN748C    conflict   u  u  u  u
01C02    EXPANSION INTRFC                  no board
01C03    PGATE BOARD             TN577     000003     u  u  u  u
01C05    TONE DETECTOR           TN748B    000002     01 02 03 u  05 06 07
01C06    DS1 INTERFACE           TN767     000011     u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u
01C07    ANALOG LINE             TN742     000010     u  u  u  u  u  u  u
01C08    HYBRID LINE             TN762B    000004     u  u  u  u  u  u  u
01C09    ANALOG LINE             TN742     000010     u  u  u  u  u  u  u
01C11    DIGITAL LINE            TN754     000004     u  u  u  u  u  u  u
01C12    DID TRUNK               TN753     000006     u  u  u  u  u  u  u
01C13    ANALOG LINE             TN742     000010     u  u  u  u  u  u  u

  press CANCEL to quit --  press NEXT PAGE to continue
```

The following display shows a typical result when **list configuration ds1** is entered.

```
list configuration ds1

                    SYSTEM CONFIGURATION - DS1 Circuit Packs

Location   Code    Vintage    Signaling        Name            CSU MOD

01B05      TN464F  000002     isdn-pri                         120A1
01B06      TN464D  000002     isdn-pri                         n/a
01B10      TN767C  000003     none                             n/a
01B11      TN767E  000003     robbed-bit                       120A1
01B12      TN767E  conflict   none                             <blank>
01C06              no board   none                             <blank>
01C13      TN464E  000003     common-channel                   unknown
01C16      TN767D  000024     robbed-bit                       unkonwn
01C18      TN464F  000002     isdn-pri                         none
```

list config software-version

list configuration software-version [memory-resident | long]
[print | schedule]

This command displays

- Software version numbers and compatibility indexes of the software load modules stored in system memory (RAM) and on the Mass Storage System devices (tape).
- The dates and times when translation and announcement data were last saved to the MSS.
- Information about any software update files that have been applied to the system. See "Software Upgrade" in Chapter 5, 'Routine Maintenance Procedures" for an explanation of software versions and compatibility indexes.

Parameters

long	Specifies display of data for both SPEs in a high or critical reliability If not used, only data for the active SPE is shown.
memory-resident	Specifies display of RAM-resident files only. Fields for tape data will contain `n/a`

Output

If the tape or memory card contains a core dump file, fields for tape or memory card data display `coredump`. When a core dump is present, all other files on the device are marked invalid.

If the tape or memory card cannot be read at the time the command is entered, the relevant fields display `no tape or memory card`. (This does not indicate that the system does not recognize the presence of the device.)

Fields in the SPE-B column are blank for standard reliability systems. On high and critical reliability systems, only fields for the active SPE are displayed unless the **long** option is specified.

Tape Second Copy Fields (286 only)

Many of the files on tape are duplicated: a second copy of the file is stored on the same device. The Second Copy fields indicate whether the two copies are consistent using the following entries:

Good	The second copy is considered usable. The time stamp and/or vintage of the second copy matches the first, and its status bits mark it as a good file.
Inconsistent	The time stamp or vintage of the file is inconsistent with the first copy, or the status bits mark it as a bad file. Follow normal escalation procedures.
Inaccessible	The second copy of the file could not be accessed. Media failure is the most probable cause for this. Follow normal escalation procedures.

UPDATE FILE Section

The top half of page 1 of the form displays information pertaining to software field-update files (‘‘patches’’).

Creation (GMT) Tape and (GMT) Disk	When the update file was originally created, in Greenwich Mean Time (GMT). Note that this is *not* the time at which the update file was written to the MSS device.
Old-Version Tape and Disk	The software version for which the update was created.
Old-Identifier Tape and Disk	Which previous update file this update file expected to find stored in the MSS when it was applied.
New-Identifier Tape and Disk	Uniquely identifies the current update file.

SOFTWARE VERSION Section

This section at the bottom of page 1 of the output form displays information related to the current software-load module stored in memory and in the MSS.

Memory Resident	Version number of the RAM-resident load module.
Tape Resident (286 only)	Version number of the tape-resident load module.

Mem Card Resident (386 only)	Version of memory card resident load module. If a memory card is not installed, this field will display “no card”.
Update-identifier (Patch Identifier)	This uniquely identifies the update file, if any, that has been applied to memory.
Update-state (Patch State)	The status of the software field-update (‘‘patch’’) file id is displayed.

TRANSLATION DATE Section

This section displays information related to the translation files as stored in memory and the MSS.

Memory Resident	Date and time marked on the tape or disk when translation data was last read from the MSS into memory. This is stored in SPE memory and is not modified by changes to translation data. A save translation will update this date. If "Date invalid" is displayed, the timestamp does not contain the expected information.
Tape Resident (286 only)	The last date and time that translation data was saved to tape. This date is read from tape and appears blank if the tape is not installed.
Mem Card Resident (386 only)	The last date and time that translation data was saved to the memory card. This date is read from the memory card at command execution. If a memory card is not installed, this field will display “no card”.

PI FW VERSION Section

This section displays information related to the Processor Interface (PI) circuit pack firmware. Information is displayed for the PI circuit pack resident copy as well as the corresponding tape file..

PI 1 Resident	The version of firmware in the first PI circuit pack in the control carrier.
PI 2 Resident	The version of firmware in the second PI circuit pack in the control carrier.
Tape Resident (286 only)	The version of PI firmware residing on the tape. This field is left blank if there is no tape in the tape drive.
Flash Resident (386 only)	The version of PI firmware residing on the system flash memory.

ANNOUNCEMENT DATE Section

This section displays information related to the announcement files. Information is displayed for the memory resident copy as well as the corresponding MSS file.

Tape Resident (286 only)	The last date and time that announcement data was saved to tape. This date is read from the tape at command execution.
Mem Card Resident (386 only)	The last date and time that announcement data was saved to the memory card. If the memory card is not installed, this field will display "no card"..

PKT-CTRL FW VERSION Section

This section displays information related to the Packet Control firmware. Information is displayed for the Packet Control circuit pack resident copy as well as the corresponding tape file..

Pkt-ctrl Resident	The version of firmware in the Packet Control circuit pack.
Tape Resident (286 only)	The version of the Packet Control circuit pack residing on the tape. This field is left blank if there is no tape in the tape drive.
Flash Resident (386 only)	The version of the Packet Control circuit pack residing on the system flash memory.

Some things to note when using the **list configuration software-version** command are:

1. For simplex systems, the fields under column "SPE_B are always blank and the optional **Long** qualifier is not part of the command line.
2. For a High or Critical Reliability System, the fields under the column of the standby SPE are blank if the optional **long** modifier is not given.
3. If the tape or memory card contains a core dump file system, fields for the tape or memory card will contain ***coredump***. This is because in a coredump file system all files other than the ***coredump*** file are marked as invalid.
4. If for any reason, MSS can not be read when the command is issued the string **no tape** or **none** for no memory card will be placed in the appropriate fields on the screen. This does not mean that the system thinks there is no tape, only that the software was unable to read the appropriate information when requested.
5. If the command is issued using the ***memory-resident*** option, the fields on the form associated with the tape will contain the string **n/a**.

6. When the status of the update field is displayed, the following strings will be used (For more information refer to step 3 of this list):

none in memory	No update has been applied to memory.
immediate partially applied	An error condition that is valid only when an update that is in the process of being applied fails. Check the validity of the update file that was sent, and then check the hardware error log for tape errors, and follow standard maintenance procedures.
all immediate applied deferred pending	A valid update file was received by the switch, and all the immediate sub-patches were applied. This state indicates that there are deferred sub-patches in the update file, and a system reset of the proper level has not occurred since the update file was received.
deferred partially applied	An error condition that is valid only when a update that is in the process of being applied fails. Check the validity of the update file that was sent, and then check the hardware error log for tape errors, and follow standard maintenance procedures.
entirely applied to memory	The update associated with the memory-resident identifier has been completely applied to memory.

The following display shows a typical result when **list configuration software-version** is entered on a 386 system.

```
list configuration software-version             Page   1

                           SOFTWARE VERSIONS
                     SPE-A                  SPE-B
         UPDATE FILE
Creation (GMT) Date: none
   Old Version Tape: none
Old Identifier Tape: none
New Identifier Tape: none
       Update State: none in memory

    SOFTWARE VERSION
    Memory Resident: G3V4i.03.0.049.0
  Mem Card Resident: none
  Update Identifier: none

    TRANSLATION DATE
    Memory Resident:  1:00 am MON FEB 26, 1992
  Mem Card Resident:  1:00 am MON FEB 26, 1992


          press CANCEL to quit --  press NEXT PAGE to continue
```

```
list configuration software-version            Page   2

                           SOFTWARE VERSIONS
                    SPE-A                       SPE-B
       PI FW VERSION
      PI 1 Resident: 000162
      PI 2 Resident: none
     Flash Resident: 000162



    ANNOUNCEMENT DATE
   Mem Card Resident: none

    PKT-CTRL FW VERSION
   Pkt-Ctrl Resident: 000021
      Flash Resident: 000021
```

```
list configuration software-version                          Page   1

                               SOFTWARE VERSIONS
                      SPE-A                           SPE-B
          UPDATE FILE
 Creation (GMT) Date: 4:17 pm FRI NOV 3,1995      4:17 pm FRI NOV 3, 1995
    Old Version Tape: G3V4i.03.0.044.0            G3V4i .03.0.044.0
 Old Identifier Tape: none                        none
 New Identifier Tape: 000010                      000010
        Update State: new update ready to be      entirely applied
                      applied                     to memory

     SOFTWARE VERSION
     Memory Resident: G3V4i.03.0.044.0            G3V4i .03.0.044.0
   Mem Card Resident: none                        none
   Update Identifier: none                        000010

     TRANSLATION DATE
     Memory Resident:  1:01 pm THU NOV 2, 1995
   Mem Card Resident:  1:01 pm THU NOV 2, 1995
list config log applied patch to standby

           press CANCEL to quit --  press NEXT PAGE to continue
```

```
list configuration software-version                          Page   2

                              SOFTWARE VERSIONS
                      SPE-A                         SPE-B
      PI FW VERSION                       PI FW VERSION
     PI 1 Resident: 000162               PI 1 Resident: 000162
     PI 2 Resident: none                 PI 2 Resident: none
    Flash Resident: 000162              Flash Resident: 000162

     PI 1 Resident: 000162               PI 1 Resident: 000162
     PI 2 Resident: none                 PI 2 Resident: none
    Flash Resident: 000162              Flash Resident: 000162




    ANNOUNCEMENT DATE                    ANNOUNCEMENT DATE
   Mem Card Resident: none              Mem Card Resident: none

    PKT-CTRL FW VERSION                  PKT-CTRL FW VERSION
   Pkt-Ctrl Resident: 000021            Pkt-Ctrl Resident: 000021
      Flash Resident: 000021               Flash Resident: 000021
```

list disabled-mos

```
                              SOFTWARE VERSIONS
                    SPE-A                          SPE-B
COMPATIBILITY INDEX
   Memory Resident: 8.3
     Tape Resident: 8.3
     Disk Resident: 8.3
```

This command displays all the MOs that have been maintenance disabled in the system.

SYNOPSIS

list disabled-MOs [print **|** schedule]

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

list disabled-MOs
list disabled-MOs print
list disabled-MOs schedule

DESCRIPTION

This command will display a list of the specific MOs that have been disabled with the disable MO, disable MO-all, or disable all commands.

Defaults

No defaults.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses help after entering "list disabled-MOs" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy, try again later
```

OUTPUT

Maintenance Name	The type of maintenance object or group of maintenance objects that have been disabled. "ALL" is also valid.
Location	The physical location of the maintenance object that has been disabled. This field displays blanks if all maintenance objects have been disabled (disable all) or all MOs of a specific type have been disabled (disable MO-all).
Status	Whether the maintenance object or group of maintenance objects is "Enabled" or "Disabled."

```
list disabled-MOs

          DISABLED MAINTENANCE OBJECT INFORMATION

        Maintenance Name   Location    Status
        ALL                            Enabled
        DIG-LINE           02A1203     Disabled


 Command successfully completed
```

FEATURE INTERACTIONS

None.

list history

This command generates a log listing of the most recent "data affecting" administration and maintenance commands.

SYNOPSIS

list history [print | schedule]

PERMISSIONS

The following logins may execute this command: browse, system technician, cust, inads, init, nms.

EXAMPLES

list history
list history print
list history schedule

DESCRIPTION

The list history command generates a log listing of the most recent "data affecting" administration and maintenance commands successfully completed.

Data commands are those administration and maintenance commands that change the data state associated with any object and qualifier in the system. Administration data commands affect translation data while maintenance data commands affect state information. For example, "change station" would be classed as a data command, whereas "display station" would not.

All information in the transaction log is saved on tape as translation data when the "save translation" command is performed (LIFO order). When the switch COLD I starts or reboots, the saved translation, and thus the transaction log, will be loaded from tape. In this way, the translation data and the data in the transaction log will remain compatible.

Defaults

None.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [2] for more details.

Help Messages

If the system technician presses HELP after entering "list history", the following message is displayed:

```
['print' or 'schedule']
```

Error Messages

None.

OUTPUT

Date	The date the command was issued. Format "mm/dd" where "mm" is the month and "dd" is the day.
Time	The time the command was issued. Format "hh:mm" where "hh" is the hour and "mm" is the minute.
Port	The port field indicates the port type to which the user was connected when the command was issued.

Port Number	Board	List History Display
0 - 30	EPN Maintenance Board Port	MAINT
31 - 40	System Access Port	SYS-PORT
41	Maintenance Board Port	SYSAM-LCL
42	Remote Maintenance Board Port	SYSAM-RMT

Login	The login of the user performing the data command; for example "system technician."
Actn	The first word (verb) of the command, specifying the operation to be performed. This field is truncated after four characters to allow enough space for objects and qualifiers. Four characters is enough to uniquely identify each action.
Object	The second phrase of the command specifying the particular thing being acted upon by the command. Note: Where the object is multiple words in length, only the first word will be displayed in the object field. All succeeding words will be treated as qualifiers. This field is truncated after twelve characters to allow enough space for qualifiers. Twelve characters is enough to uniquely identify each object.
Qualifier	One or more qualifiers which specify the characteristics of the action/object pair. This field is truncated after 31 characters to keep information for a command on a single line.

For the following example, the command that was entered is "list history."

```
list history                          Page   1   SPE A

                               HISTORY

       Date of Loaded Translation: 11:34am Mon Apr 20, 1992

  Date  Time Port      Login   Actn  Object     Qualifier
  4/20 17:23 SYSAM-LCL init    go    tcm
  4/20 11:34 SYSAM-LCL init    cha   trunk-group  100
  4/20 11:25 SYSAM-LCL init    add   trunk-group  100
  4/20 11:25 SYSAM-LCL init    cha   circuit-pack 9
  4/20 11:25 SYSAM-LCL init    add   cabinet      9
  4/18 17:59 SYSAM-LCL init    clea  mst
  4/18 17:59 SYSAM-LCL init    test  board        2e01
  4/18 17:58 SYSAM-LCL init    clea  mst
  4/18 17:58 SYSAM-LCL init    enab  mst
  4/18 17:58 SYSAM-LCL init    cha   mst
  4/18 17:58 SYSAM-LCL init    disa  mst
  4/18 17:57 SYSAM-LCL init    test  board        2e01
  4/18 17:57 SYSAM-LCL init    clea  mst
  4/18 17:57 SYSAM-LCL init    test  board        2e01

         press CANCEL to quit --  press NEXT PAGE to continue
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

The translation log is written to tape as translation data when the save translation command is executed.

Translation data is time stamped when saved on tape. This time stamp is noted when translation is loaded from tape and included in all recent change history reports.

When a user requests a recent change history report, there could be other users concurrently issuing data commands and altering the contents of the transaction log. Therefore, if the user pages the entire way through the report, the oldest entries in the transaction log may have been overwritten by data commands issued by these other users. Should this occur, the final entries of the report will show the data commands which have been issued by these other users since the recent change history report was originally requested.

Use of the maintenance command "set time" to alter the system clock could make it look as if the recent change history report is not in true LIFO order.

A maximum of 250 commands are stored in the transaction log.

list isdn-testcall

This command displays the ISDN-PRI trunks in use for ISDN-PRI test calls.

SYNOPSIS

list isdn-testcall [schedule **|** print]

PERMISSIONS

The following logins may execute this command: system technician, inads, init.

EXAMPLES

list isdn-testcall
list isdn-testcall print
list isdn-testcall schedule

DESCRIPTION

The list isdn-testcall command lists all of the ISDN-PRI trunks that are currently in use for ISDN-PRI test calls in the system. This command is useful to determine which trunk is in use for an outgoing ISDN-PRI test call.

Defaults

No defaults.

Parameters

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.
print	This parameter will cause the output to be printed by a printer at the SAT.

Help Messages

If the system technician presses help after entering "list isdn-testcall" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If the software data cannot be sent to the SAT, the following message will be displayed:

```
Error encountered, can't complete request.
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy
```

OUTPUT

B-Channel	This field displays the trunk in use for the ISDN-PRI test call (trunk group number/ member number).
Start Time	The time the test call started (DD/HH:MM).
Duration	The expected duration of the test call.
M/T Port	The TN771 Maintenance/Test circuit pack's digital port address(cabinet/carrier/slot/circuit) in use for the outgoing asynchronous ISDN-PRI test call.

```
list isdn-testcall

               ISDN-PRI TESTCALLS
     B-Channel  Start Time    Duration  M/T Port
     078/001    25/12:36      120       1B1102


 Command successfully completed
```

FEATURE INTERACTIONS

None.

list marked-ports

This command lists all the ports that have been marked unusable.

SYNOPSIS

list marked-ports [print | schedule]

PERMISSIONS

The following default logins may execute this command: bcms, browse, system technician, cust, inads, init, rcust.

EXAMPLES

list marked-ports
list marked-ports print
list marked-ports schedule

DESCRIPTION

The list marked-ports command displays all of the ports that have been marked unusable via the mark port command. For more information on the mark port command, refer to the "mark port" command description in this chapter.

A maximum of fifteen marked ports are displayed per page.

Defaults

No defaults.

Parameters

print	If specified, this parameter will cause the information displayed by this command to be sent to the printer attached to the terminal as well as to the screen.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses help after entering "list marked-ports" the following message will be displayed:

```
['print' or 'schedule']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy, try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the marked port.
Board-Type	The type of circuit pack containing the marked port. If this circuit pack information is no longer available because the circuit pack was removed after the port was marked, the Board-Type field will be blank.

For the following output example, the command entered was "list marked-ports."

```
list marked-ports

             MARKED-PORT INFORMATION
     Port     Board-Type
     1C0101   DIG-BD
     1C0601
     1C0702   DIG-BD

 Command successfully completed
```

FEATURE INTERACTIONS

None.

list measurements

This command lists reports summarizing measurements associated with DS1 board. **The list measurements command has many more options than those that are documented here. Only those options dealing with DS1 board are documented below.**

SYNOPSIS

list measurements ds1 [log **|** summary] ds1_location [print **|** schedule]

PERMISSIONS

The following logins may execute this command: browse, system technician, cust, inads, init, nms, bcms, rcust.

EXAMPLES

list measurements ds1 log 2a18
list measurements ds1 summary 2a18 print
list measurements ds1 summary 2a18 schedule

DESCRIPTION

The "list measurements ds1" command provides performance measurements on a DS-1 link. The "ds1 summary" option provides a summary report while the "ds1 log" option provides a detailed report.

The performance measurements of a DS-1 link indicate the quality of the DS-1 physical interface between the system and a far end system.

Defaults

None.

Parameters

ds1_location	The physical location of a DS1 circuit pack entered as cabinet-carrier-slot.
print	This will cause the report to be printed if a printer is linked to the MGR1 terminal.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [2] for more details.

Help Messages

If the system technician presses HELP after entering "list measurements ds1", the following list of options is displayed:

```
log      summary
```

If the system technician presses HELP after entering "list measurements ds1 log" or "list measurements ds1 summary", the following message is displayed:

```
Enter board location: [cabinet(1-3)];carrier(A-E);slot(00-20),
                    ['print' or 'schedule']
```

Error Messages

If the user enters an invalid format for a board location when entering a "list measurements ds1 log" or "list measurements ds1 summary" command, the following error message is displayed:

```
"entered value" Invalid slot address for DS1 board
```

If the user enters a board location that is not a DS1 board location or the location of an unadministered DS1 when entering a "list measurements ds1 log" or "list measurements ds1 summary" command, the following error message is displayed:

```
DS1 board has not been administered
```

If the user enters anything other than "log" or "summary" following "list measurements ds1", the following error message is displayed:

```
"entered value" is an invalid entry; please press HELP
```

If the system time has not been set correctly, after entering "list measurements ds1 log ds1_location" or "list measurements ds1 summary ds1_location" the following error message is displayed:

```
Cannot get time from system clock
```

OUTPUT

The following field descriptions pertain to the summary reports accessed by the "list measurements ds1 summary" command.

Counted Since:	The start time and date when the associated measurement counters were cleared or the DS1 circuit pack was administered.
Number of Seconds Elapsed Into Current 15-min Interval:	The number of seconds from the beginning of the current 15-minute interval. This field has a value from 0 to 900.
Total of Valid 15-min Intervals in Past 24-hr Period:	The total number of 15-minute intervals in the past 24-hour period that contain valid data. This field has a value from 0 to 96.
Category	The four categories correspond to four measurement error counters. The four categories are "Errored Seconds," "Bursty Err Secs," "Severely Err Secs," and "Failed Seconds". The meanings of each category follow: ■ The value of the errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid. ■ The value of the bursty errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid. ■ The value of the severely errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid. ■ The value of the failed seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid.

Worst_ 15-Min_ Interval	The date(Date), end time(Time), and error count (Count; from 0 to 900 in increments of four) of the 15-minute interval in the previous 24-hour period that contains the maximum value for each of the four error categories (errored seconds, bursty errored seconds, severely errored seconds, and failed seconds).
Total of 24-Hour Count	The sum of all valid 15-minute counts for the previous 24-hour period for each of the four error categories. This field has a value from 0 to 65535.
Current 15-Minute Interval	The error count for the current (incomplete) 15-minute interval for each of the four error categories. This field has a value from 0 to 899 or N/A if the data for the current 15-minute interval is invalid.

The following field descriptions pertain to the detailed reports accessed by the "list measurements ds1 log" command.

Counted Since:	The start time and date when the associated measurement counters were cleared or the DS1 circuit pack was administered.
DATE	The date of the 15-minute interval.
TIME	The time of the 15-minute interval.
ERRORED SECONDS	The value of the errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid.
BURSTY ERR SECS	The value of the bursty errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid.
SEVERELY ERR SECS	The value of the severely errored seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid.
FAILED SECONDS	The value of the failed seconds counter for the specified 15-minute interval. This field has a value from 0 to 900 or N/A if the data for the 15-minute interval is invalid.

VALID INTERVAL — This field indicates whether the data for the specified 15-minute interval is valid. Data is considered valid when a count for that 15-minute interval. If the field has a value of 'y', the data for the four error categories is valid; otherwise, the data is invalid. Data is considered valid when a count for that 15-minute interval is retrieved and none of the following invalid conditions occur. Data is invalid if a system warm start or a system cold start occurred during the interval, if the DS1 circuit pack was not inserted during the interval, if the system time was changed during the interval, or if the system was too busy to respond to a poll request for the interval.

The following output examples show all of the four different DS1 reports.

```
list measurements ds1 summary 2a19                     SPE A

 Switch Name:                  Date: 1:25 pm  THU APR 16, 1992

      DS-1 Link Performance Measurements Summary Report

   Counted Since: 1:20 pm  THU APR 16, 1992
   Number of Seconds Elapsed Into Current 15-min Interval: 323
   Total of Valid 15-min Intervals in Past 24-hr Period:   0
                                      Total of  Current
                  Worst_15-Min_Interval    24-hr     15-Min Interval
   Category         Date   Time   Count    Count     Count
 Errored Seconds    4/16   13:20     0      0         4
 Bursty Err Secs    4/16   13:20     0      0         4
 Severely Err Secs  4/16   13:20     0      0         0
 Failed Seconds     4/16   13:20     0      0         0

 Command successfully completed
```

```
list measurements ds1 log 2a19                          SPE A

 Switch Name:                  Date: 1:26 pm  THU APR 16, 1992

      DS-1 Link Performance Measurements Detailed Log Report
   Counted Since: 1:20 pm  THU APR 16, 1992
               ERRORED BURSTY    SEVERELY   FAILED    VALID
   DATE  TIME  SECOND  ERR SECS  ERR SECS   SECONDS   INTERVAL
   4/16   13:05    0     0         0           0        y
   4/16   13:20    0     0         0           0        y

 Command successfully completed
```

FEATURE INTERACTIONS

None.

list mst

This command will allow the user to display messages in the MST buffer.

SYNOPSIS

list mst *from message number count number [continuous | LIFO | FIFO] auto-page*

[schedule | print]

PERMISSIONS

The following logins may execute this command: inads, init.

EXAMPLES

list mst continuous
list mst continuous auto-page
list mst LIFO
list mst from 222 count 7

DESCRIPTION

This command is used to display the messages in the trace buffer. It can be used when the trace is disabled or active, but if active, older messages may be sporadically omitted if wraparound is selected and the message rate is high. This command can be used repeatedly without destroying the integrity of the buffer.

Defaults

The default for the command is to display all messages in FIFO order, i.e., until the displayed message momentarily catches up with the newest message, and not "auto-page".

Parameters

from message number	The message number to start the display may be entered. If the message number specified is not in the buffer, then that will be indicated on the display, and no additional messages will be displayed. If this clause is omitted, then the messages will be displayed starting with the oldest in the buffer for FIFO and for "continuous". For LIFO, the display will start with the newest message in the buffer.
continuous	The display will be updated as new messages enter the trace buffer. The messages will be displayed in FIFO order. This option is most useful in conjunction with "auto-page". The list continuous command will terminate only when canceled by the user.
count	The count of messages to display may be used to limit the trace
LIFO	The messages will be displayed with the current newest message first.
FIFO	The messages will be displayed in the order received.
auto-page	The screen will automatically page when full. When used in combination with "continuous" this provides a nice way to "watch" the trace as messages arrive.
schedule	This parameter will allow access to the system printer feature. The "continuous" option may not be combined with this option.
print	This parameter will cause the output to be printed by a printer at the SAT.

Help Messages

If the user presses HELP after entering "list mst" the following message will be displayed:

```
Enter [ ’from’ 0-32767 ] [ ’count’ 1-9998 ]
   [ ’fifo’ or ’lifo’ or ’continuous’ ]
 [ ’auto-page’ ] [ ’print’ or ’schedule’ ]
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a message by message basis with one or more lines of data displayed for each message traced.

Number	The sequence number for the message.
Date/Time	The Date/Time.
Type	MST message type, ex. 60 == ISDN uplink, 62 == ISDN downlink, 6C == ISDN level 2 primitive.
Message	Message text in hexadecimal (ISDN or X.25).

For the following output example, assume that the command that was entered was "list mst", and that timestamps were enabled via the "change mst" command.

```
list mst
                  MST DATA

 Number  Date/Time    Type  Message
   1   12/21/90
       14:30:21.220  62  00 00 74 17 08 02 00 11 05 04 03 80 90 a2 18
                         03 a1 83 86 70 01 80 96 28 0d 73 74 61 74 69
                         6f 6e 20 35 31 30 30 31
   2   14:30:22.420  60  00 00 74 17 08 02 80 11 02 18 03 a9 83 86
   3   14:30:23.420  60  00 00 74 17 08 02 80 11 03 1e 02 81 81
   4   14:30:25.420  60  00 00 74 17 08 02 80 11 01
   5   14:30:25.820  60  00 00 74 17 08 02 80 11 07 96 28 0d 73 74 61
                         74 69 6f 6e 20 35 31 30 30 34
   6   14:30:28.020  62  00 00 74 17 08 02 00 11 0f
   7   14:50:25.820  71  01
   8   14:52:26.020  56  00 00 70 00 08 01 04 64 96 1c 13 91 a1 10 02
                         01 03 02 01 c4 40 08 96 49 05 83 31 30 30 b4
   9   14:52:26.020  57  00 00 70 00 08 01 84 64 96 1c 0d 91 a2 0a 02
                         01 03 30 05 02 01 c4 40 00

 Command Successfully Completed
```

INTERPRETATION OF OUTPUT

Summary of MST Message Types

Table 10-5. Summary of MST Message Types

Message Type Encode	Description
0x10	Vector Trace message
0x11	Vector Event message
0x21	IMT proc_errs
0x22	IMT crec
0x23	IMT miscellaneous hooks (dbug)
0x30	CCMS uplink message
0x31	CCMS downlink message
0x32	Packet uplink message
0x33	Packet downlink message
0x40	IMT internal-message trace for call_p, conn_m, grp_m, serv_d, suser_m
0x50	ASAI level 2 primitive uplink
0x51	ASAI level 2 primitive downlink
0x52	ASAI maintenance uplink
0x53	ASAI maintenance downlink
0x54	ASAI unrecognized uplink
0x55	ASAI unrecognized downlink
0x56	ASAI association uplink
0x57	ASAI association downlink
0x58	ASAI error uplink
0x60	ISDNPRI uplink
0x62	ISDNPRI downlink
0x64	ISDNBRI uplink
0x66	ISDNBRI downlink

Continued on next page

Table 10-5. Summary of MST Message Types — *Continued*

Message Type Encode	Description
0x68	ISDNBRI level 2 primitive uplink
0x6A	ISDNBRI level 2 primitive downlink
0x6C	ISDNPRI level 2 primitive uplink
0x6D	ISDNPRI level 2 primitive downlink
0x6E	ISDNPRI unrecognized message
0x6F	ISDNBRI unrecognized message
0x71	GAP marker
0x72	Time changed while trace enabled
0xA0	X.25 Outgoing application data message
0xA1	X.25 Incoming application data message
0xA2	X.25 Application error message
0xB0	X.25 Outgoing session layer control message
0xB1	X.25 Incoming session layer control message
0xCF	X.25 Message confirmation
0xD0	X.25 Outgoing processor channel control message
0xD1	X.25 Incoming processor channel control message
0xD2	X.25 Link control message
0xD3	X.25 Link status message
0xE2	X.25 Session Timer Expirations
0xF0	X.25 Error Message (Outgoing Message Lost)
0xF1	X.25 Unrecognized Messages
0xF2	X.25 Error Message (DIP ICOM Record Aborted) (R2 Only)
0xF9	Snapper instrumentation message
0xFA	Snapper continuation message (for large msgs)

Detailed description of Messages**

Note that the X.25 messages discussed below really follow the BX.25 Message Protocol.

** The R2 message set will be defined in the document, OSS Interface Requirement for the Definity Generic 2.2 ISDN-PRI/DCIU Message Sequence Tracer, COMPAS ID 7459DR.

The terminology Message[n] used below refers to the byte at offset n in the message being displayed.

MST message types contain a version number. Whenever the structure of the MST message changes, the version field in the MST buffer will be changed. Version 1 (default) displays a blank in the version field which is immediately after the MST message type field. Subsequent versions display the version number after the MST message type field and are connected with a '-'. For example: Version 2 of the X.25 Application error/notification message has added the text of the pm state table stimulus which was ignored.

Version 1 of MST message type 0xA2 would appear on the 'list mst' output:

Number	Date/Time	Type	Message
1	11:41:22:425	A2	17 10

Version 2of MST message type 0xA2 would appear on the 'list mst' output:

Number	Date/Time	Type	Message
90	12:41:14:112	A2-02	17 10 21 03 32 05 01 80

The following applies for the descriptions below:

— default version number is 1 (blank).

— MST messages which have more than one version will have the layouts for each version included.

— MST messages without a label will be in G3iV1.1-286 and G3iV2-386.

— Anything labeled R3 will also be in G3iV1.1-286 and G3iV2-386.

— Anything labeled R1 will also be in G3iV1.1-286, G3iV2-386, and G3sV2.

— Anything labeled D92 will only be in G3iV1.1-286, G3iV2-386, and G3sV2.

Vector Trace (G3 Only)

Message type:

0x10

Message format:

Message[1-4]	= call identifier (CID) (defined in $BASEPJ/hdrs/capro.h)
Message[5-6]	= vector number (defined in $BASEPJ/hdrs/dpm_calls.h)
Message[7]	= step number (defined in $BASEPJ/hdrs/callr.h)
Message[8]	= step type (defined in $BASEPJ/hdrs/dpm_calls.h)
Message[9]	= step state (defined in $BASEPJ/hdrs/dpm_calls.h)
Message[10-12]	= VDN
Message[13]	= port network number
Message[14]	= endpoint number
Message[15]	= angel number
Message[16]	= circuit number
Message[17-20]	= trunk number
Message[21+]	= auxiliary data (based on step type)

Vector Event Trace (D92 Only)

Message type:

0x11

Message format:

Message[1-4]	= cid (defined in $BASEPJ/hdrs/capro.h)
Message[5-6]	= event
Message[7+]	= auxiliary data (based on event)

Events are defined in $BASEPJ/hdrs/evnt_defs.h. Events based on the call_p will have the following auxiliary data:

Message[7-8]	= vector number
Message[9-10]	= step number

Events based on the grp_m will have the following auxiliary data:

Message[7-10]	= hunt group number

IMT (D92)

The messages described in this section cannot be controlled directly through any of the MST screens. They are enabled/disabled through TCM but their output goes to the MST buffer. See [IMT] for details on these messages.

A read-only field in the "change mst" screen, "Other Tracing?", alerts the user that one or more of these types of messages is enabled.

0x21 - IMT proc_errs

Message format:

Message[1-4]	= process number(lname)
Message[5-8]	= sequence number (defined in *.p/hdrs/main_err.h, for example: $BASEPJ/gmtce.ss/hmm.p/hdrs/main_err.h)
Message[9-12]	= data 1
Message[13-17]	= data 2

0x22 - IMT crec

Message format:

Message[1+]	= call record (defined as CALLR typedef in $BASEPJ/hdrs/callr.h)

0x23 - MT_IMT (miscellaneous IMT hooks)

This message type is for miscellaneous IMT hooks. The only sub-type currently available is for a debug button (dbut). The button number is provided in the debug button MST message so that more than one button can be administered (through IMT) to convey different meanings. For example, depression of button N could signify the start of the problem symptoms, while depression of button N + X could signify the end of the problem symptoms. Note that the button number being logged represents the position of a button on a particular set type, and will be different depending on set type and module type (feature, coverage, display, ...), etc. The mapping of the button number stored in the IMT_BUT_DEBUG MST message to a position on the set is not trivial, however, the debug buttons can be administered through TCM, debug button filtering enabled through TCM and

MST enabled using the 'enable mst' command and the resultant messages sent to MST when each button is depressed can be examined for the button data and noted.

Message format:

Message[1]	= 0x01 (debug button sub-type, IMT_BUT_DEBUG)
Message[2-3]	= button number
Message[4-7]	= user id

0x40 - internal message tracing of call_p, conn_m, grp_m, serv_d, suser_m

Message formats: conn_m, grp_m, and suser_m:

Message[1-4]	= user identifier
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7+]	= standard message (depends on hook type)

serv_d (map-type messages):

Message[1-4]	= user identifier
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7]	= STIM type
Message[8-11]	= service identifier
Message[12]	= port network number
Message[13]	= endpoint number
Message[14]	= angel number
Message[15]	= circuit number
Message[16+]	= message

serv_d (other serv_d messages):

Message[1-4]	= user identifier
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7]	= STIM type
Message[8-11]	= service identifier

Message[12-13]	= interpreted STIM
Message[14-17]	= aux data 0
Message[18-21]	= aux data 1
Message[22-25]	= aux data 2
Message[26-29]	= aux data 3
Message[30]	= hwtype field
Message[31]	= hwdata field

call_p:

Message[1-4]	= call identifier
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7]	= supervisor
Message[8]	= digit prep
Message[9+]	= message

CCMS (D92)

Message types:

0x30 uplink
0x31 downlink

Message format:

Message[1]	= port network number
Message[2]	= endpoint number
Message[3]	= angel number
Message[4]	= circuit number
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7]	= message length
Message[8]	= angel id
Message[9+]	= standard CCMS message

Packet (D92)

Message type:

0x32 uplink

Message format:

Message[1-4]	= user identifier
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7-10]	= link identifier
Message[11-12]	= message type (defined in $BASEPJ/hdrs/pcd_calls.h)
Message[13+]	= standard packet message

Message type:

0x33 downlink

Message format:

Message[1]	= port network number
Message[2]	= endpoint number
Message[3]	= angel number
Message[4]	= circuit number
Message[5-6]	= hook identifier (defined in $BASEPJ/hdrs/mstencode.h)
Message[7-10]	= link identifier
Message[11+]	= standard packet message

ASAI

ASAI messages listed on the MST screen consist of a 4 octet header and a variable length body. The header contains the ASAI port address encoded with 8 hexadecimal digits. This same encoding is also used for BRI and PRI.

In message types other than 50 and 51 (Level 2 Primitives), following the port address is a one octet field called the qualifier. The meaning of the qualifier varies according to the type (as specified by the MST encode) of ASAI message traced. The body which is a real ASAI message (except for Level 2 Primitives) follows the qualifier.

When the display is administered for abbreviated format, the body contains only the initial part of the ASAI message (all information in beginning of message up to and including the Q.931 IE tag) plus the cause IE (if present).

0x50 - ASAI level 2 uplink primitive

Message[1]	= Port Network Number of ASAI port
Message[2]	= reserved
Message[3]	= Carrier Address of ASAI port
Message[4]	= Port number of ASAI port
Message[5]	= SAPI
Message[6]	= TEI

R1:

Message[7,8]	= Link ID
Message[9]	= Uplink encode 0x01 - ASAI Link State 0x02 - TEI Management Message 0x03 - XID Message
Message[10]	= R1/R3 Link States: 0x00 - the link has gone down 0x01 - the link has come up 0x02 - the link id has changed 0x03 - the link has gone hyperactive 0x04 - the link has recovered 0x05 - the audit recovery stim 0x06 - the link has been reset 0x07 - link state hyper (too many SABMEs) disconnect 0x08 - broadcast link audit
	= R1/R3 TEI Management Message 0x01 - Identity request 0x05 - Identity Check Response 0x07 - Identity Verify Request
	= R1/R3 XID Messages 0x01 - XID Request 0x02 - XID Response

R3:

Message[7-10] = Link ID

Message[11] = Uplink encode
0x01 - ASAI Link State
0x02 - TEI Management Message
0x03 - XID Message

Message[12] = ASAI Link State:
0x00 - the link has gone down
0x01 - the link has come up
0x02 - the link id has changed
0x03 - the link has gone hyperactive
0x04 - the link has recovered
0x05 - the audit recovery stim
0x06 - the link has been reset
0x07 - link state hyper (too many SABMEs) disconnect
0x08 - broadcast link audit

= TEI Management Message
0x01 - Identity request
0x05 - Identity Check Response
0x07 - Identity Verify Request

= XID Messages
0x01 - XID Request
0x02 - XID Response

0x51 - ASAI level 2 downlink primitive

Message[1] = Port Network Number of ASAI port

Message[2] = Reserved

Message[3] = Carrier Address of ASAI port

Message[4] = Port number of ASAI port

Message[5] = SAPI

Message[6] = TEI

R1:

Message[7,8] = Link ID

NOTE:
The Link ID has no meaning for the link establish request, therefore the Link ID field will contain 0xff 0x.ff

Message[9] = Downlink encode
0x01 - ASAI Link Events
0x02 - TEI Management Message
0x03 - XID Message

Message[10] = ASAI Link Events:
0x02 - link release request
0x0f - link establish request sent to and received by the lower level

= TEI Management Message
0x02 - Identity Assigned
0x04 - Identity Check Request
0x06 - Identity Remove

= XID Messages
0x01 - XID Request
0x02 - XID Response

Message[11] = 0xCA - Cancel Byte

NOTE:
The cancel byte will only be present if the message was built, but could not be sent.

R3:

Message[7-10] = Link ID

NOTE:
The Link ID has no meaning for the link establish request, therefore the Link ID field will contain 0xff 0xff 0xff 0x.ff

Message[11]	= Downlink encode 0x01 - ASAI Link Events 0x02 - TEI Management Message 0x03 - XID Message
Message[12]	= ASAI Link Events: 0x02 - link release request 0x0f - link establish request sent to and received by the lower level
	= TEI Management Message 0x02 - Identity Assigned 0x04 - Identity Check Request 0x06 - Identity Remove
	= XID Messages 0x01 - XID Request 0x02 - XID Response
Message[13]	= 0xCA - Cancel Byte

NOTE:
The cancel byte will only be present if the message was built, but could not be sent.

0x52 - ASAI maintenance uplink

Message[1] = Port Network Number of ASAI port
Message[2] = Reserved
Message[3] = Carrier Address of ASAI port
Message[4] = Port number of ASAI port
Message[5] = 0
Message[6+] = standard or abbreviated ASAI message format

0x53 - ASAI maintenance downlink

Message[1] = Port Network Number of ASAI port
Message[2] = Reserved
Message[3] = Carrier Address of ASAI port
Message[4] = Port number of ASAI 3 ort
Message[5] = 0
Message[6+] = standard or abbreviated ASAI message format

0x54 - ASAI unrecognized uplink

Message[1] = Port Network Number of ASAI port
Message[2] = Reserved
Message[3] = Carrier Address of ASAI port
Message[4] = Port number of ASAI port
Message[5] = failure cause

Failure causes

0x2a (42.) - Overload Controls in Effect
0x32 (50.) - Requested Feature Not Administered
0x45 (69.) - Requested Feature Not Implemented
0x51 (81.) - Invalid CRV
0x5f (95.) - Invalid Message
0x60 (96.) - Mandatory Information Element Missing
0x61 (97.) - Message Non-Existent/Not Implemented
0x63 (99.) - Information Element non-existent
0x64 (100.) - Invalid Information Element Contents
0x6f (111.) - Protocol Error

Message[6+] = standard or abbreviated ASAI message format

NOTE:
An unrecognized message displayed in abbreviated format may be missing information (such as cause) because the message was not able to be parsed.

0x55 - ASAI unrecognized downlink

Message[1] = Port Network Number of ASAI port

Message[2] = Reserved

Message[3] = Carrier Address of ASAI port

Message[4] = Port number of ASAI port

Message[5] = failure reason

Failure reasons

1 - link flow controlled
2 - internal software error - see software error log
3 - packet interface problem - see error log

Message[6+] = standard or abbreviated ASAI message format

0x56 - ASAI association uplink

Message[1] = Port Network Number of ASAI port

Message[2] = Reserved

Message[3] = Carrier Address of ASAI port

Message[4] = Port number of ASAI port

Message[5] = association type

Association Type

0 - unknown
1 - call control
2 - domain control
3 - notification

4 - adjunct routing
5 - set value
6 - value query
7 - request feature

Message[6+] = standard or abbreviated ASAI message format

0x57 - ASAI Association downlink

Message[1] = Port Network Number of ASAI port

Message[2] = Reserved

Message[3] = Carrier Address of ASAI port

Message[4] = Port number of ASAI port

Message[5] = association type

Message[6+] = standard or abbreviated ASAI message format

0x58 - ASAI error uplink

Message[1] = Port Network Number of ASAI port

Message[2] = Reserved

Message[3] = Carrier Address of ASAI port

Message[4] = Port number of ASAI port

Message[5] = failure cause

Failure causes

1 - 127 are code standard zero cause values
128 - 255 are code standard three cause values (+ 128)

Message[6+] = standard or abbreviated ASAI message format

ISDN

0x60 - ISDN PRI uplink

Message[1]	= Port Network Number of D-channel port
Message[2]	= Reserved
Message[3]	= Carrier Address of D-channel port
Message[4]	= Port number of D-channel port
Message[5+]	= standard ISDNPRI format

NOTE:
In abbreviated format, the header of the Q.931 message, the cause IE (if present) and the channel id Information Element (IE) (if present) are the only IEs present.

0x62 - ISDN PRI downlink

Message[1]	= Port Network Number of D-channel port
Message[2]	= Reserved
Message[3]	= Carrier Address of D-channel port
Message[4]	= Port number of D-channel port
Message[5+]	= standard ISDNPRI format

NOTE:
In abbreviated format, the header of the Q.931 message, the cause IE (if present) and the channel id IE (if present) are the only IEs present.

0x64 - ISDN BRI uplink

Message[1]	= Port Network Number of BRI port
Message[2]	= Reserved
Message[3]	= Carrier Address of BRI port
Message[4]	= Port number of BRI port
Message[5]	= SAPI
Message[6]	= TEI

R1:

Message[7,8]	= Link ID
Message[9+]	= standard ISDNBRI format

R3:

Message[7-10]	= Link ID
Message[11+]	= standard ISDNBRI format

NOTE:
In abbreviated format, the header of the Q.931 message, the cause IE (if present) and the channel id Information Element (IE) (if present) are the only IEs present.

0x66 - ISDN BRI downlink

Message[1] = Port Network Number of BRI port
Message[2] = Reserved
Message[3] = Carrier Address of BRI port
Message[4] = Port number of BRI port
Message[5] = SAPI
Message[6] = TEI

R1:

Message[7,8] = Link ID
Message[9+] = standard ISDNBRI format

R3:

Message[7-10] = Link ID
Message[11+] = standard ISDNBRI format

NOTE:
In abbreviated format, the header of the Q.931 message, the cause IE (if present) and the channel id IE (if present) are the only IEs present.

An additional cancel byte (0xCA) may be present after the standard ISDNBRI formatted message if the message was not sent. The cancel byte will not be appended if the abbreviated format is selected.

0x68 - ISDN BRI level 2 uplink primitive

Message[1] = Port Network Number of BRI port
Message[2] = Reserved
Message[3] = Carrier Address of BRI port
Message[4] = Port number of BRI port
Message[5] = SAPI
Message[6] = TEI

R1:

Message[7,8] = Link ID
Message[9] = Uplink encode
0x01 - BRI Link State
0x02 - TEI Management Message
0x03 - XID Message

Message[10] = R1/R3 Link States:
0x00 - the link has gone down
0x01 - the link has come up
0x02 - the link id has changed
0x03 - the link has gone hyperactive
0x04 - the link has recovered
0x05 - the audit recovery stim
0x06 - the link has been reset
0x07 - link state hyper (too many SABMEs) disconnect
0x08 - broadcast link audit

= R1/R3 TEI Management Message
0x01 - Identity request
0x05 - Identity Check Response
0x07 - Identity Verify Request

= R1/R3 XID Messages
0x01 - XID Request
0x02 - XID Response

R3:

Message[7-10] = Link ID

Message[11] = Uplink encode
0x01 - BRI Link State
0x02 - TEI Management Message
0x03 - XID Message

Message[12] = BRI Link State:
0x00 - the link has gone down
0x01 - the link has come up
0x02 - the link id has changed
0x03 - the link has gone hyperactive
0x04 - the link has recovered
0x05 - the audit recovery stim
0x06 - the link has been reset
0x07 - link state hyper (too many SABMEs)
disconnect
0x08 - broadcast link audit

= TEI Management Message
0x01 - Identity request
0x05 - Identity Check Response
0x07 - Identity Verify Request

= XID Messages
0x01 - XID Request
0x02 - XID Response

0x6A - ISDN BRI level 2 downlink primitive

Message[1] = Port Network Number of BRI port

Message[2] = Reserved

Message[3] = Carrier Address of BRI port

Message[4] = Port number of BRI port

Message[5] = SAPI

Message[6] = TEI

R1:

Message[7,8] = Link ID

NOTE:
The Link ID has no meaning for the link establish request, therefore the Link ID field will contain 0xff 0xff

Message[9]	= Downlink encode 0x01 - BRI Link Events 0x02 - TEI Management Message 0x03 - XID Message
Message[10]	= BRI Link Events: 0x02 - link release request 0x0f - link establish request sent to and received by the lower level
	= TEI Management Message 0x02 - Identity Assigned 0x04 - Identity Check Request 0x06 - Identity Remove
	= XID Messages 0x01 - XID Request 0x02 - XID Response
Message[11]	= 0xCA - Cancel Byte

NOTE:
The cancel byte will only be present if the message was built, but could not be sent.

R3:

Message[7-10]	= Link ID

NOTE:
The Link ID has no meaning for the link establish request, therefore the Link ID field will contain 0xff 0xff 0xff 0x.ff

Message[11] = Downlink encode
0x01 - BRI Link Events
0x02 - TEI Management Message
0x03 - XID Message

Message[12] = BRI Link Events:
0x02 - link release request
0x0f - link establish request sent to and received by the lower level

= TEI Management Message
0x02 - Identity Assigned
0x04 - Identity Check Request
0x06 - Identity Remove

= XID Messages
0x01 - XID Request
0x02 - XID Response

Message[13] = 0xCA - Cancel Byte

NOTE:
The cancel byte will only be present if the message was built, but could not be sent.

0x6C - ISDN PRI level 2 uplink primitive

Message[1] = Port Network Number of D-channel port

Message[2] = Reserved

Message[3] = Carrier Address of D-channel port

Message[4] = Port number of D-channel port

Message[5] = change type

R1/R3 change types:
0x01 - session up notification

0x02 - Session down notification
0x6D - ISDN PRI level 2 downlink primitive (not implemented)

Message[1]	= Port Network Number of D-channel port
Message[2]	= Reserved
Message[3]	= Carrier Address of D-channel port
Message[4]	= Port number of D-channel port
Message[5]	= change type

R1/R3 change types:
0x01 - link establish request
0x02 - link release request

0x6E - ISDN PRI Unrecognized Messages

Message[1]	= Port Network Number of D-channel port
Message[2]	= Reserved
Message[3]	= Carrier Address of D-channel port
Message[4]	= Port number of D-channel port
Message[5]	= type of failure

Types of failure:
0x01 - outgoing ISDNPRI
0x02 - incoming ISDNPRI

Message[6+]	= standard ISDN format

0x6F - ISDN BRI Unrecognized Messages

Message[1] = Port Network Number of BRI port

Message[2] = Reserved

Message[3] = Carrier Address of BRI port

Message[4] = Port number of BRI port

Message[5] = SAPI

Message[6] = TEI

R1:

Message[7,8] = Link ID

Message[9] = type of failure

Types of failure:

0x01 - outgoing ISDN
0x02 - incoming ISDN

Message[10+] = standard ISDNBRI format

R3:

Message[7-10] = Link ID

Message[11] = type of failure

Types of failure:

0x01 - outgoing ISDN
0x02 - incoming ISDN

NOTE:
In abbreviated format, the header of the Q.931 message, the cause IE (if present) and the channel id IE (if present) are the only IEs present.

An additional cancel byte (0xCA) may be present after the standard ISDNBRI formatted message if the message was not sent. The cancel byte will not be appended if the abbreviated format is selected.

General

0x71 - GAP marker

Message[1] = GAP reason
Message[2] = GAP count (since last clear - high byte)
Message[3] = GAP count (since last clear - low byte)

GAP reasons:

0x01 - disabled, disable mst command executed
0x02 - disabled, mst timer expired
0x03 - disabled, buffer full on no-wrap
0x04 - disabled, restart occurred
0x05 - disabled, by stop trigger or count
0x06 - disabled, audit error
0x07 - not disabled, stopped by stop trigger or count

0x72 - Time changed while trace enabled

Message[1] = 0x00
Message[2] = timestamp indication

timestamp indication:

0x00 - MST timestamp is old time
0x01 - MST timestamp is new time

X.25 Application Data

The processor channel number is the R1/R3 term, and R2 calls it the port number. The processor channel number is equal to the Application port number in R1. In R3, the processor channel admin screen should be inspected to determine the mapping.

0xA0 - X.25 outgoing application message

Message[1]	= processor channel number
Message[2]	= sequence number
Message[3]	= buffer id
Message[4]	= 0x00
Message[5+]	= application message[1]

1 Application messages will contain the session layer data headers and the data.

In abbreviated mode, the application message is not saved.

0xA1 - X.25 incoming application message

Message[1]	= processor channel number
Message[2]	= sequence number
Message[3+]	= application message

In abbreviated mode, the application message is not saved.

Application Control

0xA2 - X.25 application error or notification

NOTE:
The 'X.25 application error message' category contains notifications as well as errors.

0xA2, 0xF0 and 0xF2 messages will be turned on by responding 'y' to the 'Application Errors?' field.

Version 1:

Message[1]	= processor channel number
Message[2]	= application error/notification

Version 2:

Message[1]	= processor channel number
Message[2]	= application error/notification
Message[3+]	= pm stimulus ignored (For message[2] == 0x10 only)

Errors/Notifications:

R1/R3:

0x01 - no outgoing buffer available
0x05 - pvc session down
0x06 - pvc session up
0x07 - pvc session connect
0x08 - pvc session restart
0x09 - message buffer overload uplink
0x0A - message buffer overload downlink
0x0B - message buffer exhaustion
0x0C - max # of outgoing msgs allowed
0x0D - bad msg type in message buffer routine
0x0E - no message buffers available
0x0F - message buffer pointer error
0x10 - pm state table stimulus ignored
0x11 - bad session connect message

Session Layer Control

NOTE:
The session layer header is considered part of the session layer message.

0xB0 - X.25 outgoing session layer control message

Message[1]	= processor channel number
Message[2]	= session layer message type
Message[3]	= buffer id
Message[4]	= 0
Message[5+]	= session layer message

session layer message type:

0x00 - session connect
0x01 - session accept
0x02 - session reject
0x03 - session disconnect
0x04 - reserved
0x05 - reserved
0x06 - resynch
0x07 - reserved
0x08 - resynch acknowledge

In abbreviated mode, the session layer message is not saved.

0xB1 - X.25 incoming session layer control message

Message[1]	= processor channel number
Message[2]	= session message type
Message[3+]	= session message

session message type:

0x00 - session connect
0x01 - session accept
0x02 - session reject
0x03 - session disconnect
0x04 - reserved
0x05 - reserved
0x06 - resynch
0x07 - reserved
0x08 - reserved

In abbreviated mode, the session layer message is not saved.

0xCF - message confirmation

This confirmation is X.25 far end confirmation.

Message[1]	= processor channel number
Message[2]	= internal buffer id
Message[3]	= count of outgoing buffers confirmed

Processor Channel Control

0xD0 - outgoing control message

Message[1] = processor channel number

Message[2] = message event

Message events for R1:

0x00 - Request Reset of Logical Channel
0x05 - Ack. Reset of Logical Channel
0x06 - Flow Control Uplink
0x07 - Release Uplink Flow Control
0x0A - Flow Control Downlink
0x0B - Release Downlink Flow Control

Message events for R3:

0x00 - Request Reset of Logical Channel
0x08 - Connect Processor Channel
0x09 - Disconnect Processor Channel
0xD1 - X.25 incoming control message

Message[1] = processor channel number

Message[2] = message event

R1 Message events:

0x01 - Performed Requested Reset of Logical Channel
0x06 - Resetting Logical Channel
0x0A - Level 3 Restart[1]

R3 Message events:

0x01 - Performed Requested Reset of Logical Channel
0x06 - Resetting Logical Channel
0x08 - processor channel connected
0x09 - processor channel disconnected

1. If this event occurs, one restart for each logical channel will be written into the MST trace.

Link Control

0xD2 - link control

Message[1] = interface link number

Message[2] = message event

R1 Message events:

0x00 - Busy Out Link
0x01 - Release Busied Out Link
0x0A - Level 3 Restarting

R3 Message events:

0x00 - Stop Link
0x01 - Start Link
0x0A - Level 3 Restarting

0xD3 - link status (R3 Only)

Message[1] = interface link number

Message[2] = message event

R3 Message events:

0x02 - Session Down
0x03 - Session Up

Session Sanity

0xE2 - X.25 Session Timer Expirations

Message[1] = processor channel number

Message[2] = timer

Timers:

0x00 - ST2(session connect)
0x01 - ST3(retransmission)

Message[3] = countdown from A1

0x02 - ST4(resynchronization)

No count

0x03 - ABT1(abort session 1)

Message[3] = protocol machine state where timeout occurred

0x04 - ABT2(abort session 2)

Message[3] = protocol machine state where timeout occurred

0x05 - State Timer

Message[3] = protocol machine state where timeout occurred

0x06 - Message Timer

Message[3] not used

Protocol Machine States:

BAD_STATE	0x00 /* 0 is very common, don't use as a state */
PT_UNALLOC	0x01 /* port is un-allocated */
QUIESCENT	0x02 /* quiescent - allocated but not used */
ENTER_wSA	0x03 /* entering wSA - reset issued, not ABT/CON */
W_ACCEPT	0x04 /* Waiting for Session Accept*/
DATA_XFER	0x05 /* Data Transfer State*/
DATA_RESYNC	0x06 /* Resynchronization state */
PRI_ALLOC	0x07 /* pri port allocated but not yet used */
PRI_CONN	0x08 /* pri port connected */
HIGH_STATE	0x08 /* Highest value a port state can be*/

X.25 Errors

0xF0 - X.25 Error Message (Outgoing Message Lost)

Note that 0xA2, 0xF0 and 0xF2 messages will be turned on by responding ’y’ to the ’Application Errors?’ field.

Version 1:

Message[1]	= processor channel number
Message[2]	= sequence number
Message[3+]	= message

Version 2:

Message[1]	= processor channel number
Message[2]	= sequence number
Message[3]	= reason code
Message[4+]	= message

Reason Codes:

```
0x00   /* message lost */
       /* 1 reserved */
0x02   /* message ignored, sequence number is within window but less
        * than expected
        */
0x03   /* message ignored, bad sequence number */
0x04   /* message ignored, other port has sent a disconnect message */
0x05   /* message ignored, send request is rejected*/
0x06   /* message ignored, from ig_l3 */
0x07   /* message ignored, from l3_err */
0x08   /* sequence number is within window but less
        * than expected (resync)
        */
0x09   /* bad sequence number (resync) */
```

In abbreviated mode, the application message is not saved.

0xF1 - Unrecognized X.25 Messages

Message[1]	= processor channel number
Message[2]	= Failure type
Message[3+]	= session message

Failure types:

0x00 - Reserved
0x01 - Unknown session layer message type
0x02 - unrecognized control message

0xF2 - BX.25 Error Message (DIP ICOM Record Aborted)

R2 only

FEATURE INTERACTIONS

See documentation on the system printer feature.

list testcalls

This command generates an Automatic Transmission Measurement System (ATMS) measurement report.

SYNOPSIS

list testcalls detail *[grp group number to-grp group number mem member number to-mem member number | port location] [result result identifier | not-result result identifier] count count number [print | schedule]*

list testcalls summary *grp group number to-grp group number count count number [print | schedule]*

PERMISSIONS

The following logins may execute this command: browse, system technician, cust, inads, init, nms.

EXAMPLES

list testcalls detail
list testcalls detail print
list testcalls detail grp 78
list testcalls detail grp 78 result marg count 3 schedule
list testcalls detail grp 78 to-grp 80
list testcalls detail grp 78 to-grp 80 mem 1 print
list testcalls detail grp 78 to-grp 80 mem 1 not-result pass
list testcalls detail grp 78 to-grp 80 mem 1 count 2 schedule
list testcalls detail grp 78 to-grp 80 mem 1 to-mem 5
list testcalls detail grp 78 to-grp 80 mem 1 to-mem 5 count 3 print
list testcalls detail grp 78 to-grp 80 mem 1 to-mem 5 count 3 result pass
list testcalls detail mem 1 count 3 result pass
list testcalls detail to-grp 78 to-mem 4 count 3 result pass
list testcalls detail to-mem 3 result pass
list testcalls detail port 1c1504
list testcalls detail port 1c1504 count 5 schedule
list testcalls detail port 1c1504 count 5 not-result marg print
list testcalls summary
list testcalls summary grp 78
list testcalls summary grp 78 print
list testcalls summary grp 78 count 5
list testcalls summary grp 78 count 5 schedule
list testcalls summary grp 78 to-grp 80
list testcalls summary grp 78 to-grp 80 count 3
list testcalls summary to-grp 78
list testcalls summary to-grp 78 count 7 schedule

DESCRIPTION

The list testcalls command is used to examine ATMS trunk measurements. The ATMS is a feature which allows the voice and data trunk facilities to be measured for satisfactory transmission performance. The performance of the trunks are evaluated according to measurements produced by a series of analog tests and are compared against user defined threshold values. The list testcalls command is a reporting mechanism designed to display the measurements produced by these tests.

The measurement report contains data on trunk signal loss, noise, singing return loss, and echo return loss. The purpose of the report is to provide measurement data to help determine the quality of trunk lines.

The measurements are produced by a set of analog trunk tests. The tests are initiated by a maintenance demand test or by a set of scheduled tests. The largest portion of these measurements are generated through scheduled testing during system quiet hours (hours where the traffic volume is low). Each trunk test performed by the system stores the results in a database. The trunk measurements in this database reflect the state of each trunk at the time of its last test.

Defaults

None.

Parameters

detail	This option specifies that a detailed measurement report is displayed (See example of the screen).
summary	This option specifies that a summary measurement report is displayed (See example of the screen).
grp group number	This option is used to specify that measurements for a specific trunk group are displayed. When used with the "to-grp" option, this option is the starting trunk group in a range of user specified trunk groups.
to-grp group number	This option is used to specify that measurements for all trunk groups from 1 to the specified "to-grp" trunk group are displayed. When used with the "grp" option, this option is the ending trunk group in a range of user specified trunk groups.

mem member number	This option is used to specify that measurements for a specific trunk group member are displayed. When used with the "to-mem" option, this option is the starting trunk group member in a range of user specified trunk group members.
to-mem member number	This option is used to specify that measurements for all trunk group members from 1 to the specified "to-mem" trunk group member are displayed. When used with the "mem" option, this option is the ending trunk group member in a range of user specified trunk group members.
port location	This option is used to specify that measurements for a specific trunk circuit (port) are displayed.
result result identifier	This option is used to filter out all measurement results that do not match the user specified result (i.e. only measurement results that match the user specified result are displayed). Examples of results are pass, marg, fail, etc.
not-result result identifier	This option is used to filter out all measurement results that do match the user specified result (i.e. only measurement results that do not match the user specified result are displayed). Examples of results are pass, marg, fail, etc.
count count number	This option is used to specify (limit) the number of records displayed.
print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "list testcalls", the following message is displayed:

```
Please enter one of the following object command words:
           detail          summary
     Or press CANCEL to cancel the command
```

If the system technician presses HELP after entering "list testcalls detail", the following message is displayed:

```
Enter [['grp' x],['to-grp' x],['mem' x],['to-mem' x] or ['port' x]],
[['result' x] or ['not-result' x]],['count' x],['print' or 'schedule']
```

If the system technician presses HELP after entering "list testcalls summary", the following message is displayed:

```
Enter [['grp' x],['to-grp' x],[['count' x],
['print'] or ['schedule']
```

Error Messages

If there are no records in the measurements database, the following message is displayed:

```
No data in the system to list
```

If an invalid identifier is entered, the following message is displayed:

```
"identifier" is an invalid entry; please press HELP
```

If an invalid count identifier is entered, the following message is displayed:

```
"identifier" is an invalid identifier; press RETURN to execute modified
command
```

If an invalid port location or unadministered port location is entered, the following message is displayed:

```
"identifier" Identifier invalid
```

If the user entered trunk group number or the trunk group member number is not within a valid range, the following message is displayed:

```
Entry out of range
```

If the user entered trunk group number or the trunk group member number is not administered, or the user entered result is not found, the following message is displayed:

```
No records match the specified query options
```

DETAIL REPORT OUTPUT

Group	The trunk group number selected.
Type	The trunk group type.
Vendor	The vendor of this trunk group.
TTL Type	The kind of test line for this trunk group.
Threshold Values	The list of marginal and unacceptable threshold values defined on the trunk group form.
	The following fields appear on the lower section of the form. Many of the column headings contain the abbreviations "FE" for far end and "NE" for near end. These abbreviations define which end took the measurements.
Trk Mem	The trunk member within the trunk group.
Test Date	The month and day this trunk was tested.
Test Time	The time of day this trunk was tested.
Tst Rslt	This field describes the results of the trunk transmission test.
1004Hz-loss Min	Far-to-near and near-to-far measurements of 1004-Hz loss from low-level tone.
1004Hz-loss Max	Far-to-near and near-to-far measurements of 1004-Hz loss at 0 dBm.
Loss dev at 404Hz	Transmission tests at low frequency. These tests measure a maximum positive and negative deviation of +9 and -9 dB from the 1004-Hz loss measurements.
Loss dev at 2804Hz	Transmission tests at high frequency. These tests measure a maximum positive and negative deviation of +9 and -9 dB from the 1004-Hz loss measurements.
C-msg Noise	Maximum noise interference (in dBrnC: decibels above reference noise, which is B(EQ)10 sup -12E(EQ) watts) terminating on a voice terminal within the voice-band frequency range (500 to 2500 Hz) between 15 and 55 dBrnC.
C-ntch Noise	Maximum signal-dependent noise interference on a line between 34 and 74 dBrnC.

SRL-LO	Singing return loss from 0 to 40 dB between the sum of the circuit (repeater) gains and the sum of the circuit losses. SRL-LO occurs most often in the frequency range of 200 to 500 Hz.
SRL-HI	Singing return loss from 0 to 40 dB between the sum of the circuit (repeater) gains on a circuit and the sum of the circuit losses. SRL-HI occurs most often in the frequency range of 2500 to 3200 Hz.
ERL	Echo return loss from 0 to 40 dB between the level of signal strength transmitted and the level of signal strength reflected. ERL occurs most often in the frequency range of 500 to 2500 Hz.

For the following example, the command that was entered is "list testcalls detail grp 80."

```
list testcalls detail grp 80                  Page   1   SPE A

                         ATMS MEASUREMENT REPORT

 Group: 80   Type: co     Vendor:           TTL Type: 105-w-rl

 THRESHOLD VALUES           Loss dev at

                     1004Hz-loss  404Hz 2804Hz C-msg C-ntch SRL SRL
                      Min   Max   -  +  -  +   Noise Noise  LO  HI   ERL
           Marginal   -2   21    9  9  9  9     55    74   0   0    0
       Unacceptable   -2   21    9  9  9  9     55    74   0   0    0
 Trk Test  Test  Test -16dBm  0dBm
 Mem Date  Time  Rslt  NE FE NE FE  NE FE NE FE  NE FE NE FE  NE FE NE FE  NE FE
 1
 2
 3
 4
 5
 6
 7
 8
 9

        press CANCEL to quit -- press NEXT PAGE to continue
```

SUMMARY REPORT OUTPUT

Trk Grp Num	The trunk group number which is being summarized. Only outgoing or two-way analog trunks will be listed.
Num Of Trks	The total number of members per trunk group.
Last Test Date	The date of the oldest measurement in the trunk group.
Last Test Time	The time of the oldest measurement in the trunk group.
Trunks Passed Transm Test	The number of trunks that have passed the trunk transmission tests.
Trunks Failed Marginal Threshld	The number of trunks that failed a marginal threshold, but not an unacceptable threshold according to the threshold values defined on the trunk group form.
Trunks Failed Unaccept Threshld	This is taken from the unacceptable threshold administered on the Trunk group form.
Trks In-Use	The number of trunks that were in-use at the time of testing.
Trks Not Test	The number of trunks that were not tested due to error conditions.
Busied Out Trunks	The number of trunks that were busied out at the time. This could be due to hardware problems, incorrect threshold values, etc.

For the following example, the command that was entered is "list testcalls summary grp 80."

```
list testcalls summary grp 80                       SPE A

                        ATMS MEASUREMENT SUMMARY REPORT

                         Trunks  Trunks   Trunks
 Trk  Num   Last   Last  Passed  Failed   Failed    Trks Trks  Busied
 Grp  Of    Test   Test  Transm  Marginal Unaccept  In-  Not   Out
 Num  Trks  Date   Time   Test   Threshld Threshld  Use  Test  Trunks

 80   19                   0       0        0       0    19    19


 Command successfully completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

The ATMS feature must be turned "on" before the "list testcalls" command can be accessed. The "change system-parameters customer-options" form is used to turn "on" the ATMS feature.

These "list testcalls" reports interact with the trunk threshold values defined on the trunk group form. The marginal values defined on that form will be used to highlight measurements on the SAT report which are out of tolerance. The unacceptable values will be used to identify (by blinking) the trunk members on the SAT report which are unusable. These mechanisms will help a user to quickly identify out of tolerance or unusable trunks. The determination of the trunk threshold values or marginal values are done at the time of the list command, not at the test execution time.

Trunk transmission measurements must have been collected in order for the reports to be of any use. Test calls must be conducted to cause the collection of this data. System initialization or recovery will clear all transmission test data. ATMS measurements are stored only in memory and are not backed up onto a mass storage device. If for any reason the switch loses its current memory contents, the measurements will be lost. Trunks which have no transmission test data appear on the report as a blank line after the trunk member number.

mark port

This command marks a port as unusable.

SYNOPSIS

mark port location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

mark port 1c0208
mark port 2a1001

DESCRIPTION

The mark port command is used to mark a faulty port as defective to prevent the use of the port in other administrative operations (for example, adding a data-module or station). Ports on any type of circuit pack may be marked except for circuit packs that are administered automatically (for example, Tone Detector, Tone Generator, Announcement, Speech Synthesizer, Call Classifier and Maintenance/Test circuit packs) when the circuit pack is installed. When the mark port command is entered, the specified port is marked. If the port can be administered manually, and if the port is not assigned, then the port is marked as faulty. The port can be restored to service by using the clear port command. All marked ports can be displayed in a list format via the list marked-ports command. All marked port information is saved as part of translations.

Defaults

No defaults.

Parameters

location	A "location" represents the physical position of the port to be marked and is entered as "UUcSSpp" where "UU" represents the cabinet number, "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit (port). A single digit cabinet (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses help after entering "mark port" the following message will be displayed:

```
Enter 7 character port number
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy, try again later
```

OUTPUT

If the mark port command is successful the following message will be displayed on the SAT:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

monitor bcms

This command displays real-time status reports for agents and splits summarizing BCMS (basic call management systems).

SYNOPSIS

monitor bcms [split *split number* | system *system number* | skill *skill number*]

PERMISSIONS

The following default logins may execute this command: init, inads, system technician, cust, rcust, bcms, browse.

EXAMPLES

monitor bcms split 1
monitor bcms system 1 5 7 8 9
monitor bcms system 1-15
monitor bcms skill 1

DESCRIPTION

The monitor bcms command displays output for agents and splits summarizing the bcms condition. This on-line status report is automatically updated every 30 seconds (or by pressing the UPDATE key) until the command is canceled by pressing the CANCEL key. Three display options are available: skill, split, and system.

Defaults

No defaults.

Parameters

split	This specifies that the command display status information for a specified split number (an ACD hunt group).
split number	The split's identity to the switch and BCMS; an ACD hunt group number (split number). This parameter is entered only when the "split" parameter is entered.
system	This specifies that the command display split queue status as well as cumulative split information for all the BCMS measured splits.

system number	ACD hunt group numbers (split numbers) separated by spaces and/or split number ranges separated by a hyphen ("-").
skill	This specifies that the command display status information for a specified skill number.
skill number	The skill's identity to the switch and BCMS; an ACD hunt group number (skill number). This parameter is entered only when the "skill" parameter is entered.

Help Messages

If the system technician presses HELP after entering "monitor bcms", the following object command word choices will be displayed:

```
Please enter one of the following object command words:
          skill         split          system
         Or press CANCEL to cancel the command
```

If the system technician presses HELP after entering "monitor bcms system" the following message will be displayed:

```
Enter [measured split numbers separated by one space
and/or split range in the format xx-xx], ['print']
       Or press CANCEL to cancel the command
```

If the system technician presses HELP after entering command "monitor bcms split" or "monitor bcms skill" the following message will be displayed:

```
Enter a measured split or skill number(1-99), ['print']
         Or press CANCEL to cancel the command
```

Error Messages

If the split or skill number entered is non numeric, not administered, or invalid in any other way, the following message is displayed:

```
Invalid split number
```

If the split or skill number entered is not measured by BCMS or only measured externally, the following message is displayed:

```
Split is not measured by Basic Call Management System (BCMS)
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following output fields are for the "monitor bcms system" command

Date:	The current date and time which is updated every 30 seconds or when the UPDATE key is pressed.
SPLIT	The name of the split being reported, if no name is administered then the split extension is displayed in the form "EXTxxxxx". Splits are displayed in split number order. This field is translation data.
CALLS WAIT	The number of calls currently waiting in this split's queue. If any of these calls are Direct Agent Calls, the field will be preceded by an asterisk. This field is real-time status data.
OLDEST CALL	The amount of time that the oldest call has waited in queue. This field is real-time status data.
AVG ANSW SPEED	The average speed of answer for this split during the current period. This includes time in queue and time ringing at the agent's voice terminal. Calls that intraflow (calls that overflow from one ACD split to another split) will not have queue time from previous splits included in the average. The calculation is Total Answer Time/Total Automatic Call Distribution (ACD) Calls. This field is measurement data and includes only those calls that have completed (terminated).
AVAIL AGENT	The number of agents in this split currently available to receive an Automatic Call Distribution (ACD) call from this split. This field is real-time status data.
# ABAND	The number of calls that have abandoned during the current period. This field is measurement data.
AVG ABAND TIME	The average time abandoned calls waited in queue before abandoning during the current period. The calculation is Total Abandon Time/Total Calls Abandoned. This field is measurement data and includes only those calls that have completed (terminated).

# ACD	The number of Automatic Call Distribution (ACD) calls handled by this split during the current period. This includes calls that intraflow into the split. This field is measurement data.
AVG TALK	The average talk time for Automatic Call Distribution (ACD) calls handled by this split during the current period. This does not include ring time at the agents' voice terminal. The calculation is Total ACD Talk Time/Number of ACD Calls. This field is measurement data and includes only those calls that have completed (terminated).
AVG AFTER CALL	The average After Call Work (ACW) time for Automatic Call Distribution (ACD) calls handled by this split during the current period. ACD calls with no ACW time are included in the average. Time spent on direct incoming or outgoing calls while in ACW will not be included in the average. The calculation is (Total ACW Time - Total ACW Incoming Time - Total ACW Outgoing Time)/Total ACD Calls. This field is measurement data and includes only those calls that have completed (terminated).

The following display was produced by entering the "monitor bcms system" command.

```
monitor bcms system                               Page   1 of   1

                          BCMS SYSTEM STATUS

                       Date:   14:02 THU OCT 17 1991

                          AVG                         AVG                     AVG
          CALLS  OLDEST   ANSW  AVAIL   #      ABAND    #    AVG    AFTER
SPLIT      WAIT   CALL   SPEED  AGENT  ABAND    TIME   ACD   TALK    CALL
Service       3   1:03     :45    0      3       :30    20    2:30   1:25
Sales         5    :33     :15    0     11       :45    36    1:32    :35
```

The following output fields are for the "monitor bcms split" command:

Split:	The number of the split requested. This field is translation data.
Split Name:	The name of the split requested. If no name exists the split extension is displayed in the form "EXT xxxxx". This field is translation data.
Date:	The current date and time which is updated every 30 seconds or when the UPDATE key is pressed.
Calls Waiting:	The number of calls currently waiting in this split's queue. If any of these calls are Direct Agent Calls, the field will be preceded by an asterisk. This field is real-time status data.
Oldest Call:	The time in minutes:seconds that the current oldest call has waited in this split's queue. This field is real-time status data.
Staffed	The number of agents currently logged into this split. This field is real-time status data.
Avail	The number of agents currently available to receive an Automatic Call Distribution (ACD) call in this split. Agents are in either the Auto-in or Manual-in work modes and are not currently on a call. If the agent is on another split's call or in After Call Work (ACW) for another split, this agent is not considered available and will not be recorded here. This field is real-time status data.
ACD	The number of agents in this split currently on an Automatic Call Distribution (ACD) call for this split. This includes ACD calls that are being handled by this split that arrive as coverage from another split. This field also includes outbound calls (Outgoing Call Manager) that are distributed through the ACD. Note that if an agent puts an ACD call on hold, but does not enter another state (for example, the agent does not enter the AVAIL state), the agent will still be seen as in the ACD state. This field is real-time status data.
ACW	The number of agents in this split currently in After Call Work (ACW) for this split. This field is real-time status data.

AUX	The number of agents in this split currently in AUX work for this split. If an agent is on another split's call or in After Call Work (ACW) for another split, this agent is not considered in AUX work and will not be recorded here. This field is real-time status data.
Extn	The number of agents in this split currently on non-ACD (Automatic Call Distribution) calls, either incoming or outgoing directly to or from their extensions. If the agents are also in After Call Work (ACW) or AUX they will be recorded as Extn rather than ACW or AUX. This field is real-time status data.
OtherSplit	The number of agents in this split on another split's call or in After Call Work (ACW) for another split. Only used if agents belong to multiple splits. This field is real-time status data.
AGENT	The name of the agent associated with the extension. If no name exists this field will be left blank. This field is translation data.
EXT	The extension of the agent. This field is translation data.
STATE	The current state of the agent for this split. This possible states are Avail, ACD, ACW, AUX, Extn In, Extn Out, OtherSplit, and Unstaff. If an agent is staffed, the agent must also be in one of the above states. This field is real-time status data.
TIME	The clock time that the agent entered the current state in hours:minutes. This field is real-time status data.
ACD CALLS	The number of Automatic Call Distribution (ACD) calls (inbound and outbound), that the agent has completed for this split during the current period (half hour or hour). The maximum number of calls is 255, and if this maximum is exceeded, 255 is displayed. This field is measurement data.
EXTN IN CALLS	The number of non-ACD (Automatic Call Distribution) calls that the agent has received (incoming) and completed during the current period. The maximum number of calls is 255, and if this maximum is exceeded, 255 is displayed. This field is measurement data.
EXTN OUT CALLS	The number of non-ACD (Automatic Call Distribution) calls that the agent has made (outgoing) and completed during the current period. The maximum number of calls is 255, and if this maximum is exceeded, 255 is displayed. This field is measurement data.

The following display was produced by entering "monitor bcms split 1".

```
monitor bcms split 1                   Page   1 of   1   SPE A


            BCMS SPLIT (AGENT) STATUS

     Split: 1
    Split Name: hunt group 1          Date:   9:02 TUE OCT 22 1991
 Calls Waiting:  0
   Oldest Call: 0:00
   0=Staffed   0=Avail   0=ACD   0=ACW   0=AUX   0=Extn    0=OtherSplit
 AGENT        EXT    STATE    TIME     ACD   EXTN IN  EXTN OUT
                                      CALLS   CALLS     CALLS
```

FEATURE INTERACTIONS

None.

monitor health

This command displays one screen page of output summarizing the overall condition of the system.

SYNOPSIS

monitor health

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms, browse.

EXAMPLES

monitor health

DESCRIPTION

The monitor health command displays the current system alarm summary, maintenance busy summary, user summary, critical system status, and cabinet status, all of which is updated every minute.

The user is logged off of the system after this command is terminated.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "monitor health" the following message will be displayed:

```
Entry is not required
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Major	The number of logged major alarms is displayed as a number ranging from 0 to 200. Up to 200 major alarms can be reported in the alarm log; therefore, this is the maximum which can be displayed.
Minor	The number of logged minor alarms is displayed as a number ranging from 0 to 200. Up to 200 minor alarms can be reported in the alarm log; therefore, this is the maximum which can be displayed.
Warning	The number of warnings logged in the alarm file is displayed as a value between 0 and 200, which is the maximum number of warnings permitted.
Trunks	The number of maintenance busied out trunks is shown.
Stations	The number of maintenance busied out stations is displayed.
Others	The combined number of maintenance busied out objects excluding trunks and stations is displayed.
Static	Static indicates the proportion of the CPU which is currently dedicated to high priority items (e.g. the operating system). This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (e.g. an occupancy of 89.6% would be displayed as 90%).
SM	SM indicates the proportion of the CPU which is currently dedicated to system management or periodic and scheduled maintenance. Therefore, if there is a large amount of periodic or scheduled maintenance testing being performed, this occupancy percentage can be high without affecting service. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (e.g. an occupancy of 89.6% would be displayed as 90%).

CP	CP indicates the proportion of the CPU which is currently dedicated to call processing. This occupancy has priority over SM and IDLE occupancy categories and if needed, will take processor time away from these occupancy categories. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (e.g. an occupancy of 89.6% would be displayed as 90%).
Idle	Idle indicates the proportion of the CPU which is currently available for use. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (e.g. an occupancy of 89.6% would be displayed as 90%).
Active SPE	A or B is displayed to indicate the currently active processor complex. When the active processor complex is locked on-line via lock switching on DUPINT, the "lock" option will be displayed; otherwise, "auto" will be shown.
Duplicated?	The duplication status of the SPE component is indicated. "y" indicates duplication and "n" indicates no duplication.
SPE Power	The current source of power for the processor complex is indicated. The normal state is "commercial". When commercial power is not available, battery backup is in use and will be indicated by "backup".
Time Source	The current timing source is displayed. The display values for this field vary according to the timing source selected. If the site has administered the optional Stratum-3 hardware, "external" will be displayed under normal operating conditions and "internal" will be displayed when an internal source, such as a tone clock, is used. Primary and secondary timing sources must be administered when using the Stratum-4 option. "primary" is displayed when the primary administered source is in use, and "secondary" is displayed when the administered secondary source is in use. When neither the primary or secondary sources are in use, "local" will be displayed.
# Logins	The number of current users is displayed.
Cab	The assigned cabinet number, ranging from 1 to the highest cabinet number in the system, is displayed on the screen.

Emerg Trans	The current setting of the emergency transfer switch on the maintenance board is indicated for each cabinet. Five options are available: auto-on ("auto+" or "a+"), auto-off ("auto-" or "a-"), "on", "off", and "n.a.". Normally, the "auto+" or "auto-" option is enabled. In this state, emergency transfer will be activated automatically upon cabinet failure (The "+" indicates that emergency transfer is currently activated, while the "-" indicates that emergency transfer is currently not activated). When "on" is displayed, emergency transfer is automatically activated. The "off" option shows that the cabinet is prevented from activating emergency transfer. In a system equipped with duplicated SPEs, the switch settings for both processors of the PPN (cabinet 1) will be displayed. In this case, "auto+" will be abbreviated "a+", "auto-" will be abbreviated "a-", and "off" will be abbreviated as "of". "on" will not be changed. If "n.a." is displayed, the emergency transfer switch setting is not available.
Mj	The individual number of major alarms associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
Mn	The individual number of minor alarms associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
Wn	The individual number of associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
PNC	Current Port Network Connectivity (PNC) status for each of the port networks within a cabinet is displayed. When multiple port networks exist within a cabinet, Carriers A, B, and C are listed first and separated from Carriers D and E by a slash (e.g. up/up). PNC status of a port network is determined on the basis of availability of the Expansion Archangel Link (EAL). An "up" denotes that the EAL is available. When the EAL is not available, then a "dn" (down) is displayed.
Time of Day	The current time of day acquired from the system is displayed.

The following display was produced by entering "monitor system health".

```
status health

 ALARM SUMMARY                  CABINET STATUS
      Major:  0
      Minor:  9                Emerg  Alarms
    Warning:  4            Cab Trans Mj Mn Wn PNC
                            1   off   0| 7| 0 up
 BUSY-OUT SUMMARY           2   off   0| 0| 4 up
     Trunks:  0             3   n.a.  0| 2| 0 up
   Stations:  0             4   off   0| 0| 0 up/up
     Others:  0
 PROCESSOR OCCUPANCY STATUS
 Static:   3%     SM:   6%
     CP:  10%   Idle:  81%
 CRITICAL SYSTEM STATUS
   Active SPE: A/auto
   Duplicated? SPE:n
    SPE Power: commercial
  Time Source: external                   9:33 TUE JAN 29 1991
     # Logins: 2       - Press CANCEL to quit -
```

FEATURE INTERACTIONS

In a High or Critical Reliability System, if the standby SPE Emergency Transfer Select Switch is changed and handshake is down, the displayed Emerg Trans field will be incorrect until handshake comes up again.

The user is logged off of the system when the monitor health command is terminated.

monitor security-violations

This command provides an audit trail of security infractions

SYNOPSIS

monitor security-violations *print*

PERMISSIONS

The following default logins may execute this command: init, inads, system technician, cust, rcust, bcms, browse.

EXAMPLES

monitor security-violations
monitor security-violations print

DESCRIPTION

The monitor security-violations command displays information about failed attempts to access the system. The time of the violation, the login entered, and the port accessed during the failed login attempt are logged. Also, the trunk group number, member, and extension will be logged for remote access violations. Remote and local invalid access attempts are logged with a total of 16 entries maintained for each access type. This on-line status report is automatically updated every 30 seconds until the command is canceled by pressing the CANCEL key.

Defaults

No defaults.

Parameters

print   This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "monitor security-violations", the following message is displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following output fields are for the "monitor security-violations" command

SYSTEM MANAGEMENT VIOLATIONS

Date:	The current date and time.
Date	The date of the logged security violation given as MM/DD where MM is the month and DD is the day of the invalid access attempt.
Time	The time of the logged security violation given as HH:MM where HH is the hour and MM is the minute of the invalid access attempt.
Login	This is the login ID that was entered as part of the login violation attempt.
Port	This is the type of port from which the login violation was attempted. The following is a table of the valid port types:

Port Type	Description
MGR1	This represents a connection to one of the system SAT ports. This can be accomplished either by a hard-wired EIA connection or by a dial-up connection.

Ext	The extension assigned to the data module the failed "logging in" session was attempted on. If a data module was not used as, for example, in the case of dedicated EIA connections, then this field will be blank.

REMOTE ACCESS VIOLATIONS

Date	The date of the logged security violation given as MM/DD where MM is the month and DD is the day of the invalid access attempt.
Time	The time of the logged security violation given as HH:MM where HH is the hour and MM is the minute of the invalid access attempt.
TG No.	The trunk group number associated with the trunk from which the remote access attempt terminated (remote access violations only).
Mbr	The trunk group member number associated with the trunk from which the remote access attempt terminated (remote access violations only).
Ext	The extension used to interface with the remote access feature (remote access violations only).

The following display was produced by entering "monitor security-violations".

```
monitor security-violations                        SPE A

                     SECURITY VIOLATIONS STATUS

                        Date:   9:12 MON DEC 30 1991

   SYSTEM MANAGEMENT VIOLATIONS        REMOTE ACCESS VIOLATIONS

  Date   Time  Login  Port    Ext    Date   Time   TG No.   Mbr  Ext
  12/30  09:12 init   MGR1           12/30  12:42  80        1   1111
  12/30  09:12 init   MGR1
  12/30  09:12 init   MGR1
```

FEATURE INTERACTIONS

None.

monitor system

This command with the view1 or view2 option displays one screen page of output summarizing the overall condition of the system. With the connection option, the command displays the real-time status for time slots and buses. Additionally, there are other miscellaneous parameters displayed that show call rates, intervals, etc.

SYNOPSIS

monitor system [view1 | view2 | conn [pnn *pnn number 1 pnn number 2 pnn number 3*]]

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms, browse.

EXAMPLES

monitor system view1
monitor system view2
monitor system conn
monitor system conn pnn 1 5 7

DESCRIPTION

The monitor system view1 and view2 commands display a page of output summarizing the condition of the system. This on-line status report is automatically updated until the command is canceled by pressing the CANCEL key. Two display options are available: view1 and view2.

The current overall system status is available with either of the view options. "View1" displays attendant, maintenance, and traffic status. Attendant and maintenance status are updated every minute and traffic status is updated on an hourly basis. When the command is canceled, the technician will be automatically logged off for security reasons. The "view2" report contains everything the "view1" report does, except the hunt group measurements are omitted from the traffic status portion of the "view2" report. These forms contain simplified high-level information from which a basic picture of the system’s health can be drawn. The monitor system conn command displays output that shows the status of connections in the connection manager process. Data is collected frequently in the connection manager for certain key information items. It is from this database that this report is drawn. This on-line status report is automatically updated every minute (or by pressing the UPDATE key) until the command is canceled by pressing the CANCEL key. Pressing the CANCEL keys forces a logout of the current login id.

There is one option to the command line entry, monitor system conn. That parameter is *pnn*. On the *gaz target*, there are only 3 possible pnns. On the *mips target*, however, up to 22 pnn can be administered. The command line parameter *pnn* is used to indicate which 3 pnns the user wishes to see.

Defaults

No defaults.

Parameters

view1	This specifies a form that will include the attendant status, the maintenance status, the last hour's measurement of trunk groups, hunt groups, and the attendant group, and finally, the time of day.
view2	This specifies a form that will display a subset of the view1 form entries. This form will include all of the view1 form except the last hour's hunt group measurements.
conn	This option will bring up the connection monitor output for key information.
entering no options	Omitting the "pnn # # #" argument on the command line will cause the default configuration of Pnn's 1, 2 and 3 to be displayed.
pnn # # #	Entering "pnn # # #", where "#" is replaced by a pnn number from 1 to 3, will cause data for the specified pnns to be displayed.

entering no options	Omitting the "pnn # # #" argument on the command line will cause the default configuration of Pnn's 1, 2 and 3 to be displayed.
pnn # # #	Entering "pnn # # #", where "#" is replaced by a pnn number from 1 to 3, will cause data for the specified pnns to be displayed.

Help Messages

If the system technician presses HELP after entering "monitor system", the following object command word choices will be displayed:

```
conn        view1       view2
              scr
```

If the system technician presses HELP after entering "monitor system conn" the following message will be displayed:

```
Enter 3 port network numbers(xx-xx) ['pnn' x x x]
```

Error Messages

If the pnn number entered is non numeric, not administered, or invalid in any other way, one of following messages will be displayed:

```
Object command word omitted; please press HELP
"xx" is an invalid identifier; press RETURN to execute modified command
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following output fields are for the "monitor system view1" and "monitor system view2" commands.

Console #	A list of console numbers that are either activated or deactivated.
Activated:	The attendant console is in service. An attendant console is considered activated if its handset/headset is plugged in, it is not busied out, and the system is in day service and the console is a day or day/night or principle console, or the system is in night service and the console is a night or day/night console.
Deactivated:	The attendant console is not in service. The attendant console is considered deactivated if it does not meet the previous activated conditions.
# of alarms for trunks	The total number of existing minor and major alarms on trunk ports.
# of alarms for other resources	The total number of existing minor and major alarms on all maintainable objects in the system except trunks and stations.

First OSS number has been informed?	Have all the alarms been reported and acknowledged by the first OSS telephone number. If the "Alarm Origination" is not enable or there are no active alarm, the field will be "n".
Measurement Hour	The starting time of the period for which the measurement was taken. For example, if the measurement hour is shown as 1800, it means the traffic status data displayed is for the time period from 6 PM to 7 PM (The measurement is taken on an hourly basis).
Grp no	A number between 1 and the maximum trunk group number or maximum hunt group number in the system.
Grp dir	Group direction: incoming, outgoing or two way.
Calls qued	Total calls that arrived and were placed in the queue for trunk groups.
Calls aban	Total calls that were abandoned by the caller.
%Out blkg:	The ratio of outgoing calls that are not carried (due to overload conditions) on a trunk group to the outgoing calls offered.
% Time ATB:	The percentage of time within the polling interval that all trunks in the trunk group were unavailable for use.
Time of day	The current time of day acquired from the system.

For the following output example, the command monitor system view1 was entered.

```
monitor system view1
                 ATTENDANT STATUS                  MAINTENANCE STATUS

                   Console no.                     # of alarms for trunks: 4
  Activated: 1 2 3 4 5 6                         # of alarms for stations: 2
                                                # of alarms for other res: 1
Deactivated: 7 8                       First OSS number has been informed? n


                               TRAFFIC STATUS
                             Measurement Hour: 1800
            Trunk Group Measurement                Hunt groups Measurement
(4 grps with highest %time ATB)          (4 grps with highest # of qued calls)
    Grp no: 78                                  Grp no: 16
   Grp dir:                                 Calls qued: 2
Calls qued: 1                               Calls aban: 1
 %Out blkg:                                       Attendant Group Measurement
 %Time ATB:                                 Calls qued: 1     Calls aban: 0

                                                    16:06 WED MAR 6 1996
                 - press CANCEL to quit -
```

For the following output example, the command monitor system view2 was entered.

```
monitor system view2
                 ATTENDANT STATUS                  MAINTENANCE STATUS

                   Console no.                     # of alarms for trunks: 4
  Activated: 1 2 3 4 5 6                         # of alarms for stations: 2
                                                # of alarms for other res: 1
Deactivated: 7 8                       First OSS number has been informed? n


TRAFFIC STATUS  Measurement Hour: 1800
          Trunk Group Measurement
(4 grps with highest %time ATB)
    Grp no: 78
   Grp dir:
Calls qued: 1
 %Out blkg:
 %Time ATB:
          Attendant Group Measurement
Calls qued: 1     Calls aban: 0
                                                    16:08 WED MAR 6 1996
                 - press CANCEL to quit -
```

OUTPUT

The following output fields are for the "monitor system conn" command.

Time Slot Status	There are 4 numbers associated with the time slot status for each specified pnn; for each of the two buses (0 and 1) there is a maintenance and a normal state. The first row is the pnn, the second specifies the bus while the third specifies the bus's state while the last column represents the number of idle counts. These fields represent real-time status data.
Bus Status	For the bus status fields, there are two numbers associated with each of the two buses for each pnn. Shown are the pnn number; the bus associated with it, i.e., 0 or 1; and the state of the bus, i.e., "avail" or "unavail". These fields represent real-time status data.
Callrate	The callrate field represents the call rate being experienced currently on the switch. This is a counter which is bumped each time a call attempt is made. This field represents real-time status data.

Interval	This field is related to the above field in that it represents the interval being applied with which the call rate is applicable. It is normally set to a 36 second time period. This field represents a constant status data.
Max_callrate	This field represents the maximum call rate which has been hit during the time since the last hour has passed. If, for example, at 20 minutes past 12:00 this command is executed, this field will represent the maximum call rate obtained during the past 20 minutes. This field represents real-time status data.
Next_hour	This field will contain a value of 0 or 1 depending upon if the measurements being taken are for this hour or the next. It is related to the previous field in that the maximum call rate is reflected for this hour. When this flag is set, then statistics begin to accumulate for the next hour and shortly thereafter, the maximum call rate will become zero and accumulations will begin anew.
tot_ts_req	This field holds the total time slots in use during the time period elapsed since the top of the last hour. Data is internally collected every 100 seconds. When the timer fires and the data collection occurs, a check is made as to how many time slots are currently in use. That's where the total comes from. There are three numbers displayed for this field on the form; one for each of the pnns requested. This field represents real-time status data.
ts_denied	This field holds the total time slots requests that were denied during the time period elapsed since the top of the last hour. Data is internally collected every 100 seconds. There are three numbers displayed for this field on the form; one for each of the pnns requested. This field represents real-time status data.
tot_fts_req	This field represents the total fiber time slots that have been requested. This field is incremented each time a fiber time slots that have been allocated since the last top of the hour measurements polling. There are three values shown on the form; one for each of the requested pnns. This field represents real-time status data.
ts_count	This field indicates how many time slots are in use during the last 100 second poling period. An internal timer causing polling to occur every 100 seconds. The value in this field represents the requests for time slots during that 100 second interim. There are three numbers displayed for this field on the form; one for each of the pnns requested. This field represents real-time status data.

ts_total	This field gets it's value from the time slots count field discussed above every 100 seconds. It represents the total number of time slots requested since the top of the last hour and is real-time status data.
fts_count	This field indicates how many fiber time slots are in use during the last 100 second poling period. An internal timer causing polling to occur every 100 seconds. The value in this field represents the requests for fiber time slots during that 100 second interim. There are three numbers displayed for this field on the form; one for each of the pnns requested. This field represents real-time status data.
fts_total	This field indicates the total number of fiber time slots. This field gets it's value from the fiber time slots count field discussed above every 100 seconds. It represents the total number of fiber time slots requested since the top of the last hour and is real-time status data.
Requests-TN748 TTRs	The total number of touch tone receivers requested is reflected in this field. It is a running count of currently active requests. It is decremented when a tone receiver is freed and incremented when they are requested. Note that this field applies strictly to the TN748 board. This field represents real-time status data.
Requests-TN748 CPTRs	The total number of call progress tone receivers requested is reflected in this field. It is a running count of currently active requests. It is decremented when a call progress tone receiver is freed and incremented when they are requested. Note that this field applies strictly to the TN748 board. This field represents real-time status data.
Requests-TN744 CPTRs	The total number of call progress tone receivers requested is reflected in this field. It is a running count of currently active requests. It is decremented when a call progress tone receiver is freed and incremented when they are requested. Note that this field applies strictly to the TN744 board. This field represents real-time status data.
Requests-TN744 TTRs	The total number of touch tone receivers requested is reflected in this field. It is a running count of currently active requests. It is decremented when a tone receiver is freed and incremented when they are requested. Note that this field applies strictly to the TN744 board. This field represents real-time status data.
Requests-TN744 MFC	The total number of multi-frequency receivers requested is reflected in this field. It is a running count of currently active requests. It is decremented when a multi-frequency receiver is freed and incremented when they are requested. Note that this field applies strictly to the TN744 board. This field represents real-time status data.

The following display was produced by entering "monitor system conn".

```
       Time Slot Status                  Bus Status
Pnn     Bus   State  *Idle Count   Pnn  Bus  State
 10       0   Maint     0           10    0  Avail
 10       1   Normal    233         10    1  Avail
 10       0   Maint     0           22    0  Avail
 10       1   Normal    233         22    1  Avail
 22       0   Maint     0            1    0  Avail
 22       1   Normal    233          1    1  Avail
 22       0   Maint     0
 22       1   Normal    233        *Callrate:  20
  1       0   Maint     0          *Interval:  60
  1       1   Normal    233      *Max_callrate:45
  1       0   Maint     0         *Next_hour:  70
  1       1   Normal    233
 tot_ts_req :0F24 0000 3CE2 ts_count :0010 0920 0200 Requests-TN748 TTRs :0014
 ts_denied  :0E46 3CE2 0000 ts_total :0000 0090 0028 Requests-TN748 CPTRs:0041
 tot_fts_req:0000 53D2 2231 fts_count:02E0 0910 0784 Requests-TN744 CPTRs:0082
                            fts_total:0320 0192 7048 Requests-TN744 TTRs :0082
                            Requests-TN744 MFCs :0082
Note: * Denotes Base 10, All Other Figures are in Base 16
```

FEATURE INTERACTIONS

None.

monitor traffic

This command monitors the traffic load for trunk or hunt groups.

SYNOPSIS

monitor traffic [trunk-groups *number* | hunt-groups]

PERMISSIONS

The following default logins may execute this command: init, inads, system technician, cust, rcust, bcms, browse.

EXAMPLES

monitor traffic trunk-groups
monitor traffic trunk-groups 4
monitor traffic hunt-groups

DESCRIPTION

The monitor traffic command gives an instant picture of the load on various trunk and hunt groups in terms of number of calls waiting to be serviced, and the time the oldest call in the group has been awaiting service.

Defaults

No defaults.

Parameters

trunk-groups	The trunk group report displays the number of calls in the queue waiting to be serviced, for each trunk group. The number of the members in the group and the number of members which are active on calls in the group are also displayed for comparative analysis. Only the administered trunk groups are displayed, up to a maximum of 60 groups. The user may specify the starting trunk group. For example, if the user entered 5, then the trunks displayed would be from group 5 and up, 1-4 would not be displayed.
hunt-groups	The hunt-group report has a similar format as the trunk-group report. In addition to the trunk-group information, this report displays the time the oldest call has been waiting in the queue for each hunt group. The data on the screen is updated every minute, only the fields whose values have changed are refreshed. All the hunt groups, whether administered or not, are displayed. The hunt groups that are not administered have blank values.

Help Messages

If the system technician presses HELP after entering "monitor traffic", the following object command word choices will be displayed:

```
hunt-groups         trunk-groups
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

#	Group number for the trunk or hunt group.
S	The size (number of members administered) of each trunk or hunt group.
A	The number of members in a group that are active on a call. This does not include members which have been busied out.

Q The length of the queue administered for a group.

W The number of calls waiting in the group queue to be serviced.

LCIQ The longest call in queue (LCIQ) indicates the time in seconds the oldest call in the hunt group queue has been waiting to be serviced.

For the following output example, the command "monitor traffic hunt-groups" was entered.

```
monitor traffic hunt-groups

                 HUNT GROUP STATUS   22:49 SAT DEC 31 1988
      #   S   A   Q   W   LCIQ       #   S  A   Q   W  LCIQ
      1   15  10  10  0   20         17
      2                              18
      3                              19
      4                              20
      5                              21
      6                              22
      7                              23
      8                              24  10   5   0   0   10
      9                              25
      10                             26
      11                             27
      12                             28
      13                             29
      14                             30
      15                             31
      16                             32

 (#: Group;  S: Grp Size;  A: Active Members;  Q: Q Length;  W: Calls Waiting)

 (LCIQ: Longest Call In Queue in seconds)
```

For the following output example, the command monitor traffic trunk-groups was entered.

```
monitor traffic trunk-groups

                 TRUNK GROUP STATUS   22:49 SAT DEC 311988
   #  S  A  Q  W  #  S  A  Q  W  #  S  A  Q  W  #  S  A  Q  W
   1  15 10 0  0
   2  22 21 10 10
   9  31 12 20 0
   65 5  5  10 8
   99 12 0  0  0

 (#: Group;  S: Grp Size;  A: Active Members;  Q: Q Length;  W: Calls Waiting)
```

FEATURE INTERACTIONS

None.

monitor trunk

This command monitors the status of an individual trunk group member.

SYNOPSIS

monitor trunk group*/member*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

monitor trunk 78
monitor trunk 80/
monitor trunk 78/1
monitor trunk 80/2

DESCRIPTION

The monitor trunk command displays internal software state information for diagnosis. This command can help locate facilities to which the trunk is communicating.

If a trunk group number is entered without a member number, with or without the "/", it is assumed to be the member 1. If a trunk group number and member number are both entered, status for the specified member is displayed.

Defaults

The member number defaults to 1 if a group is specified without a member.

Parameters

group	The group number is an administered number associated with each trunk group. The valid range is 1 - 99. If a group number is entered without a member number, member number defaults to 1.
member	The member number is an administered number identifying a particular member within a trunk group. The valid range is 1 - 99. If a member number is entered, status for that member is displayed.

Help Messages

If the system technician presses HELP after entering "monitor trunk", the following message is displayed:

```
Enter assigned trunk group(1-99) or [group/member(1-99)]
```

Error Messages

If the format of the trunk identifier is incorrect, the following error message is displayed:

```
Format invalid
```

If the trunk identifier is not in the valid range, the following error message is displayed:

```
Trunk or trunk group invalid
```

If the trunk group member is not administered, the following message is displayed:

```
Group member not assigned
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Trunk Group/Member	The trunk group number and group member number. Valid identifiers are 1-99/1-99.
Port	The port location (cabinet-carrier-slot-circuit) of the trunk.
Signaling Group ID	If the trunk is of type ISDN, then this field contains the number of the ISDN Signaling Group to which this group belongs. Otherwise, this field is blank.
Connected Ports	Port locations (cabinet-carrier-slot-circuit) connected to the trunk.

Service State	Whether the trunk is in service or out of service. One of the following states is displayed: in-service/active, in-service/idle, out-of-service, out-of-service-NE (Near End), out-of-service-FE (Far End), maint-NE/active, maint-FE/active, maint-NE/idle, maint-FE/idle, pending-in-service, pending-maint, or disconnected. NE (Near End) and FE (Far End) refer to which "end" of the trunk has placed the facility in the state that it is in.
Maintenance Busy	Whether there is any maintenance testing being performed upon the trunk.
CA-TSC State	The state of the temporary signaling connection. A temporary signaling connection is a connection set up to pass call information over PRI signaling links.

For the following output example, the command that was entered is "monitor trunk 78/1".

```
monitor trunk 78/1

                              TRUNK STATUS

 Trunk Group/Member: 078/001           Service State: in-service/idle
              Port: 01C1505        Maintenance Busy? no
 Signaling Group ID:                       CA-TSC State:
    Connected Ports:
```

FEATURE INTERACTIONS

None.

recycle carrier

This command recycles power on a carrier.

SYNOPSIS

recycle carrier location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

recycle carrier c
recycle carrier 01c
recycle carrier 2b
recycle carrier 3d

DESCRIPTION

The recycle carrier command recycles power on a specific carrier. When a power unit is replaced in a carrier, this command must be entered to recycle the power on that carrier. **The processor carrier and its duplicate if present as well as any EPN control carrier or an SCC carrier cannot be recycled. If a port carrier is recycled, service is interrupted for that port carrier. If a carrier containing an active EI is recycled, communications with that cabinet will be disrupted. If a carrier containing an active tone-clock board is recycled, all ports in port network will have service disrupted.** For more details on recycling and trouble shooting power units, refer to "Troubleshooting Control Carrier Power Units" in Chapter 5, "Routine Maintenance Procedures".

Defaults

The default cabinet is cabinet 1. There is no default carrier.

Parameters

location	The location designates the physical location of the desired carrier. The location consists of the cabinet number and a carrier letter. The cabinet number is one or two digits from 1 to 3 with leading zeros allowed. Cabinet 1 is the PPN with 2-3 referring to some optional EPN cabinet. The carrier letter may be "b" through "e". The "b" carrier may not be specified for SPE duplex PPNs.

Help Messages

If the system technician presses HELP after entering "recycle carrier" on a simplex SPE system, the following message will be displayed:

```
Enter [cabinet(1-3)];carrier(B-E)
```

If the system technician presses HELP after entering "recycle carrier" on a duplex SPE system, the following message will be displayed:

```
For cabinet 1 enter [cabinet(1)];carrier(C-E)
For cabinet 2-3 enter cabinet (2-3);carrier(B-E)
```

Error Messages

If no location is entered, the following message will be displayed:

```
Identifier command word(s) omitted; please press help
```

If a location greater than three characters is entered, the following message will be displayed:

```
Entry invalid
```

If the location entered is longer than 3 characters or less than 1 character the following will be displayed:

```
Invalid carrier specified
```

If the cabinet and carrier specified are in an EPN that is not available, the following message will be displayed:

```
EPN is not available
```

If a cabinet number of "1" or "01" is entered and the carrier specified is "A" or "B" in an SPE duplex system, the carrier specified is "A" in a SPE simplex system or if the "A" carrier is specified with a cabinet other than "1" or "01, or an SCC carrier location is given," the following message will be displayed:

```
Cannot recycle control carriers or XE carriers
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
login id':'command' has a command conflict
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) of the maintenance object that is being tested. For this maintenance object, only the cabinet and carrier values are displayed.
Maintenance Name	The maintenance name will always be CARR-POW.
Alt. Name	Not applicable.
Test Number	The test number will always be 126.
Test Result	An indicator as to whether the test passed, failed, or was aborted.
Error Code	Further detail about the results of the test.

For the following output example, the command recycle carrier c was entered.

```
recycle carrier c

                           TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  01C     CARR-POW                     126      PASS

Command successfully completed
```

FEATURE INTERACTIONS

The 'a' carrier can never have its power recycled. When the 'b' carrier of the PPN contains SPE duplication hardware, the 'b' carrier similarly is not available for power recycling.

If a port carrier is recycled, service is interrupted for that port carrier. If a carrier containing an active EI is recycled, communications with that cabinet will be disrupted. If a carrier containing an active tone-clock board is recycled, all ports port network will have service disrupted.

Occasionally, circuit packs show red LEDs and "NO BOARD" when a list configuration command is issued after a carrier is recycled. The test tdm command can be used to accelerate retirement of these problems.

refresh spe-standby

This command refreshes the memory of the standby SPE in a High or Critical Reliability System.

SYNOPSIS

refresh spe-standby

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

refresh spe-standby

DESCRIPTION

The refresh spe-standby command is used to immediately put the Standby SPE into Standby Mode. The command conducts the same activities regardless of whether the Standby SPE is already in Standby or Maintenance Mode. When this command is issued, any Standby SPE maintenance activity that is currently is progress is preempted, the Standby SPE Processor is held reset, and the Standby SPE's DRAM memory is refreshed (that is, all of Active SPE DRAM memory is shadowed to the Standby SPE memory). The refresh is necessary because while the Standby SPE is in Maintenance Mode, memory shadowing is disabled. When the Standby SPE is returned to Standby Mode, its memory must be brought up-to-date with Active SPE memory.

Because of its power to preempt Standby SPE maintenance activities, the refresh spe-standby command should be used judiciously. If the Standby SPE is in Maintenance Mode when the refresh spe-standby command is issued, the maintenance activity that is being conducted by the Standby SPE is immediately terminated with the following potential side-effects:

- Testing of the Standby SPE components that are the target of the maintenance activity may not have completed. Depending on the maintenance activity and the point at which it is terminated, tests that detect faults and/or lack of faults on those Standby SPE components may not have had the opportunity to run. Accordingly, alarms are not raised or retired on the components.

- If the maintenance activity is scheduled and if the refresh spe-standby command is issued before a scheduled translation save is performed, the translation save is not done and the translations data on the Active and Standby SPE mass storage devices do not reflect the changes made since the last translation save.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "refresh spe-standby," the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

If the refresh command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the refresh command is unsuccessful, the following message will be displayed on the SAT:

```
 Refresh not successful;
use 'display errors' to check for STBY-SPE errors
```

If the active SPE is held reset via the SPE select switches, then the following will be displayed:

```
 Could only hold Standby SPE reset because
Active SPE is locked via SPE select switches
```

If the standby is currently entering maintenance mode, then the following will be displayed:

```
 Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby is busy with another task, then the following will be displayed:

```
 Standby SPE not available; for information use "status
system"
```

If the standby is in the process of doing a software upgrade, then the following will be displayed:

```
 Standby SPE upgrade in progress, command denied
```

FEATURE INTERACTIONS

The refresh command is not allowed while the standby SPE is being brought out of standby mode into maintenance mode. Once fully in maintenance mode, however, the command can be executed.

release access-endpoint

This command will release a specified access endpoint.

SYNOPSIS

release access-endpoint extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

release access-endpoint 25012
release access-endpoint 77868

DESCRIPTION

The release access endpoint command will remove all ports associated with the specified access endpoint from a maintenance busy state. Periodic and scheduled tests will resume on the released ports. Maintenance will do background initialization testing on the released ports. For details of the test sequence, refer to [3].

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired access endpoint. The number of digits in an extension is determined by the dial-plan.

Help Messages

If the user presses HELP after entering "release access-endpoint," the following message is displayed:

```
Enter assigned extension
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the access endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not an access endpoint, the following message will be displayed:

```
Extension assigned to object other than access-endpoint
```

If the board that contains the access endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released. For wideband access endpoint the maintenance name for each port is "WAE-PORT." For single port access endpoint the maintenance name is "TIE-DS1."
Alt. Name	The alternate way of identifying the maintenance object. This field contains the extension number of the access endpoint.
Result	An indicator as to whether the object is successfully released. The possible values are: PASS, FAIL and ABORT.
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, the command "release access-endpoint 22502" was entered. Assume that the access endpoint ports for extension 22502 are in cabinet 1, carrier C, slot 11, circuit 1 to 6.

```
release access-endpoint 22502          page 1 of 1

                    COMMAND RESULTS

 Port  Maintenance Name Alt. Name  Result   Error Code
 01C1101  WAE-PORT    22502    PASS
 01C1102  WAE-PORT    22502    PASS
 01C1103  WAE-PORT    22502    PASS
 01C1104  WAE-PORT    22502    PASS
 01C1105  WAE-PORT    22502    PASS
 01C1106  WAE-PORT    22502    PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

release board

This command will release each maintenance object on the specified board.

SYNOPSIS

release board location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

release board 01c11
release board 02c15

DESCRIPTION

The release board command will put every administered maintenance object on the circuit pack at the specified location into operation. Some tests are done on the object to make sure that it can be used.

Defaults

No defaults.

Parameters

location	A "location" represents the physical position of the board to be busied out or released and is entered as "UUcSS" where "UU" represents the cabinet number (1-3), "c" represents the carrier, and "SS" represents the slot position.

Help Messages

If the system technician presses HELP after entering "release board," the following message will be displayed:

```
Enter 5 character board number
```

Error Messages

If the format of the board location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the board resides is not available, the following message will be displayed:

```
EPN is not available
```

If a board is not inserted in the specified location, the following message will be displayed:

```
Board not assigned
```

If the specified board does not have any maintenance objects associated with it, the following message will be displayed:

```
No MO in this board
```

If the specified board is a EI board and it is part of the active link, the following message will be displayed:

```
Illegal Command for active object; use 'set' to switch to
standby
```

If a reset is attempted on an invalid board in the service slot, the following message is displayed:

```
Board invalid
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the board in cabinet 1, carrier c, slot 7 is an analog board with three ports administered. The command that was entered is "release board 1c07."

```
release board 01C07

                    COMMAND RESULTS

Port   Maintenance Name  Alt. Name  Result  Error Code
01C07     ANL-BD                    PASS
01C0702   ANL-LINE                  PASS
01C0701   ANL-LINE        51001     PASS
01C0703   ANL-LINE                  PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release cdr-link

This command will release a maintenance object associated with the specified call detail recording (cdr)-link.

SYNOPSIS

release cdr-link link-id

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release cdr-link primary
release cdr-link secondary

DESCRIPTION

The release cdr-link command will remove the maintenance object associated with a specified call detail recording (cdr)-link from a maintenance busy state.

A link is made up of several components. It involves a far end data module, a simulated data channel on a PKTINT board, a manager that initiates and maintains the link, and a controller/protocol that services the link. A controller/protocol is usually a transient process that exists for as long as the link is up. A link is considered up if a physical connection is established. A link can be considered to be up while no useful work can be performed over it, in this case the link is insane and should be torn down. These links provide asynchronous data connections from the switch to peripherals.

For information on what a CDR link is and does, see the second paragraph in the "DESCRIPTION" section of the "status cdr-link" manual pages.

Defaults

No defaults.

Parameters

link-id The link identifier is either "primary" or "secondary."

Help Messages

If the system technician presses HELP after entering "release cdr-link," the following message will be displayed:

```
Enter 'primary' or 'secondary'
```

Error Messages

If the cdr-link is not administered, then the following message will be displayed:

```
Link not administered
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	Not applicable. Will always be blank.
Maintenance Name	The type of maintenance object that is being released. If releasing the primary cdr-link the maintenance object will be PRI-CDR, else if releasing the secondary cdr-link the maintenance object will be SEC-CDR.
Alt. Name	Not applicable. Will always be blank.
Result	The result of the release - "PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release cdr-link primary."

```
release cdr-link primary

                     COMMAND RESULTS

 Port  Maintenance Name  Alt. Name  Result   Error Code
          PRI-CDR                    PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release data-module

This command will release a system technician-specified data module or data channel.

SYNOPSIS

release data-module extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms.

EXAMPLES

release data-module 310

DESCRIPTION

The release data module command will put the specified data module (or data channel) into service. Some tests are executed on the hardware to verify that the equipment is functioning.

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired data module or data channel. The number of digits in an extension is determined by a dial-plan.

Help Messages

If the system technician presses HELP after entering "release data-module," the following message will be displayed:

```
Enter assigned extension
```

Error Messages

If the length or format of the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the specified extension is not administered, then the following message will be displayed:

```
Extension not assigned
```

If the specified extension is not a data module or a data channel, then the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the EPN that contains the data module port is not available, the following message will be displayed:

```
EPN is not available
```

If the board containing the data module port is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out or released, or the number of the data channel.
Maintenance Name	The type of maintenance object that is being busied out or released.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	An indicator as to whether the object was successfully busied out or released.
Error Code	A numerical description of why the command failed.

For the following output example, assume that the command that was entered is "release data-module 300."

```
release data-module 310

                         COMMAND RESULTS

Port   Maintenance Name  Alt. Name   Result   Error Code
01C1103    DIG-LINE                  PASS

Command successfully completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

release journal-printer

This command will release a maintenance object associated with the system technician specified pms-log or wakeup-log.

SYNOPSIS

release journal-printer [pms-log | wakeup-log]

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

release journal-printer pms-log
release journal-printer wakeup-log

DESCRIPTION

The release journal-printer command will put the maintenance object associated with a specified pms-log or wakeup-log link into service. Some tests are executed on the hardware to verify that the equipment is functioning.

For general information on journal printer links, see the second paragraph in the "DESCRIPTION" section of the "busyout pms-link" manual pages.

For information on what a journal printer is and does, see the second paragraph in the "DESCRIPTION" section of the "status journal-link" manual pages.

Defaults

None.

Parameters

wakeup-log	This will release the link to the wakeup logging facility. In the output the port name for this object is 0.
pms-log	This will release the link to the pms printer. In the output the port name for the pms link is 1.

Help Messages

If the system technician presses HELP after entering "release journal-printer," the following object command word choices will be displayed:

```
pms-log     wakeup-log
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out or released. In this case, the physical object port address will be a 0 for wakeup log and a 1 for the pms log.
Maintenance Name	The type of maintenance object that is being busied out or released.
Alt. Name	Not applicable.
Result	An indicator as to whether the object was successfully busied out or released.
Error Code	A numerical description of why the command failed.

For the following output example, assume that the command that was entered is "release journal-printer wakeup-log."

```
release journal-printer wakeup-log

                         COMMAND RESULTS

Port   Maintenance Name   Alt. Name   Result   Error Code
 0         JRNL-LINK                  PASS

Command successfully completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recover of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will not cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

release link

This command will release the system technician specified link.

SYNOPSIS

release link link-id

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release link 1
release link 8

DESCRIPTION

The release link command will put the maintenance objects associated with a specified link into service. Some tests are executed on the hardware to verify that the equipment is functioning.

Defaults

None.

Parameters

link-id	The link-id is a number associated with each link between 1-8. Link 1 through 4 reside on Processor Interface circuit pack "1a1" or "1b1" and 5 through 8 reside on Processor Interface circuit pack "1a2" or "1b2."

Help Messages

If the system technician presses HELP after entering "release link," the following message will be displayed:

```
Enter 1 character link number
```

Error Messages

If the link identifier is not valid, the following error message is displayed:

```
Link out of range, please press HELP
```

If the link is not administered, the following error message is displayed:

```
Link not administered or not enabled
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out or released. With this command the Port address represents the link-id.
Maintenance Name	The type of maintenance object that is being released.
Alt. Name	Not applicable.
Result	"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release link 1."

```
release link 1

                        COMMAND RESULTS

Port   Maintenance Name  Alt. Name  Result  Error Code
01C0301    PI-LINK                  PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release mis

This command will release a specified management information system.

SYNOPSIS

release mis

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, cust, rcust.

EXAMPLES

release mis

DESCRIPTION

The release mis command will put a management information system into service. Some tests are executed on the hardware to verify that the equipment is functioning.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "release mis" the following message will be displayed:

```
Entry is not required
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
 Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	Not applicable.
Maintenance Name	The type of maintenance object that is being released. MIS for this command.
Alt. Name	Not applicable.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A numerical description of why the command failed or was aborted. 1011 - already released

For the following output example, assume that the command that was entered is "release mis."

```
release mis

                       COMMAND RESULTS

Port   Maintenance Name   Alt. Name   Result   Error Code
               MIS                    PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

release modem-pool

This command will allow all members of a modem pool group to be released.

SYNOPSIS

release modem-pool group/*member*

PERMISSIONS

The following default logins may execute this command: init, inads, system technician.

EXAMPLES

release modem-pool 1
release modem-pool 4/3

DESCRIPTION

The release modem-pool command will remove the specified modem pool group or group member from the maintenance busy state. A single group member can be released by specifying the group number, a "/," and the member number. All members in a modem pool group can be released by specifying the modem pool group number only.

Defaults

None.

Parameters

group number	The group number is assigned from administration. The group number may be any administered group from 1-5.
member number	The member number is assigned from administration. A member is a pair of analog and digital line ports (or two pair for the Integrated modem-pool case). The member number may be any administered group member from 1-32.

Help Messages

If the system technician presses HELP after entering "release modem-pool" the following message will be displayed:

```
Enter assigned group number between 1-5
Or press CANCEL to cancel the command
```

Error Messages

If the "release modem-pool" command is entered from a login for which the command is not valid, then the following message will be displayed:

```
"release" is an invalid entry; please press HELP
```

If the group or member numbers entered are not in a valid format, the following message will be displayed:

```
Identifier invalid
```

If the group number entered is not within the range of groups or the member number is not within the member range, then the following message will be displayed:

```
Boards not assigned
```

If the specific group or member are not administered, then the following message will be displayed:

```
Group not assigned, or group assigned but with no member
```

If a software fault is encountered while the command is executing, the following message will be displayed:

```
Error encountered, can’t complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

When each modem pool member has been busied out, the following information will be displayed:

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object which is being busied out.
Maintenance Name	The type of maintenance object that is being busied out or released. This is always MODEM-PT.
Alt. Name	This field is not applicable to this command.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

In the following output example, the command "release modem-pool 1" was entered.

```
release modem-pool 1              SPE B

                        COMMAND RESULTS

Port      Maintenance Name   Alt. Name  Result   Error Code

01C0701      MODEM-PT                   PASS
01C0703      MODEM-PT                   PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release packet-control

This command will release the specified packet-control.

SYNOPSIS

release packet-control *location*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init

EXAMPLES

release packet-control 1A
release packet-control 1B

DESCRIPTION

The release packet-control command will put the packet-control circuit pack in-service, and reestablish each point-to-point signaling link that is terminated on this packet-control. This command is the complement to the busyout packet-control command which puts the packet-control in a out-of-service state and tears down all point-to-point signaling links terminated on this packet-control.

Defaults

For simplex systems, the location is optional and defaults to cabinet 1, carrier A. For duplex systems, the cabinet default is again cabinet 1, but there is no default for the carrier.

Parameters

location	The location only applies to duplicated configurations. If the configuration is a simplex, the location parameter is not used and thus is not valid. For duplicated configurations, a "location" represents the carrier that the packet-control resides on in the system. Valid locations are either 1A or 1B.

Help Messages

If the system technician presses HELP after entering "release packet-control," the following message is displayed:

```
Enter Packet Control location: [cabinet(1)];carrier(A-B)
```

Error Messages

If this command is entered for a packet-control that resides on the stand-by control complex of a High or Critical Reliability System, the following message is displayed:

```
Command only applies to the active Packet Control
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	This field represents the Cabinet-Carrier in which the Packet-Control resides.
Maintenance Name	The type of maintenance object that is being released which is always PKT-CTRL.
Alt. Name	This field is not used in this output display.
Result	An indicator as to whether the object was successfully released ("PASS," "FAIL," or "ABORT").
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, the command release packet-control 1A was entered.

```
release packet-control 1A

                      COMMAND RESULTS

Port  Maintenance Name   Alt. Name   Result   Error Code

 1A       PKT-CTRL                   PASS

Command successfully completed
```

FEATURE INTERACTIONS

In a High or Critical Reliability System, an attempt to release the packet-control that resides in the standby control complex will be disallowed.

When the packet-control in the active control complex is released from a previously busied-out state, all connectivity across the Packet Bus will be reestablished. Thus, all ISDN-BRI point-to-point signaling links that had been established via the packet-control prior to the execution of a busyout packet-control command will be reestablished by the release packet-control command.

release pms-link

This command will release a specified property management system link.

SYNOPSIS

release pms-link

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release pms-link

DESCRIPTION

The release pms-link command will remove all maintenance objects associated with a property management system link from the maintenance busy state.

A link is made up of several components. It involves a far end data module, a simulated data channel on a NETCON board, a manager that initiates and maintains the link, and a controller/protocol that services the link. A controller/protocol is usually a transient process that exists for as long as the link is up. A link is considered up if a physical connection is established. A link can be considered to be up while no useful work can be performed over it, in this case the link is insane and should be torn down. These links provide asynchronous data connections from the switch to peripherals.

For information on what a PMS is and does, see the second paragraph in the "DESCRIPTION" section of the "status pms-link" manual pages.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "release pms-link" the following message will be displayed:

```
Entry is not required
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	With this maintenance object the port field is left blank.
Maintenance Name	The type of maintenance object that is being released (always PMS-LINK).
Alt. Name	Not applicable.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release pms-link."

```
release pms-link

                       COMMAND RESULTS

Port   Maintenance Name    Alt. Name   Result    Error Code
          PMS-LINK                     PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recover of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will not cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

release port

This command will release a specified port on a circuit pack.

SYNOPSIS

release port location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release port 01c1101
release port 02c1501

DESCRIPTION

The release port command will remove the specified port on a circuit pack from a maintenance busy state.

Defaults

No defaults.

Parameters

location	A "location" represents the physical position of the port to be released and is entered as "UUcSSpp" where "UU" represents the cabinet number (1-3), "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit (port).

Help Messages

If the system technician presses HELP after entering "release port," the following message will be displayed:

```
Enter 7 character port number
```

Error Messages

If the format of the port location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the port resides is unavailable, the following message will be displayed:

```
EPN is not available
```

If the board on which the port resides is not administered, the following error message will be displayed:

```
Port not assigned
```

If the board on which the port resides is part of the SCI link, the following error message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the port is translated within a Wideband Access Endpoint, the following error message will be displayed:

```
 Port within wideband access endpt;
Use busyout access-endpoint <ext> instead
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	The result of the release -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the port in cabinet 1, carrier c, slot 7, circuit 1 is an analog port. The command that was entered is "release port 1c0701."

```
release port 01C0701

                          COMMAND RESULTS

   Port   Maintenance Name   Alt. Name   Result   Error Code
 01C0701     ANL-LINE                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release pri-endpoint

This command will release a specified PRI endpoint.

SYNOPSIS

release pri-endpoint extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

release pri-endpoint 25012
release pri-endpoint 77868

DESCRIPTION

The release PRI endpoint command will remove all PRI endpoint ports (B-channels) associated with the specified PRI endpoint from a maintenance busy state. Periodic and scheduled tests will resume on the released ports. The switch will attempt to negotiate with the far-end PRI terminal adapter to put each PRI endpoint port (B-channel) into in-service state. Maintenance will do background initialization testing on the released ports. For details of the test sequence, refer to [3].

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired PRI endpoint. The number of digits in an extension is determined by the dial-plan.

Help Messages

If the user presses HELP after entering "release pri-endpoint," the following message is displayed:

```
Enter assigned extension
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the PRI endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a PRI endpoint, the following message will be displayed:

```
Extension assigned to object other than pri-endpoint
```

If the board that contains the PRI endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released. The name for PRI endpoint port is "PE-BCHL."
Alt. Name	The alternate way of identifying the maintenance object. This field contains the extension number of the PRI endpoint.
Result	An indicator as to whether the object is successfully released. The possible values are: PASS, FAIL and ABORT.
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, the command "release pri-endpoint 22501" was entered. Assume that the PRI endpoint ports for extension 22501 are in cabinet 1, carrier B, slot 20, circuit 1 to 6.

```
release pri-endpoint 22501            page 1 of 1

                          COMMAND RESULTS

 Port      Maintenance Name Alt. Name  Result   Error Code
 01B2001        PE-BCHL       22501     PASS
 01B2002        PE-BCHL       22501     PASS
 01B2003        PE-BCHL       22501     PASS
 01B2004        PE-BCHL       22501     PASS
 01B2005        PE-BCHL       22501     PASS
 01B2006        PE-BCHL       22501     PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

release sp-link

This command will release the system printer link.

SYNOPSIS

release sp-link

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release sp-link

DESCRIPTION

The release sp-link command will return the busied out system printer link to operation and resolve all active alarms for the system printer link.

The system printer link is a link from the switch to an external printer over which jobs can be printed. This link is created by administering the system printer extension and setting up a call to the system printer.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "release sp-link," the following is displayed:

```
Entry is not required
```

Error Messages

If the system printer link is not administered, the following message is displayed:

```
Link not administered or not enabled
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being busied out. For this maintenance object, blanks are displayed.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	An indicator as to whether the object was successfully busied out.
Error Code	A numerical description of why the command failed.

For the following output example the command entered was "release sp-link."

```
release sp-link               SPE A

                      COMMAND RESULTS

Port   Maintenance Name   Alt. Name   Result   Error Code
            SYS-PRNT                   PASS

Command Successfully Completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

release spe-standby

This command allows the technician to release the standby Switch Processing Element (SPE).

SYNOPSIS

release spe-standby

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release spe-standby

DESCRIPTION

The release spe-standby command removes the busyout status of the standby SPE. Memory shadowing will be restored, a memory refresh of the standby SPE will occur and 1 minute later the equivalent of scheduled standby SPE maintenance will be performed which will return the standby SPE's Fault Severity Level to the appropriate value.

Release of the standby SPE will be allowed if communication to the standby is down.

Defaults

No defaults.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "release spe-standby" the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

Port	The port address will display the cabinet and carrier location of the standby SPE. The standby SPE port address will always be 01A or 01B.
Maintenance Name	"STBY-SPE" for the standby SPE maintenance object.
Alt. Name	Always blank for this command.
Result	The result of the release -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the standby SPE is located in carrier "B." The command that was entered is "release spe-standby."

```
release spe-standby              SPE A

                         COMMAND RESULTS

Port  Maintenance Name    Alt. Name    Result    Error Code
01B       STBY-SPE                     PASS

Command successfully completed
```

FEATURE INTERACTIONS

When the standby SPE is released a memory refresh is performed which may take several minutes to complete. The standby Fault Severity Level will be lowered to its appropriate level when a release is requested. One minute later, the equivalent of scheduled standby SPE maintenance will be performed, after which a spontaneous SPE interchange could occur, depending of the Fault Severity Level of the two SPE's.

If the standby SPE is in poor health, memory shadowing can not be enabled or communication to the standby is impossible, a release of the standby SPE will still be successful.

release station

This command will release a specified station.

SYNOPSIS

release station extension

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init.

EXAMPLES

release station 10020
release station 32770

DESCRIPTION

The release station command will remove the specified administered voice terminal extension (station) from a maintenance busy state.

Defaults

No defaults.

Parameters

extension	An extension number associated with the desired voice terminal. The number of digits in an extension is determined by a dial-plan.

Help Messages

If the system technician presses HELP after entering "release station," the following message will be displayed:

```
Enter extension for an assigned station
```

Error Messages

If the format of the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the specified extension is not administered, then the following message will be displayed:

```
Extension not assigned
```

If the specified extension does not belong to a station or attendant console, the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the station port resides on an EPN that is unavailable, the following message will be displayed:

```
EPN is not available
```

If the station port resides on a board that is not inserted in the system, the following message will be displayed:

```
Board not assigned
```

If the station port resides on a board that is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release station 1002."

```
release station 1002

                         COMMAND RESULTS

 Port      Maintenance Name   Alt. Name   Result   Error Code
 01C1102       DIG-LINE                   PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release tdm

This command will release a TDM bus on the PPN or any EPN.

SYNOPSIS

release tdm port-network pn number bus bus

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release tdm port-network 1 bus a
release tdm port-network 1 bus b

DESCRIPTION

The release tdm command will remove the specified tdm bus from a maintenance busy state.

Defaults

No defaults.

pn number	The PN number specifies the Port Network number of the TDM bus to be released.
bus	The TDM bus ("a" or "b") specifies which half of the TDM bus is desired. Each 512 time slot TDM bus is configured as two duplicate 256 time slot buses. This division allows for duplication of control channels and dedicated tone time slots. The default control bus (carrying the control channel) is the "a" bus, while the default tone bus (carrying dedicated tones) is the "b" bus. A port network number (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "release tdm," the following message will be displayed:

```
Enter ’port-network’, port network number (1-3),
 ’bus’, bus (’a’ or ’b’)
```

Error Messages

If the technician enters "bus" before "port-network," the following message will be displayed:

```
'bus' is an invalid identifier; please press HELP
```

If the technician does not enter all digits for the port-network number, the following message will be displayed:

```
Entry must be all digits
```

If the technician enters a bus other than A or B, the following message will be displayed:

```
Identifier invalid
```

If the technician enters a TDM bus identifier with a Port Network number that is not administered, the following message will be displayed:

```
Port Network number not assigned
```

If the port network on which the desired TDM bus resides is unavailable, the following message will be displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port network number (preceded by "PN") and the bus ("A" or "B") associated with the TDM bus.
Maintenance Name	TDM-BUS is the maintenance object being released.
Alt. Name	Not applicable.
Result	The result of the release -"PASS," "ABORT," "FAIL,"
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release tdm port-network 1 bus a."

```
release tdm port-network 1 bus a

                        COMMAND RESULTS

Port     Maintenance Name   Alt. Name   Result    Error Code
PN 01A       TDM-BUS                    PASS

Command successfully completed
```

FEATURE INTERACTIONS

If a bus is busied out, no calls will be torn down. However, no new calls will be set up on the busied out bus.

Dedicated tone time slots must be moved to another bus (the other half of the duplicated bus) before a busyout of a particular bus will be allowed.

release tone-clock

This command will release a tone/clock circuit pack.

SYNOPSIS

release tone-clock location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release tone-clock c

DESCRIPTION

The release tone-clock command will remove the specified tone/clock from a maintenance busy state.

Defaults

The cabinet number will default to 1 (one).

Parameters

location	A "location" represents the physical position of the tone/clock to be released and is entered as "UUc" where "UU" represents the cabinet number, and "c" represents the carrier. A single digit cabinet number (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "release tone-clock," the following message will be displayed:

```
Enter tone/clock location:
[cabinet(1-3)];(carrier(A-E))
```

Error Messages

If an identifier greater than 3 (three) characters is entered, or the cabinet entered is not a digit (number), the following message will be displayed:

```
Identifier invalid
```

If the carrier entered is invalid, the following message will be displayed:

```
Invalid carrier specified
```

If the cabinet entered is not within the valid range of cabinets or the cabinet is not administered, the following message will be displayed:

```
Cabinet number not assigned
```

If there is no tone/clock board at the specified location, one of the following messages will be displayed:

```
Board not inserted
Board not assigned
```

If the specified cabinet carrier location is that of a switch node, the following message will be displayed:

```
Switch Node carrier specified;
invalid command for SN carrier
```

If the cabinet carrier location entered is that of an EPN that is not available, the following message will be displayed:

```
EPN is not available
```

If the tone/clock is not busied out and the specified action is release, the following message will be displayed:

```
Object is not busied out; can't release
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The tone clock circuit pack maintenance object will only display the cabinet and carrier of the desired tone/clock board.
Maintenance Name	The type of maintenance object that is being released is TONE-PT, TDM-CLK and TONE-BD.
Alt. Name	Not applicable.
Result	The result of the release -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release tone-clock 1a."

```
release tone-clock 1a

                          COMMAND RESULTS

Port   Maintenance Name   Alt. Name   Result   Error Code
01A         TONE-PT                    PASS
01A         TDM-CLK                    PASS
01A         TONE-BD                    PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

release trunk

This command will release a specified trunk group or trunk group member.

SYNOPSIS

release trunk group/*member*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

release trunk 78
release trunk 78/1

DESCRIPTION

The release trunk command will remove the specified trunk group or trunk group member from a maintenance busy state. A single group member can be released by specifying the group number, a "/," and the member number. All members in a trunk group can be released by specifying the trunk group number only.

Defaults

No defaults.

Parameters

group	The group number is an administered number associated with each trunk group. The valid range is 1 - 99.
member	The member number is an administered number identifying a particular trunk within a trunk group. The valid range is 1 - 99.

Help Messages

If the system technician presses HELP after entering "release trunk," the following message will be displayed:

```
Enter assigned trunk group number [or group/member]
```

Error Messages

If the format of the identifier is invalid, the following message will be displayed:

```
Format invalid
```

If the range of the trunk group is incorrect, the following error message will be displayed:

```
Trunk or trunk group invalid
```

If the specified trunk group is not administered or has no members, the following message will be displayed:

```
Group not assigned,
or group assigned but with no member
```

If the specified member is not administered, the following message will be displayed:

```
Group member not assigned
```

If the specified trunk group is part of the SCI link, the following message will be displayed:

```
Cannot busyout/release part of SCI link
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being released.
Maintenance Name	The type of maintenance object that is being released.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	The result of the release - "PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes can be found in the "Busyout/Release Commands" section of this chapter.

For the following output example, assume that the command that was entered is "release trunk 78/1."

```
release trunk 78/1

                           COMMAND RESULTS

 Port     Maintenance Name    Alt. Name   Result    Error Code
 01C1505        CO_TRK           78/01     PASS

Command successfully completed
```

FEATURE INTERACTIONS

None.

reset board

This command will reset the specified board.

SYNOPSIS

reset board location *repeat number*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

reset board 01c11
reset board c08
reset board 03d12 r 3

DESCRIPTION

The reset board command will perform a soft (i.e. software) reset of every administered port on the port circuit pack at the specified location. All ports must be busied out before the port circuit pack is reset. The most efficient way of doing this is to perform a busyout of the board before resetting it.

WARNING:
This command is service disrupting and may cause extraneous alarms.

Defaults

The carrier and repeat number default to 1.

Parameters

location	A "location" represents the physical position of the port board to be reset and is entered as "UUcSS" where "UU" represents the cabinet number (1 - 3), "c" represents the carrier, and "SS" represents the slot position.
number	The "number" specifies how many times each board reset is to be repeated. "Number" may be any integer between 1 and 100.

Help Messages

If the system technician presses HELP after entering "reset board," the following message will be displayed:

```
Enter board location, [’repeat’ (1-100)]
```

Error Messages

If the format of the board location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the specified board is not available, the following message will be displayed:

```
EPN is not available
```

If a board is not inserted in the specified location, then the following message will be displayed:

```
Board not assigned
```

If the specified board is active, the following message will be displayed:

```
Illegal command for active object;
use ’set’ to switch to standby
```

If a reset is attempted on an invalid board in the service slot, the following message is displayed:

```
Board invalid
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	The port address (cabinet-carrier-slot) of the maintenance object that is being reset.
Maintenance Name	The type of maintenance object being reset.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Result	The result of the reset -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the reset failed or aborted. A detailed list of the codes can be in the "Reset Commands" section of this chapter.

For the following output example, assume that the board in port network 1, carrier c, slot 7 is an analog board with three ports administered. The command that was entered is "reset board 1c07."

```
reset board 1C07

                              TEST RESULTS

 Port    Maintenance Name    Alt. Name Test No. Result    Error Code
 01C07        ANL-BD                      53     PASS

Command Successfully Completed
```

FEATURE INTERACTIONS

None.

reset interface

This command will reset the processor interface board (PI).

SYNOPSIS

reset interface location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

reset interface 01a1
reset interface a2
reset interface 01b1
reset interface 01b2

DESCRIPTION

This command resets the Processor Interface circuit pack, causes its associated software to be read from tape, applications processes to be restarted, permanent switched calls to be re-established, and each enabled link to be setup. If the interface cannot be established, a Major alarm i s raised on the interface and all enabled links are taken out-of-service. When the Message Server Adjunct (MSA), Distributed Communications System (DCS), Audio Information Exchange (AUDIX), or Call Management System (CMS) is first administered and the form submitted, the link for these applications and the submittal of the form restart the interface. Before the Processor Interface circuit pack is replaced, the switch must be powered down and then restarted (unless the system is equipped with High or Critical Reliability).

When resolving troubles, also see the **status interface, status link,** and **status processor-channel** commands to determine where the trouble is located before performing a **reset interfaces** because link traffic is interrupted.

WARNING:
The interface command interrupts operation of the AP, DCS, AUDIX, CMS or ISDN-PRI.

Defaults

No defaults.

Parameters

location	The location (cabinet-carrier-position) of the processor interface (PI board). The position determines which processor interface circuit pack will be cleared. A position of 1 is the first processor interface in the carrier, while a position of 2 is the second processor interface in the carrier.

Help Messages

If the system technician presses HELP after entering "reset interface," the following message will be displayed:

```
Enter identifier: [cabinet(1)];carrier(A-B);position(1-2)
```

Error Messages

If the specified carrier is not the active PE, the following message will be displayed:

```
Command must be executed from active SPE
```

If the technician-entered cabinet and carrier is invalid for a PPN, the following message will be displayed:

```
Invalid port-network specified
```

If the technician-entered carrier is not a valid carrier, the following message will be displayed:

```
Invalid carrier specified
```

If the technician-entered carrier is not active, the following error message will be entered:

```
Board invalid
```

If the specified carrier/position processor interface circuit pack is not inserted, but the specified carrier is active, the following error message will be displayed:

```
Processor Interface (TN765)
not started or is being started
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed; use the
"refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the reset interface command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the reset interface command is unsuccessful, the following message will be displayed:

```
Error encountered, can’t complete request
```

FEATURE INTERACTIONS

None.

reset maintenance

This command will reset the EPN maintenance circuit pack in any Expansion Port Network cabinet.

SYNOPSIS

reset maintenance location

PERMISSIONS

The following logins may execute this command: system technician, inads, init.

EXAMPLES

reset maintenance 02
reset maintenance 2
reset maintenance 3a

DESCRIPTION

The reset maintenance command performs a reset on a technician specified EPN maintenance circuit pack. Specifying cabinets 2 or 3 resets the EPN maintenance circuit pack in the 'a' carrier of the specified cabinet.

This command is destructive and will drop a SAT terminal session on the EPN maintenance circuit pack being reset. If this command is run from a EPN maintenance SAT terminal, the results of the reset will not be displayed.

Defaults

None.

Parameters

location	The location designates the physical position of the desired EPN maintenance circuit pack. The location consists of a cabinet number and carrier letter. The cabinet number is one digit, 2 through 3 with a leading zero allowed. The carrier is always "a" if entered.

Help Messages

If the system technician presses HELP after entering "reset maintenance" the following message will be displayed:

```
Enter cabinet([0]2-[0]3);[carrier(A)]
```

Error Messages

On any system, if the cabinet entered is non numeric or not within a valid range, the following message will be displayed:

```
Cabinet number out of range; Enter 2 - 3
```

For any system, if the length of the user entered parameter exceeds three (3), or is in any other way invalid, the following message will be displayed:

```
Entry invalid
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

Port	The port address (cabinet-carrier-slot) of the maintenance object that is being reset.
Maintenance Name	"MAINT" for the EPN maintenance circuit pack.
Alt. Name	Always blank for this command.
Result	The result of the reset -"PASS," "ABORT," "FAIL."
Test No.	The test number for this command will always be 306.
Error Code	A system-generated number that tells why the reset failed or aborted. A detailed list of the codes can be in the "Reset Commands" section of this chapter.

For the following output example, assume that the command that was entered is "reset maintenance 02a."

```
reset maintenance 02A

                              TEST RESULTS

Port   Maintenance Name  Alt. Name  Test No.  Result  Error Code
02A           MAINT                    306      PASS

Command successfully completed
```

FEATURE INTERACTIONS

Running the command from the EPNSAT, will cause the SAT to be dropped before the reset results can be displayed. In this case, the user should examine the error and alarm logs for "MAINT" entries to determine if the reset failed.

reset spe-standby

This command will reset the standby Switch Processing Element (SPE) to a defined level.

SYNOPSIS

reset spe-standby level

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

reset spe-standby 1
reset spe-standby 2
reset spe-standby 3
reset spe-standby 4
reset spe-standby 5

DESCRIPTION

The reset spe-standby command will reset the standby Switch Processing Element (SPE) to a system technician defined level. Resetting the standby SPE means bringing that SPE out of standby mode into maintenance mode with the defined restart level. This command is only for a High or Critical Reliability System.

Defaults

None.

Parameters

level — The reset levels are entered numerically with a range of 1 - 5, the levels are as follows:

Level	Recovery
1	Warm Restart
2	Cold-2
3	Cold-1
4	Reboot
5	Extended Reboot

Help Messages

If the system technician presses HELP after entering "reset spe-standby" on a duplex SPE system, the following message will be displayed:

```
Enter standby SPE recovery level ’1’(WARM), ’2’(COLDII),
’3’(COLDI), ’4’(REBOOT) or ’5’(EXT REBOOT)
```

Error Messages

If the specified level is invalid (not 1-5), the following message will be displayed:

```
System reset level invalid
```

If the standby SPE is not refreshed and the SPE Select switches are selecting the active SPE, the following message will be displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is not refreshed; the following message will be displayed:

```
Standby SPE memory not refreshed; use the
"refresh spe-standby" command
```

OUTPUT

If the reset command is successful, the following message will be displayed:

```
Command successfully completed
```

If the reset command is unsuccessful, the following error message will be displayed:

```
Standby SPE failed to reset with requested level;
check for STBY-SPE errors
```

If the standby is in the process of doing a software upgrade, then the following will be displayed:

```
Standby SPE upgrade in progress, command denied
```

FEATURE INTERACTIONS

The reset spe-standby command will invoke standby SPE initialization as if low level maintenance had done it. This means that the reset level requested will never be escalated by software. The reset level requested by the technician will always be the level that is performed.

If the standby SPE contains a software memory card (386 systems) or a tape (286 systems) and the requested restart level is 4 or 5, then the standby SPE will reload system software before rebooting.

reset system

This command will reset the Switch Processing Element (SPE) to a defined level, or switch control to the standby SPE.

SYNOPSIS

reset system [level **|** interchange]*health-override*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

reset system 1
reset system 2
reset system 3
reset system 4
reset system 5
reset system interchange
reset system interchange health-override

DESCRIPTION

The reset system command will reset a Switch Processing Element (SPE) to a system technician defined level. This command is increasingly destructive as the reset level increases.

The command can also be used to switch control from the currently active SPE to the standby SPE in a High or Critical Reliability System through a HOT (planned) restart interchange. **Once a planned interchange has been started it cannot be aborted by pressing the CANCEL key.** If a "reset system interchange" command is rejected because the Fault Severity Level of the standby SPE is higher than that of the active SPE, the "health-override" option can be specified to try to force a HOT interchange.

The reset system interchange command does not disrupt in-progress calls. However, it drops links to local and remote administration terminals and also drops and re-establishes connections on the Network Control Circuit Pack data channels. This includes CDR and PMS links. No new calls can be made during the interchange, but stable calls are not affected.

When a system restart occurs with the corresponding vector bit set, a core dump is written to tape (286 systems) or memory card (386 systems, only if the memory card is the special core dump card), the vector is cleared, and the requested restart is performed.

All successful reset system commands will log the user off.

Defaults

None.

Parameters

llevel — The reset levels are entered numerically with a range of 1 - 5, the levels are as follows, and the approximate times are listed for each appropriate level and system configuration:

Level	Recovery	SMALL 386 Flash	MEDIUM 386 Flash	286 Intel
1	Warm Restart			1:00
2	Cold-2			4:00
3	Cold-1			8:00
4	Reboot			13:00
5	Extended Reboot			14:00

interchange — Control of the system passes to the standby SPE as the active SPE becomes the standby SPE and the standby SPE becomes the active SPE. The optional "health-override" qualifier can be entered to force an interchange even if the Fault Severity Level of the standby SPE would normally cause the maintenance software to abort the interchange. The Fault Severity Level of an SPE is determined by the alarmed components in that SPE. Each component is given a severity level, and the single worst alarm (severity) for a SPE defines Fault Severity Level for the SPE. The table below lists the maintenance objects, their alarms, severities and the restart level of the interchange that affect a SPE's Fault Severity Level.

Maintenance Object	Alarm Level	On/Off Board	Fault Severity Level	Restart Level
STBY-SPE	WARNING	OFF	120	None
MEM-BD	MAJOR or MINOR	ON	110	Hot or Warm
MEMORY	MAJOR or MINOR	ON	110	Hot or Warm
STBY-SPE	MAJOR	ON	100	None
PROCR	MAJOR	ON	70	Hot or Warm
SW-CTL	MAJOR	ON	65	Cold 2
TAPE	MAJOR	OFF	65	Cold 1
MEM-CARD	MAJOR	OFF	65	Cold 1
12V-PWR	MIN	ON	65	Hot
DUPINT	MAJOR	ON	61	Hot
CARR-POW	MAJOR	ON	61	Cold 2
SHDW-CIR	MAJOR	ON or OFF	60	Warm
SHDW-LINK	MAJOR	ON	60	Warm
SW-CTL	MINOR	ON	40	Hot
PR-MAINT	MINOR	ON	30	Hot
PI-BD	MAJOR or MINOR	ON	20	Hot
PKT-CTRL	MAJOR	ON or OFF	20	Hot
PKT-CTRL	MINOR	ON or OFF	15	Hot
PI-PT	MAJOR	ON	15	Hot
DATA-CHL	MINOR	ON	15	Hot
DATA-CON	MINOR	ON	15	Hot
DATA-BD	MINOR	ON	15	Hot
TAPE	MINOR	ON or OFF	10	Hot
MEM-CARD	MINOR	ON or OFF	10	Hot
PR-MAINT	MINOR	OFF	8	Hot

A "reset system interchange" command will abort for the following reasons:

- If the standby SPE is down
- If the active SPE is locked active
- If communication to the standby SPE is not possible
- If memory shadowing to the standby SPE is not functioning
- If the standby SPE is not fully refreshed
- If the standby SPE is busied out

health-override — If a HOT restart interchange fails because the Fault Severity Level of the standby SPE is higher than that of the active SPE, the "health-override" option can be specified to try to force a switch to occur. If the switch occurs, this option causes the new active SPE Fault Severity Level to be raised as much as possible in hopes that a software initiated HOT SPE interchange switch back to the original active SPE will not occur. This artificial raising of the active Fault Severity Level will last for one hour at which time the Fault Severity Level of both SPEs will return to their normal values based on the alarms listed in the table above.

Help Messages

If the system technician presses HELP after entering "reset system" on a simplex SPE system, the following message will be displayed:

```
Enter system recovery level ’1’(WARM), ’2’(COLDII),
’3’(COLDI), ’4’(REBOOT), or ’5’(EXT REBOOT)
```

If the system technician presses HELP after entering "reset system" on a duplex

SPE system, the following message will be displayed:

```
Enter system recovery level ’1’(WARM), ’2’(COLDII),
’3’(COLDI), ’4’(REBOOT),  or ’5’(EXT REBOOT)
 or ’interchange [’health-override’]’
```

Error Messages

If the CANCEL key is pressed after the command has been started, the following message is displayed:

```
This command may not be canceled
```

If the system reset level is not numeric or "interchange," the following message will be displayed:

```
System reset level invalid
```

If the "health-override" option is specified with any level of 1 - 5, the following message will be displayed:

```
The 'health-override' option is only used
with the 'interchange' level
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If this command is issued while an **upgrade software** command is active the following message will be displayed:

```
Standby SPE upgrade in progress, command denied
```

OUTPUT

If the reset command, including the "reset system interchange," is successful the user will be logged off.

If the "reset system interchange" command is not successful one of the following are displayed:

If the "interchange" option is specified and the active SPE is locked active, the following message will be displayed:

```
Unable to interchange because the
active SPE is locked active
```

If the "interchange" option is specified and only the Fault Severity Level of the standby SPE is preventing the interchange, the following message will be displayed:

```
Unable to interchange due to alarms on the standby SPE;
Use 'health-override' option
```

If the "interchange" option is specified and the standby SPE is busied out, the following message will be displayed:

```
Unable to interchange; standby SPE is busied out
```

If the reset interchange command cannot be performed for any other reason, the following message will be displayed on the SAT:

```
Cannot perform SPE interchange;
for information use 'status system'
```

FEATURE INTERACTIONS

The reset command will invoke system initialization as if low level maintenance had done it. This means that the reset level requested will never be escalated by software. The reset level requested by the technician will always be the level that is performed.

It should be noted that there are two hardware switches associated with the active and standby SPEs. These hardware switches override any demand maintenance activities that the system technician requests. If the active SPE is locked active with these hardware switches, an interchange will not take place until the active is unlocked using the same hardware switches.

A successful SPE interchange will always logoff the PPNSAT terminal.

Any level of restart will null out the effect of the health-override option.

restore announcements

This command copies announcement data from the specified MSS device (tape or Card-Mem) to the announcement board.

SYNOPSIS

restore announcements *[print | schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, cust, rcust, inads, init.

EXAMPLES

restore announcements

DESCRIPTION

The restore announcements command copies announcement data from the active MSS device to the announcement board.

Defaults

In a tape based system, the announcement data is copied from the active processor's tape to the announcement board. In a Card-Mem based system, the announcement data is copied from the active processor's Card-Mem to the announcement board.

Parameters

print	In addition to displaying the output of the restore announcement command on the Manager I terminal, print the result of the restore announcement command on the printer.
scheduled	Schedule the execution of the restore announcement command at a specific time.

Help Messages

If the system technician presses HELP after entering "restore announcements," the following message is displayed:

```
Enter ['print' or 'schedule']
```

Error Messages

If the announcement data module cannot be accessed (upload/download port is active), the following message is displayed:

```
Announcement data module not available
```

If the announcement data module has been taken out of service, the following message is displayed:

```
Announcement data module out of service
```

If one or more of the announcement ports are in use, the following message is displayed:

```
Announcement port in use; please try later
```

If the announcement data module is not administered, the following message is displayed:

```
Required announcement data module not administered
```

If the announcement data module is not administered or is currently in use, the following message is displayed:

```
Required data module not administered or unavailable
```

If there is no announcement board in the system, the following message is displayed:

```
Integrated announcement board not present
```

If the NETCON data module is not administered or out of service the following message is displayed:

```
Required NETCON data module not
administered or out-of-service
```

If the NETCON data module is busy the following message is displayed:

```
Required NETCON data module unavailable
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

Processor	This field displays the processor on which the MSS device resides that was used to copy announcement data.
Command Completion Status	This field specifies whether the command completed successfully. Valid values are:
Error Code	This is a numerical description of whether the announcement file is successfully restored to the announcement board. A value of "0" means that the restore was successful. A value of "1" denotes that the restore failed.

For the following output example, the command entered is "restore announcements" on a simplex SPE system.

```
restore announcements         Page  1 of  1  SPE A

                 RESTORE ANNOUNCEMENTS

Processor  Command Completion Status         Error Code
SPE-A      Success                                0
```

FEATURE INTERACTIONS

WARNING:
Use of the manager I is blocked for other activities until the command completes, which can take up to 45 minutes

The command is denied if no announcement data module and no NETCON data module has been administered.

The command is denied if the announcement data module port is out of service or active (e.g. performing an announcement playback).

The command is denied if a user is in an integrated announcements session.

The command is denied if the board is currently being uploaded or downloaded. A user cannot save or restore announcement after the restore announcements command has started.

The command aborts if copying from tape and no tape is in the tape drive.

The restore announcements command will not be allowed if the MSS is in use. The MSS may be in use by either another user or by maintenance.

In case of a failure, it is the user's responsibility to make sure the announcement file is completely copied to the announcement board. If an error is the result of a hardware or firmware failure, the MSS software will log a hardware error with maintenance.

The restore announcements command will not be allowed if no announcement file has been saved on the MSS or a corrupted announcement file is on the MSS.

In case of a failure, it is the user's responsibility to make sure the announcement file is completely copied to the announcement board, although the system will continually attempt to download the board in 10 minute intervals until a download is successful, announcements are recorded, or a download is initiated from the SAT. The user should take appropriate action based on the error message returned. If the error is the result of a hardware or firmware failure, the MSS software will log a hardware error with maintenance. Maintenance software will invoke tests to diagnose and attempt to correct the problem. If maintenance software fails to correct the problem, an alarm is raised and the system technician should take appropriate action.

In the case where the system crashes and/or there is a spontaneous processor interchange, the restore operation will fail. In this case, there will not be a valid announcement file on the announcement board. The command should be restarted on the newly active processor to copy the announcements from the active processor's MSS device to the announcement board. Until the announcements are successfully and completely copied to the announcement board, calls will not be connected to any announcements on the ANN board.

When the announcement board is plugged in or reset, maintenance will perform a series of tests, including a DRAM Checksum test. The test will fail due to the power loss to the board, resulting in automatic downloading of the announcement file.

resume hardware-group

A "test hardware-group" command which had been canceled can be resumed by the user with this command. The reactivated hardware-group command will start testing where it previously left off.

SYNOPSIS

resume hardware-group

PERMISSIONS

The following logins may execute this command: inads, init.

EXAMPLES

resume hardware-group

DESCRIPTION

A system technician, in the course of the execution of a "test hardware-group" command, may find the need to halt the testing, either temporarily or permanently. A "test hardware-group" command executing in the background can be canceled with the "cancel hardware-group" command. A "test hardware-group" command executing in the foreground can be canceled by pressing the 'cancel' key on the SAT or by entering the "cancel hardware-group" command from another SAT. The "resume hardware-group" command provides the technician the ability to resume the previous "test hardware-group" command from where it was canceled. This ability to resume a canceled "test hardware-group" command is lost if another "test hardware-group" command is entered.

The state of a canceled "test hardware-group" command will appear on the "status hardware-group" screen as 'canceled'. The state of a resumed "test hardware-group" command will appear on the "status hardware-group" screen as 'active'.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "resume hardware-group," the following message will be displayed:

```
Entry is not required
```

Error Messages

If there is no "test hardware-group" command to be resumed, i.e, no "test hardware-group" command was previously canceled, or some system recovery had occurred and no "test hardware-group" command had since been entered and subsequently canceled, then the following message will be displayed:

```
Command aborted - no hardware-group
test available to resume
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the previously entered hardware-group command used the "all-ports" option the following message will be displayed:

```
Resume disallowed with 'all-ports'
option in original command
```

If the previously entered hardware-group command used the "SPE-interchange" option the following message will be displayed:

```
Resume disallowed with 'SPE-interchange'
option in original command
```

OUTPUT

If a "test hardware-group" command is successfully resumed as a consequence of the "resume hardware-group" command and the previous "test hardware-group" was executing in the background, then the following response will be displayed:

```
Hardware-group command successfully
resumed in background
```

If a "test hardware-group" command is successfully resumed as a consequence of the "resume hardware-group" command and the previous "test hardware-group" was executing in the foreground, then the test results will start being displayed on the SAT.

FEATURE INTERACTIONS

Cancel hardware-group

When a "test hardware-group" command is canceled, the test command is put in an inactive state. This state can be displayed using the "status hardware-group" screen and will show up as 'canceled'.

When the "resume hardware-group" command is entered to resume a previously canceled "test hardware-group" command, the state of the test command will be changed to 'active' on the "status hardware-group" screen.

save announcements

This command copies announcement data from the announcement board to the MSS. (tape or Card-Mem)

SYNOPSIS

save announcements *[spe-active | spe-standby]*

PERMISSIONS

The following default logins may execute this command: system technician, cust, rcust, inads, init.

EXAMPLES

save announcements
save announcements spe-active
save announcements spe-standby

DESCRIPTION

The save announcements command copies announcement data from the announcement board to the MSS. In a 286 based system, the tape is the storage device for the system. In a 386 based system, the Card-Mem is the storage device for the system. By default, announcement data is written to the MSS device in a simplex processor (SPE) system, or to both MSS devices in a High or Critical Reliability System. Also, the save announcements command can be directed to write to the MSS device on either of the processors, in a High or Critical Reliability System.

This command is only allowed if there is an integrated announcement board in the system. The save announcement command is denied if no announcement data module has been administered and no NETCON data module has been administered.

Simplex

There are no options for the save announcement in a simplex system. The save announcement command will save the announcement file to the MSS device.

Duplex

If no options are specified, the system saves the announcement to both processors' MSS devices.

Parameters

spe-active	This option forces the system to write the announcement data to the specified device in the currently active processor.
spe-standby	This forces the system to write the announcement data to the specified device in the standby processor.

Help Messages

If the system technician presses HELP after entering "save announcements" on a simplex SPE system the following message is displayed:

```
Entry is not required
```

If the system technician presses HELP after entering "save announcements" on a duplex SPE system the following message is displayed:

```
Enter ['spe-active' or 'spe-standby']
```

Error Messages

If the announcement data module cannot be accessed (upload/download port is active), the following message is displayed:

```
Announcement data module not available
```

If the announcement data module is out of service, the following message is displayed:

```
Announcement data module out of service
```

If one or more of the announcement ports are in use, the following message is displayed:

```
Announcement port in use; please try later
```

If there are no announcements on the announcement board, the following message is displayed:

```
No announcements on board
```

If the announcement data module is not administered, the following message is displayed:

```
Required announcement data module not administered
```

If the announcement data module is not administered or is currently in use, the following message is displayed:

```
Required data module not administered or unavailable
```

If there is no announcement board in the system, the following message is displayed:

```
Integrated announcement board not present
```

If the standby processor times out, the following message is displayed:

```
Command timed out on standby processor
```

If an inconsistency between the NETCON data module and the announcement data module exists (e.g. both data modules using the same COR) the following message is displayed:

```
System error, please try later
```

If the NETCON data module is not administered or out of service the following message is displayed:

```
Required NETCON data module not
administered or out-of-service
```

If the NETCON data module is busy the following message is displayed:

```
Required NETCON data module unavailable
```

If the time of day is not set, the following message is displayed:

```
Please set the time of day before proceeding
```

If the standby SPE is inaccessible, the following message is displayed:

```
Cannot access the standby SPE at this time
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

OUTPUT

Processor	This field displays the processor(s) that had the announcement data written to its/their device(s). Valid values are "SPE-A" and "SPE-B."
Command Completion Status	This field specifies whether the command completed successfully. Valid values are:
Error Code	A value of "0" specifies that the save was successful. A value of "2" specifies that the save failed.

For the following output example, the command entered is "save announcements" on a simplex SPE system.

```
save announcements           Page  1 of  1  SPE A

                      SAVE ANNOUNCEMENTS

Processor  Command Completion Status         Error Code
SPE-A      Success                                0
```

FEATURE INTERACTIONS

WARNING:
Use of the manager I is blocked for other activities until the command completes, which can take up to 45 minutes.

The command is denied if no announcement data module and no NETCON data module has been administered.

The command is denied if the announcement data module port is out of service or active (e.g. performing an announcement playback).

The command is denied if no announcements are on the board or a user is in an integrated announcements session.

The command is denied if the board is currently being uploaded or downloaded. A user cannot record an integrated announcement after the save announcements command has started although 15 channels are still available for announcement playback (one is reserved for uploading and downloading).

The command aborts if saving to the tape and no tape is in the tape drive or the tape is write-protected. The command also abort if no NETCON data module is available.

The save announcements command will not be allowed if the MSS is in use. The MSS may be in use by either another user or by maintenance.

If the user requests that announcements be saved to the standby processor, the standby processor must be in service and shadowing must be enabled.

When MSS devices on both processors in a High or Critical Reliability System are specified, the save announcements operation will save announcement data from the announcement board to the active MSS device, then to the standby MSS device. The status of each save operation is reported to the user separately. If one of the save operations fail, the save operation to the other device continues. The goal is to save the new announcement data on some MSS device so that it is not lost totally; this will cause the announcement data to be inconsistent between these MSS devices.

In case of a failure, it is the user's responsibility to make the announcement files on the two MSS devices consistent. The files may become inconsistent due to hardware failures or spontaneous processor interchanges. If announcement files are inconsistent due to failure on the hardware used during the save announcements command, the user should take appropriate action based on the error message returned. Maintenance software monitoring this hardware will log a hardware error with maintenance. Maintenance software will invoke tests to diagnose and attempt to correct the problem. If maintenance software fails to correct the problem, an alarm is raised and the system technician should take appropriate action.

The save announcements command writes two time-stamped identical copies of announcement data to the selected device(s). The time stamp for both copies will be the same, i.e. the time of writing to the first copy. Each copy contains a timestamp and the state of the copy (i.e., "good" or "bad").

If a good copy of the announcement file is not available, then the restore announcements operation can not be executed until the save announcements command is successfully completed. The announcements on the board are still accessible and usable.

save translation

This command allows the user to save the in-memory translation data to the tape (286 processor) or memory card (386 processor) device.

SYNOPSIS

save translation *[spe-active | spe-standby]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, cust.

EXAMPLES

save translation
save translation spe-active
save translation spe-standby

DESCRIPTION

All translation data is dept in memory during system operation. This means that all data would be lost if the switch went down. The save translation operation will allow the user to save to tape or memory card the in-memory translation data. This operation may be done as part of scheduled maintenance and/or on demand by the customer/system technician.

Simplex

The default is to save translation to the tape/memory-card on SPE_A.

Duplex

The default is to save translation to the tape/memory-card on both SPE-A and SPE-B.

Parameters

spe-active	This identifies that the save translation should be done on the active processor's MSS device.
spe-standby	This identifies that the save translation should be done on the standby processor's MSS device.

Help Messages

If the system technician presses HELP after entering "save translation" the following message will be displayed:

```
Enter ['spe-active' or 'spe-standby']
```

Error Messages

If there is another tape activity currently running on the system, then the following message will be displayed:

```
A tape command is active;
this command is not allowed at this time
```

If the user chooses that save be done on the standby processor, and the standby processor is inaccessible, then the following message will be displayed:

```
Cannot access the standby SPE at this time
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

The responses will be displayed on an SPE basis with one line of data displayed for each SPE.

Processor	This identifies the processor carrier that was translation data was saved to. (i.e. SPE-A, or SPE-B).
Command Completion Status	This may display a variety of messages, to identify the success or failure of the command on the given processor:

For the following output example, assume that the command, save translation is done on a duplex system.

```
save translation

                         SAVE TRANSLATION

Processor   Command Completion Status         Error Code
SPE-A       Success                                0
SPE-B       Success                                0

Command Successfully Completed
```

FEATURE INTERACTIONS

The save translation cannot be performed if translation data is being changed by an administration command.

set expansion-link

This command sets the Expansion-Interface Link between the PPN and an EPN or between two EPNs to a specific Interface Link circuit pack between PPN and EPN.

SYNOPSIS

set expansion-link link-identifier

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

set expansion-link 02a01
set expansion-link 3a02

DESCRIPTION

This command sets the Expansion-Interface Link between the PPN and an EPN or between two EPNs to a specific Interface Link circuit pack between PPN and EPN.

Note: This command can corrupt any active data links between the PPN and an EPN or between two EPNs.

Defaults

No defaults.

Parameters

link-identifier	The circuit pack address of the designated Standby Expansion Interface circuit pack (identified as 1A01, 1A02, 1B01, 1B02, 2A01, 2A02, 2B03, 3A01, 3A02, 3AB02 or 3B03).

Help Messages

If the system technician presses HELP after entering "set expansion-interface," the following message will be displayed:

```
Enter board location:
```

```
[cabinet(1-3)];carrier(A-E);slot(0-20)
```

Error Messages

If the format of the specified expansion interface circuit pack is invalid, the following message will be displayed:

```
Port/Board invalid
```

If the link associated with the entered EI location is already active, the following message will be displayed:

```
EXP-INTF is already on active link
```

If the specified expansion interface is not configured in the system, the following message will be displayed:

```
Board not assigned
```

If the specified expansion interface is already the active link, the following message will be displayed:

```
EXP-INTF is already on active link
```

If the specified expansion interface is unable to become active, the following message will be displayed:

```
Standby EXP-INTF Link is unable to take over
```

If there are no maintenance objects for the specified board, the following message will be displayed:

```
No MO in this board
```

If the specified board is not an expansion interface board, the following message will be displayed:

```
Address is not a valid Expansion Interface Board
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following message indicates that the command completed successfully:

```
Command successfully completed
```

The following message indicates that the command was aborted:

```
Command aborted; please try later
```

The following message indicates that the command failed:

```
Error encountered, can’t complete request
Command failed
```

FEATURE INTERACTIONS

None.

set options

This command allows the user to administer whether certain alarms are reported to INADS or whether they are downgraded to a minor alarm, warning alarm, or no alarm.

SYNOPSIS

set options

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

set options

DESCRIPTION

This special command enables the technician (that is, remote user with INADS permission) to select which types of maintenance categories report alarms automatically and which types require the customer to call in. Judicious use of this command can reduce the number of ineffective alarms to the TSC. For the **set options** command to be effective, the default settings specified in this section should always be used. These settings are not intended to be changed on a per-system basis. Special circumstances (for example, special studies) may require temporary changes under the guidance of Tiers 3 and 4.

NOTE: Alarms can't be upgraded.

Defaults

Initially, the alarm reporting options for On-board Trunk Alarms (Alarm Group 1), both Major and Minor, and Minor, and the Memory Card Capacity Alarm are set to "yes" (y); all others are set to "warning" (w). All trunk groups are associated with alarm severity group 1 by default.

Parameters

None.

Help Messages

If the user presses HELP after entering "set options," the following message is displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message is displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

FORM INPUT

After entering the command "set options," the user is presented with the following form.

```
set options                                          Page 1 of  8

                      ALARM REPORTING OPTIONS

                                            Major  Minor
                   On-board Station Alarms:  w     w
                  Off-board Station Alarms:  w     w
     On-board Trunk Alarms (Alarm Group 1):  y     y
    Off-board Trunk Alarms (Alarm Group 1):  w     w
     On-board Trunk Alarms (Alarm Group 2):  w     w
    Off-board Trunk Alarms (Alarm Group 2):  w     w
     On-board Trunk Alarms (Alarm Group 3):  w     w
    Off-board Trunk Alarms (Alarm Group 3):  w     w
     On-board Trunk Alarms (Alarm Group 4):  w     w
    Off-board Trunk Alarms (Alarm Group 4):  w     w
                    On-boar Adjunct Alarms:  w     w
                          Off-board Alarms:  w     w
                      Off-board DS1 Alarms:  w     w
                  Off-board PI-LINK Alarms:  w     w
                  Off-board Alarms (Other):  w     w
               Memory Card Capacity Alarms:        y
```

```
set options                                            Page  2 of  8

                          TRUNK GROUP ALARM OPTIONS
                               (Alarm Group)

01: 1  11: 1  21: 1  31: 1  41: 1  51: 1  61: 1  71: 1  81: 1  91: 1
02: 1  12: 1  22: 1  32: 1  42: 1  52: 1  62: 1  72: 1  82: 1  92: 1
03: 1  13: 1  23: 1  33: 1  43: 1  53: 1  63: 1  73: 1  83: 1  93: 1
04: 1  14: 1  24: 1  34: 1  44: 1  54: 1  64: 1  74: 1  84: 1  94: 1
05: 1  15: 1  25: 1  35: 1  45: 1  55: 1  65: 1  75: 1  85: 1  95: 1
06: 1  16: 1  26: 1  36: 1  46: 1  56: 1  66: 1  76: 1  86: 1  96: 1
07: 1  17: 1  27: 1  37: 1  47: 1  57: 1  67: 1  77: 1  87: 1  97: 1
08: 1  18: 1  28: 1  38: 1  48: 1  58: 1  68: 1  78: 1  88: 1  98: 1
09: 1  19: 1  29: 1  39: 1  49: 1  59: 1  69: 1  79: 1  89: 1  99: 1
10: 1  20: 1  30: 1  40: 1  50: 1  60: 1  70: 1  80: 1  90: 1
```

NOTE:
The remaining Trunk Group information is shown on the next 6 pages and is not documented in this Manual.

On the first page of the Alarm Reporting Options Form, the user selects the alarm severity options for station alarms, the four trunk alarm severity groups, the adjunct alarms, off-board DS1 alarms, and PI-LINK alarms, memory card translation capacity alarms, and other off-board alarms. On the second page, known as the Alarm Reporting Options Form, the user assigns an alarm severity group to each trunk group. This feature enables the technician to reduce the level of alarms reported for on-board or off-board trouble conditions.

The following alarm options are available:

- Minor

  Alarms are raised as maintenance testing discovers them but the severity of the alarm is downgraded to a minor. Alarmed resources that would have normally been taken out of service are still taken out of service. LEDs on the port board and maintenance board follow the normal Minor alarm LED strategy and there is a call to the receiving OSS.

- Warning

  Alarms are raised as maintenance testing discovers them, but the severity of the alarm is downgraded to a warning. The advantage to the technician here is that the Alarm Log can still be used to pinpoint trunk or station problems reported by the customer. Alarmed resources that would normally have been taken out-of-service are still taken out-of-service. Alarm LEDs light on the port circuit pack and Maintenance circuit pack as before, but no attendant LEDs or stations reporting alarms are affected. There is no call to INADS.

- Report

  This option treats the alarms in the same way as the warning category with one exception: alarms are reported to INADS using a special WARNING category. When an alarm of this type is received, INADS logs the occurrence and either creates a trouble ticket or closes it immediately. The retry strategy for a call of this type is similar to normal Major or Minor alarm reports. However, the acknowledgment LED on the attendant console or alarm reporting station does not reflect the status of the call.

- Yes

  Alarms are raised in the normal manner. There is no filtering of alarm data.

- No

  Alarms raised on a trunk, station, or adjunct in this category are dropped. Error information is provided as before, but there is no trace of an alarm. There is no LED activity and no call to INADS. Because resources are taken out-of-service without any record, this option is recommended only when other options do not provide the desired result.

The alarm options can be administered only on a system-wide basis for the following alarm categories:

- Major on-board station alarms
- Minor on-board station alarms
- Major off-board station alarms
- Minor off-board station alarms

Four alarm severity groups are provided for trunk alarms. You can administer the alarm options for the categories listed below in each alarm severity group. However, in G1, the alarm options can be administered only on a system-wide basis for the following categories:

- Major on-board trunk alarms
- Minor on-board trunk alarms
- Major off-board trunk alarms
- Minor off-board trunk alarms

For Adjuncts, an alarm severity option is assigned to each of the following categories:

- Major on-board adjunct alarms
- Major off-board adjunct alarms
- Minor on-board adjunct alarms
- Minor of-board adjunct alarms

You can also administer the options on a system-wide basis for Minor off-board DS1 Interface circuit pack alarms and for the Minor off-board Memory Card Capacity Alarm.

Alarm reporting options information in the Alarm Reporting Options Form is considered translation data and, thus, is preserved through all levels of restart.

This feature affects the alarming of the MOs listed below. Neither the trunk nor the station category applies to alarms raised on the common portion of the circuit pack.

In all cases, if the option associated with the alarm type is set to "n," the alarm report is dropped. All error information about the alarm is intact, but there is no record of an alarm and no LEDs light on the port circuit pack, the Maintenance circuit pack, the attendant console, or alarm reporting station to indicate a problem.

If the option is set to "warning" or "report," port circuit pack LEDs and LEDs on the Maintenance circuit pack are affected the same as normal warning alarms.

The default parameters are as follows:

- Downgrade all station, trunk (except on-board trunk alarms), and Minor DS1-BD alarms to warning alarms.
- On-board Major and Minor trunk alarms, and the Memory Card Capacity alarm should continue to raise alarms and report to INADS.

Station MOs Affected By This Command

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-reported problems.

- Analog Lines (ANL-LINE, ANL-NE-L, ANL-16-L)
- Digital Lines (DIG-LINE)
- Hybrid Lines (HYB-LINE)
- MET Lines (MET-LINE)
- ISDN-BRI Lines (BRI-PORT, BRI-SET)

Trunk maintenance is characterized by an escalation of a Minor alarm to a Major alarm if more than 75 percent of the members of the trunk group are alarmed. If the option for the trunk category is set to "warning," "minor," "report," or "no," this no longer happens. Maintenance removes an individual trunk member out-of-service according to the normal criteria used for Major and Minor alarms.

Trunk MOs Affected By This Command:

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-reported problems.

- Auxiliary Trunks (AUX-TRK)
- Central Office Trunks (CO-TRK)
- Direct Inward Dialing Trunks (DID-TRK)
- Direct Inward and Outward Dial Trunks (DIOD-TRK)[G1.2SE only]
- DS1 Central Office Trunks (CO-DS1)
- DS1 Direct Inward Dialing Trunks (DID-DS1)
- DS1 Tie Trunks (TIE-DS1)
- ISDN Trunks (ISDN-TRK)
- Tie Trunks (TIE-TRK)

Circuit Pack MOs Affected By This Command

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-reported problems.

NOTE:
Trunks that are not members of Trunk Groups, (e.g. PCOLs) are downgraded according to the alarm severity of group one.

- DS1 Interface Circuit Pack (DS1-BD)

Adjunct-Related MOs Affected By This Command

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-reported problems.

- ASAI Adjunct (ASAI-ADJ)
- AT&T Adjunct Port (ATT-PORT)
- Ethernet ASAI Port (LGATE-PT)
- Ethernet ASAI Adjunct (LGATE-AJ)
- Ethernet AT&T Port (ATTE-PT)
- Ethernet AT&T Adjunct (ATTE_AJ)
- ISDN-BRI Ports connected to Adjuncts (ABRI-PORT)

Although adjuncts are administered as stations, the administration of alarm severity for the station alarm group does not affect the alarm severity levels of the adjuncts. Similarly, the administration of alarm severity for the adjunct alarm group does not affect the alarm severity levels for other types of stations.

PI-Link and associated Link MOs affected by this Command:

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-related problems.

- See Processor Interface Link ["PI-LINK (Processor Interface Link)"] for other associated Link Maintenance Objects.

Memory Card MOs Affected by This Command

NOTE:
While this option does not downgrade the CAP-MEM alarm by default, changes to this options may result in alarms being downgraded to warning. This alarm is raised when the memory card translation capacity is over 98% full and is intended to alert Services to inform the customer of a possible need to upgrade to a larger flash card.

- Memory Card Capacity (CAP-MEM)

Other MOs Affected by This Command

NOTE:
Although alarms on these MOs may appear as warnings, the alarms should be investigated with user-related problems.

- EPN Maintenance Circuit Pack (MAINT)
- Expansion Interface (EXP-INTF)
- ISDN-PRI Signaling Group (ISN-SGR)
- Journal Printer (JNL-PRNT)
- PMS Link (PMS-LINK)
- PMS log printer (PMS-LOG)
- Primary CDR Link (PRI-CDR)
- Secondary CDR Link (SEC-CDR)
- SPE Select Switches (SPE-SELEC)
- Synchronization (SYNC)
- System Communication Interface (PI-SCI)
- System Printer (SYS-PRNT)

- TDM Clock (TDM-CLK)
- Tone Generator Circuit Pack (TONE-BD)

Field Help

Since all fields on the first page may have the same values, then pressing HELP in any field on the first page presents the following field help message:

```
m(inor) n(o) r(eport) w(arning) y(es)
```

The following is a description of the values:

m(inor)	Downgrade the major alarm to a minor alarm and report the alarm to INADS.
n(o)	Do not log the alarm or report it to INADS.
r(eport)	Downgrade the alarm to a warning and report the warning to INADS.
w(arning)	Downgrade the alarm to a warning, log it but do not report the alarm to INADS.
y(es)	Log and report the alarm to INADS.

All fields on page 2 may have the same values. Pressing HELP in any field on page 2 gives the following field help message:

```
Enter alarm group number: 1 to 4
```

The alarm group number is a way of distinguishing four different groups of alarms. These alarm groups allow the user to specify that alarms in different groups are handled differently from those in other groups.

Field Error Messages

All of the fields on the first page allow the same values. Only one error message is printed for all first page fields. If the value is not one of the listed characters (m,n,r,w,or y) then the following message is displayed:

```
"X" is an invalid entry; please press HELP key
```

All of the fields on page 2 allow the same values. If the value in one of these fields is not numeric, the following message is displayed:

```
Entry must be all digits
```

All of the fields on pages page 2 allow the same values. If the value in one of these fields is a digit other than 1, 2, 3, or 4, the following message is displayed:

```
Entry out of range
```

OUTPUT

After the user has entered in the changes to the options and pressed SUBMIT, the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

set signaling-group

This command sets the secondary D-channel within the specified group to be the primary D-channel.

SYNOPSIS

set signaling-group group identifier

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

set signaling-group 1
set signaling-group 2

DESCRIPTION

The set signaling-group command sets the secondary D-channel in the specified signaling group to be the primary D-channel. The primary D-channel then becomes the secondary D-channel.

A signaling group is a collection of B-channels signaled for by a designated single D-channel or set of D-channels over an ISDN-PRI.

Defaults

None.

Parameters

group identifier	The signaling group identifier is an administered number associated with each signaling group.

Help Messages

If the system technician presses HELP after entering "set signaling-group," the following is displayed:

```
Enter group identifier
```

Error Messages

If the specified group identifier is non numeric or out of range, the following message is displayed:

```
Signaling group invalid
```

If the specified group identifier is not administered, the following message is displayed:

```
No signaling group assigned
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the set signaling-group command is successful, the following message will be displayed on the SAT:

```
Command successfully completed
```

If the set signaling-group command is unsuccessful, the following message will be displayed:

```
Error encountered, can’t complete request
```

FEATURE INTERACTIONS

None.

set synchronization

This command will set the DS1 trunk or tone/clock circuit pack that is to supply an on-line reference for synchronization.

SYNOPSIS

set synchronization location

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

set synchronization 01c08
set synchronization 02a01
set synchronization 01a
set synchronization 02c

DESCRIPTION

The set synchronization command will set the DS1 trunk or active tone/clock circuit pack that will supply a reference for synchronization. The set command will work only after synchronization has been disabled via the "disable synchronization" command. Any administered DS1 trunk or active tone/clock may be entered with the set command. The DS1 or tone/clock will remain as the synchronization reference until the set command is run with another board or until the "enable synchronization" command is run.

After the "enable synchronization" command is run, an administered primary or secondary synchronization source will be used as the synchronization reference. If no primary or secondary source is administered, then synchronization will use an active tone/clock board as the synchronization reference after synchronization has been enabled.

The synchronization subsystem provides error free digital communication between the switch and other PBXs, COs, or customer premise equipment. The subsystem is made up of system components involved in synchronization: TDM bus clock, DS1 trunk board, maintenance and administration software resident in the SPE.

Defaults

No defaults.

Parameters

location	A "location" represents the physical position of the board (DS1 trunk or active tone/clock) that will supply a reference for synchronization. The location of a DS1 trunk is entered as "UUcSS" where "UU" represents the cabinet number, "c" represents the carrier, and "SS" represents the slot position. The location of a tone/clock is entered as "UUc" where "UU represents the cabinet number, and "c" represents the carrier. The location of a tone/clock may also be entered as "UUcSS" where "UU represents the cabinet number, "c" represents the carrier, and "SS" represents the slot position. A cabinet number (1 - 3) may be entered with or without a leading zero (0).

Help Messages

If the system technician presses HELP after entering "set synchronization," the following message will be displayed:

```
Enter DS1 board location or Tone-Clock location:
[(cabinet (1-3)]; carrier (A-E))
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

Can not set synchronization to standby tone clock circuit pack.

```
Cannot set synchronization to standby tone/clock board.
```

OUTPUT

The following message indicates that the command completed successfully:

```
Command successfully completed
```

The following message indicates that the command was unsuccessful, due to synchronization not being disabled:

```
Must disable synchronization-switch first
```

The following message indicates that the command was unsuccessful, due to the board not being inserted:

```
Board not inserted
```

The following message indicates that the command was unsuccessful, due to an invalid board being specified (not a DS1 trunk or tone/clock):

```
Port/Board invalid
```

The following message indicates that the command was unsuccessful, due to reasons other than the ones listed above:

```
Error encountered, can’t complete request
```

FEATURE INTERACTIONS

None.

set tdm

This command will set which TDM bus has the control channel and dedicated tones on it.

SYNOPSIS

set tdm port-network pn number bus bus *override*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

set tdm port-network 2 bus a
set tdm port-network 2 bus b override

DESCRIPTION

The set tdm command will set which TDM bus on a port network has the control channel and dedicated tones on it.

Defaults

No defaults.

Parameters

pn number	The PN number specifies the Port Network number of the TDM bus to be set.
bus	The TDM bus ("a" or "b") specifies which half of the TDM bus is desired. Each 512 time slot TDM bus is configured as two duplicate 256 time slot buses. This division allows for duplication of control channels and dedicated tone time slots. The default control bus (carrying the control channel) is the "a" bus, while the default tone bus (carrying dedicated tones) is the "b" bus. A port network number (1 - 3) may be entered with or without a leading zero (0).
override	This qualifier is optional, it will force the setting of a bus which is out of service or a bus whose dedicated tone time slots are in use.

Help Messages

If the system technician presses HELP after entering "set tdm," the following message will be displayed:

```
Enter ’port-network’, port network number (1-3),
’bus’, bus (’a’ or ’b’); [’override’]
```

Error Messages

If the technician enters "bus" before "port-network," the following message will be displayed:

```
’bus’ is an invalid identifier; please press HELP
```

If the technician does not enter all digits for the port-network number, the following message will be displayed:

```
Entry must be all digits
```

If the technician enters a bus other than A or B, the following message will be displayed:

```
Identifier invalid
```

If the technician enters a Port Network number that is not administered, the following message will be displayed:

```
Port Network number not assigned
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following message indicates that the command completed successfully:

```
Command successfully completed
```

The following message indicates that the command was unsuccessful, due to the tdm bus being busied out:

```
Must release tdm bus first
```

The following message indicates that the command was unsuccessful, due to the health of the tdm bus:

```
Tdm bus is out-of-service; use ’override’
option to force ’set’ command
```

The following message indicates that the command was unsuccessful, due to the dedicated tone time slots being used:

```
Dedicated tone time slots in use; use ’override’
option to force ’set’ command
```

The following message indicates that the command was unsuccessful, due to a tone/clock (TN768) board not being available:

```
Cannot set tdm bus or tone/clock boards;
need a TN768 board
```

The following message indicates that the command was unsuccessful, due to the expansion port network (EPN) not being available:

```
EPN is not available
```

The following message indicates that the command was unsuccessful, due to the link to the expansion port network (EPN) not being available:

```
EXP-INTF not available; please try later
```

FEATURE INTERACTIONS

In the rare event that all time slots on a particular bus are being used, and the dedicated tone time slots are on the other half of the bus, the time slots reserved for tones on the bus that has no other time slots available will be used for new calls. If the technician then performs a "set" command to the bus that has calls up on the dedicated tone time slots, these calls will be dropped.

set time

This command will allow the system technician to set the time of day clock on the switch.

SYNOPSIS

set time

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

set time

DESCRIPTION

The set time command will present the system technician with a form that contains the current time of day on the switch. The system technician may then edit and submit the form in order to change the time of day. The set time command allows the system technician to change the day of the week, the day of the month, the month, year, hour, and minute. The second field will be reset to zero (0) whenever the time on the clock is altered, but cannot be modified by the technician. The day of the week will be entered as a text string and will be translated to an integer for internal storage.

If no change is made to any field when the command is entered, there will be no update of the clock when the form is submitted. If the command is entered and the form is unchanged, the time will not be reset to the time displayed on the screen, but will remain the same as the current system clock time.

Defaults

If the system clock has never been set, a default time is used.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "set time," the following message will be displayed:

```
Entry is not required
```

Error Messages

If the system encounters an error in getting the current time of day, then the following message will be displayed:

```
Error encountered, cannot complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

FORM INPUT

After entering the command "set time," the system technician will be presented with the following form. The current time, or default time will be placed in the fields.

Day of the Week:	The day of the week that will be used by the time of day clock on the switch. Valid entries are Monday through Sunday. The timer will maintain the value of the day of the week, incrementing it every twenty-four (24) hours, and resetting it at the seventh day.
Day of the Month:	The day of the month that will be used by the system time of day clock. 1-31 are valid entries. A check for leap year is also made, February can have 29 days in 1984, but only 28 in the year 1990.
Month:	The month that will be used by the system time of day clock. Any of the twelve months are valid entries.

Year:	The year that will be used by the time of day clock on the switch. 1970-2999 are valid entries for the year field. The year must be saved as translation data and passed to the kernel whenever kernel memory is corrupted (system reboot or cold I restart) or the data is changed.
Hour:	The hour that will be used by the system for the time of day clock. 0-23 are valid hours that can be entered into this field.
Minute:	The minute that will be used by the time of day clock on the system. 0-59 are valid entries for the minute field.
Second:	The second that will be used by the time of day clock on the system. This field is restricted, and can't be set to a specific value by the technician. This field is set to zero when the time of day clock is set.

```
set time                                            Page 1 of 1

                          DATE AND TIME

  DATE
    Day of the Week: _________  Month: _________
   Day of the Month: __          Year: ____

  TIME
          Hour: __     Second:
        Minute: __
```

Field Help

Following are the help messages that the system technician will see upon tabbing to the specified field and pressing the HELP key.

Day of the Week:	A list of the days of the week will be presented on the bottom line. The help is longer than 80 characters, consequently, the "(MORE)" message will appear. In order to get the continuation of the list, the system technician needs to type another help key. The list of key words is: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.
Day of the Month:	"Enter current day 1-31."
Month:	A list of the months of the year will be presented on the bottom line. The help is longer than 80 characters, consequently, the "(MORE)" message will appear. In order to get the continuation of the list, the system technician needs to select the HELP key. The list of key words is: January, February, March, April, May, June, July, August, September, October, November, December.
Year:	"Enter current year"
Hour:	"Enter number between 0-23"
Minute:	"Enter number between 0-59"
Second:	This field is restricted and consequently the system technician cannot tab to or change this value.

Field Error Messages

Following are the error messages that will be displayed on the bottom of the screen. The messages are displayed when the system technician tabs out of a field and the validation routines are executed.

Day of the Week:	""xxxxxx" is an invalid entry; please press HELP"
Day of the Month:	"Day invalid"
Month:	""xxxx" is an invalid entry; please press HELP"
Year:	"Year invalid"
Hour:	"Hour invalid"
Minute:	"Minute invalid"

OUTPUT

After the system technician has entered in the corrections to the time and pressed the submit key (ENTER), then the following message appears at the bottom of the screen:

```
Command successfully completed
```

FEATURE INTERACTIONS

The date and time are generally available to all software via a system primitive.

set tone-clock

This command will set which tone/clock is active in a port network.

SYNOPSIS

set tone-clock location *override*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

set tone-clock 01b
set tone-clock 1b
set tone-clock 01b override
set tone-clock a

DESCRIPTION

The set tone-clock command will set which tone/clock is active in a port network. This command is only for cases where the tone/clock circuit pack is duplicated in a port network.

The default active tone clock in each port network should be set back to active after any use of the "set tone-clock" command. The tone-clock duplication strategy assumes that the active is always in use if it is healthy. If it is not in use, a single failure can result in unnecessary service outage. Schedule maintenance tone-clock switch option does not set the tone-clock back to the default active if it wasn't active at the beginning of the test.

Defaults

The cabinet number defaults to one (1) if it is not specified.

Parameters

location	A "location" represents the physical position of the tone/clock to be tested and is entered as "UUc" where "UU" represents the cabinet number (1-3), and "c" represents the carrier. The "b" carriers only contain tone-clock circuit packs when the system is equipped with High or Critical Reliability.
override	This qualifier is optional. If used, it will force the set command into effect regardless of the health of the tone/clock circuit pack.

Help Messages

If the system technician presses HELP after entering "set tone-clock," the following message will be displayed:

```
Enter tone/clock location:
[cabinet(1-3)];(carrier(A-E)) ['override']
```

Error Messages

If an identifier greater than 3 (three) characters is entered, or the cabinet entered is not a digit (number), the following message will be displayed:

```
Identifier invalid
```

If the carrier entered is invalid, the following message will be displayed:

```
Invalid carrier specified
```

If the cabinet entered is not within the valid range of cabinets or the cabinet is not administered, the following message will be displayed:

```
Cabinet number not assigned
```

If there is no tone/clock board at the specified location, one of the following messages will be displayed:

```
Board not inserted
Board not assigned
```

If the specified cabinet carrier location is that of a switch node, the following message will be displayed:

```
Switch Node carrier specified;
invalid command for SN carrier
```

If the cabinet carrier location entered is that of an EPN that is not available, the following message will be displayed:

```
EPN is not available
```

If the board is not a TN768 tone/clock board, the following error message will be displayed:

```
Cannot set tdm bus or tone/clock boards;
need a TN768 board
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following message indicates that the command completed successfully:

```
Command successfully completed
```

If the tone/clock selected is out of service, the following message will be displayed:

```
Tone/clock board is out-of-service;
use 'override' option to force 'set' command
```

The following message indicates that the command was unsuccessful, due to the tone/clock being busied out:

```
Must release tone/clock board first
```

The following message indicates that the command was unsuccessful, due to the epn in which the tone/clock resides not being available:

```
EPN is not available
```

The following message indicates that the command was unsuccessful, due to the link to the EPN in which the tone/clock resides:

```
EXP-INTF not available; please try later
```

The following message indicate that the command was unsuccessful, due to the standby system clock:

```
Unable to activate the standby
```

```
System Clocks; please try later
```

The following message indicates that the command was unsuccessful, due to the standby system tones:

```
Unable to activate the standby
System Tones; please try later
```

FEATURE INTERACTIONS

None.

set vector

This command will set the conditions that cause a core dump of memory to tape or a core dump memory card.

SYNOPSIS

set vector condition *[spe-standby | spe-active | spe-maint]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

SIMPLEX SYSTEM EXAMPLES:
set vector f
set vector 9
DUPLEX SYSTEM EXAMPLES:
set vector f spe-standby
set vector f spe-active
set vector f spe-maint
set vector 9

DESCRIPTION

The set vector command specifies what level of restart must occur before a core dump occurs. The memory copy (core dump) is placed on the primary Mass Storage System (a tape in a tape system and a core dump memory card in a memory card system) device so that it may be examined at a later date. The set vector command allows the technician to tailor what level of restarts will cause memory to be copied to the primary Mass Storage System device.

NOTE:
An extended reboot will never be requested by software.

To force a core dump to occur immediately by user demand in a simplex or duplex system, the appropriate bit should be set using this command, then a "reset system" should be done at a level that will force a core dump corresponding to the set vector bit.

When a system restart occurs in a simplex Switch Processing Element (SPE) system with the corresponding vector bit set, the core dump is written to secondary storage (the primary MSS device). Once the core dump is written, the vector is cleared and the restart is performed. **This command is always service disruptive in a simplex system.**

When a system restart occurs on the active SPE in a High or Critical Reliability System with the corresponding vector bit set, and the "spe-active" option was selected when the vector bit was set, the active SPE will perform a core dump. **Service will be disrupted while the active SPE is performing the requested core dump.**

When a system restart occurs on the active SPE in a High or Critical Reliability System with the corresponding vector bit set, and the "spe-standby" option was selected when the vector bit was set, the standby SPE will perform a core dump after the standby SPE has refreshed its memory.

When a system restart occurs on the active SPE in a High or Critical Reliability System with the corresponding vector bit set, and the "spe-maint" option was selected when the vector bit was set, the standby SPE will perform a core dump without refreshing its memory first.

In all cases after a core dump has been performed, the vector will be cleared.

Defaults

In a High or Critical Reliability System, the default option is "spe-standby."

Parameters

condition	The condition(s) which cause(s) a core dump represented by a hexadecimal value. The hexadecimal value represents the bit map of the four reset conditions which cause the dump. These conditions from least to most significant bit are: WARM start, COLDII restart, COLDI restart, and REBOOT. To set more than one condition, the logical OR of the bits needed is used to determine the hexadecimal character. Setting a vector to a condition of 0 actually clears the vector, and the vector is not considered set.

Vector-Condition Mapping

value	WARM	COLDII	COLDI	REBOOT
0	n	n	n	n
1	y	n	n	n
2	n	y	n	n
3	y	y	n	n
4	n	n	y	n
5	y	n	y	n
6	n	y	y	n
7	y	y	y	n
8	n	n	n	y
9	y	n	n	y
a	n	y	n	y
b	y	y	n	y
c	n	n	y	y
d	y	n	y	y
e	n	y	y	y
f	y	y	y	y

spe-standby — This option is only specified for a High or Critical Reliability System and is the default option. It specifies that if a restart occurs on the active SPE and the corresponding vector bit is set, a core dump will be taken on the standby SPE after the standby SPE has performed a refresh of memory.

spe-active — This option is only specified for a High or Critical Reliability System. It specifies that if a restart occurs on the active SPE and the corresponding vector bit is set, a core dump will be taken on the active SPE. This option is the default in simplex SPE systems (no options are specified in a simplex SPE system, but spe-active is always assumed). **This option is service disrupting.**

spe-maint	This option is only specified for a High or Critical Reliability System. It specifies that if a restart occurs on the active SPE and the corresponding vector bit is set, a core dump will be taken on the standby SPE without the standby SPE performing a refresh of memory.

Help Messages

If the system technician presses HELP after entering "set vector" on a simplex system, the following message will be displayed:

286:

```
Enter a tape dump vector value: (0-F)


The tape dump vector value is a hex value representing restart levels
 A hex value of '1' causes tape dumps to be taken on WARM restarts
 A hex value of '2' causes tape dumps to be taken on COLDII restarts
 A hex value of '4' causes tape dumps to be taken on COLDI restarts
 A hex value of '8' causes tape dumps to be taken on REBOOT restarts


All other hex values represent a combination of restart levels.
 The combination is determined by adding the hex values of the individual
 restarts together (e.g. a hex value of '3' causes tape dumps to
 be taken on WARM and COLDII restarts, a hex value of 'F' causes tape
 dumps to be taken on WARM, COLDII, COLDI, and REBOOT restarts, etc.)
```

386:

```
Enter a memory dump vector value: (0-F)


The memory dump vector value is a hex value representing restart levels
 A hex value of '1' causes memory dumps to be taken on WARM restarts
 A hex value of '2' causes memory dumps to be taken on COLDII restarts
 A hex value of '4' causes memory dumps to be taken on COLDI restarts
 A hex value of '8' causes memory dumps to be taken on REBOOT restarts


All other hex values represent a combination of restart levels.
 The combination is determined by adding the hex values of the individual
 restarts together (e.g. a hex value of '3' causes memory dumps to
 be taken on WARM and COLDII restarts, a hex value of 'F' causes memory
 dumps to be taken on WARM, COLDII, COLDI, and REBOOT restarts, etc.)
```

If the system technician presses HELP after entering "set vector" on a duplex system, the following message will be displayed:

286:

```
Enter a tape dump vector value: (0-F),
  ['spe-active', 'spe-standby', 'spe-maint']


The tape dump vector value is a hex value representing restart levels
  A hex value of '1' causes tape dumps to be taken on WARM restarts
  A hex value of '2' causes tape dumps to be taken on COLDII restarts
  A hex value of '4' causes tape dumps to be taken on COLDI restarts
  A hex value of '8' causes tape dumps to be taken on REBOOT restarts


All other hex values represent a combination of restart levels.
  The combination is determined by adding the hex values of the individual
  restarts together (e.g. a hex value of '3' causes tape dumps to
  be taken on WARM and COLDII restarts, a hex value of 'F' causes tape
  dumps to be taken on WARM, COLDII, COLDI, and REBOOT restarts, etc.)
```

386:

```
Enter a memory dump vector value: (0-F),
  ['spe-active', 'spe-standby', 'spe-maint']


The memory dump vector value is a hex value representing restart levels
  A hex value of '1' causes memory dumps to be taken on WARM restarts
  A hex value of '2' causes memory dumps to be taken on COLDII restarts
  A hex value of '4' causes memory dumps to be taken on COLDI restarts
  A hex value of '8' causes memory dumps to be taken on REBOOT restarts


All other hex values represent a combination of restart levels.
  The combination is determined by adding the hex values of the individual
  restarts together (e.g. a hex value of '3' causes memory dumps to
  be taken on WARM and COLDII restarts, a hex value of 'F' causes memory
  dumps to be taken on WARM, COLDII, COLDI, and REBOOT restarts, etc.)
```

Error Messages

If the format of the condition (dump vector value) is invalid, the following message will be displayed:

`Entry invalid; please press HELP`

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

`'login id':'command' has a command conflict`

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

`Command resources busy; Press CANCEL to clear, and then resubmit`

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The following message indicates that the command completed successfully:

```
Command successfully completed
```

The following message indicates that the command failed:

```
Command failed
Error encountered, can't complete request FEATURE
INTERACTIONS
```

In a simplex SPE system, service will be disrupted while a core dump is being written to the primary Mass Storage System device. In addition, service will continue to be disrupted until the software is restarted at an appropriate level. These "disruption" times will vary depending upon the particular switch configuration.

If a core dump already exists on the file system (tape or memory card) subsequent core dumps will overwrite the existing core dump.

If the Mass Storage System is not accessible, a core dump can not be executed.

The vector will be cleared when a system restart of the proper level is performed regardless of whether the core is actually dumped.

If handshake is down in a High or Critical Reliability System and one of the "spe-active," "spe-standby," or "spe-maint" options is selected, the active vector will be set, but the standby vector will not be cleared. This could lead to two different vectors on the active and standby SPEs. Therefore, the "set vector" command should be reissued after handshake is up on the standby SPE.

If handshake is up in a High or Critical Reliability System, the active vector will be set and the standby vector will be cleared, or vice versa depending on the option that is selected.

status access-endpoint

This command displays the status of an access endpoint.

SYNOPSIS

status access-endpoint extension *print*

PERMISSIONS

The following default logins may execute this command: system technician, cust, inads, init, nms, browse.

EXAMPLES

status access-endpoint 25012
status access-endpoint 77868
status access-endpoint 66078 print

DESCRIPTION

The status access-endpoint command displays internal software state information for diagnosis. This command can help locate facilities with which an Access Endpoint is communicating.

Defaults

No defaults.

Parameters

extension	The extension number of the access endpoint to be displayed. The number of digits in an extension is determined by the dial-plan.
print	This will cause the report to be printed if a printer is connected to the SAT.

Help Messages

If the user presses HELP after entering "status access-endpoint," the following message is displayed:

```
Enter assigned extension, ['print']
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not an access endpoint, the following message will be displayed:

```
Extension assigned to object
other than access-endpoint
```

If the board that contains the access endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the EPN on which the access endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Extension	The extension of the access endpoint to be displayed.
(Starting) Port	Port locations (cabinet-carrier-slot-circuit) of the access endpoint. For wideband access endpoint, the location shown is that of the starting port.
Communication Type	The valid voice and data communication type that the access endpoint is administered. The options are: 56k-data, 64k-data, voice-grade-data, and wideband.
Width	For communication types of 56k-data, 64k-data, and voice-grade-data, the width value is 1. For communication type of wideband, this field displays the number of DS0s that makes up the access endpoint.
Service State	Whether the access endpoint is in-service or out-of-service. One of the following states is displayed: in-service/active, in-service/idle, and out-of-service.
Connected Ports	Port location connected to the access endpoint (cabinet-carrier-slot-circuit) for an active call. For wideband access endpoint connection, all ports connected to the wideband access endpoint are listed.

For the following output example, the command "status access-endpoint 22502" was entered. Assume that the access endpoint ports for extension 22502 are in cabinet 1, carrier C, slot 11, circuit 1 to 6. The access endpoint is connected on an active call to ports 7 to 12 of board in location 1B19 (cabinet 1, carrier B, slot 19). This means port 01C1101 is connected to 01B1907, port 01C1102 is connected to 01B1908, port 01C1103 is connected to 01B1909, and so on.

```
status access-endpoint 22502               page 1 of 1

      ACCESS-ENDPOINT STATUS


             Extension: 22502
      (Starting) Port: 01C1101
    Communication Type: wideband
                 Width: 6

         Service State: in-service/active

       Connected Ports: 01B1907 01B1908 01B1909
                        01B1910 01B1911 01B1912


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

status administered-connection

This commands displays the operational status of an administered connection.

SYNOPSIS

status administered-connection ac number *print*

PERMISSIONS

The following default logins may execute this command: rcust, cust, inads, init, system technician, browse, bcms.

EXAMPLES

status administered-connection 1
status administered-connection 50
status administered-connection 128 print

DESCRIPTION

An administered connection provides the ability to automatically establish an end-to-end connection between two access/data endpoints.

Parameters

ac number	The number assigned to an administered connection.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status administered-connection," the following message will be displayed:

```
Enter assigned administered connection number(1-128),
['print']
```

Error Messages

If the user entered administered-connection number is in the wrong format, the following error message is displayed:

```
Identifier invalid
```

If the user entered administered-connection number is out of range (not between 1 and 128), the following error message is displayed:

```
Entry out of range
```

If the user entered administered-connection number is not administered, the following error message is displayed:

```
Identifier not assigned
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered can’t complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Connection Number:	The number assigned to the administered connection.
Enabled?	Whether the administered connection is enabled ("y" or "n").
Originator:	The extension of the originating access/data endpoint.
Destination:	The destination address to be used in the routing of the administered connection.
Connection State:	The current status of the administered connection. Valid values are "connected," "restored," "failed," "waiting to retry," "attempting to restore," "attempting to connect," "not scheduled," and "disabled."
Failure Cause:	The cause of the state of the administered connection (that is, why the state is reported as attempting to connect, attempting to restore, or having failed to restore). If the administered connection was due to be active but is not connected, then this field shows the most recent reason for failure.
Number of Retries:	The number of consecutive failed establishment attempts.
Auto Restorable?	When an administered connection is in the connected state, this field indicated whether or not auto restoration is attempted when failure occurs.

For the following output example, the command status administered-connection 3 was entered.

```
status administered-connection 3                page 1 of 1

                 ADMINISTERED-CONNECTION STATUS


   Connection Number:
             Enabled?
          Originator:
         Destination:
    Connection State:
       Failure Cause:
   Number of Retries:
     Auto Restorable?
```

FEATURE INTERACTIONS

None.

status attendant

This command displays the status of the attendant console.

SYNOPSIS

status attendant console number *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, init, bcms, browse.

EXAMPLES

status attendant 1
status attendant 2
status attendant 2 print

DESCRIPTION

The status attendant command displays internal software state information for diagnosis. This command can help locate facilities to which the attendant console is communicating.

Defaults

No defaults.

Parameters

console number	The console number is a unique number assigned to a specific attendant (i.e. 1 - 16).
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status attendant," the following message will be displayed:

```
Enter assigned console(1-16), ['print']
```

Error Messages

If the entered console number is not a valid number from 1 through 16 the following message will be displayed:

```
Console number invalid
```

If the console number is not administered, the following error message will be displayed:

```
Console number not assigned
```

If a software fault is encountered while the command is executing, the following message will be displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then
resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Console Number	The specific number assigned to the attendant (1-16).
Port	The port location of the attendant (cabinet-carrier-slot-circuit).
Service State	In-service/idle, in-service/active, out of service, or disconnected.
Usage State	Idle or active.
Maintenance Busy State	Whether maintenance is testing the object.
Connected Ports	Port locations to which the attendant is communicating (cabinet-carrier-slot-circuit).

For the following output example, the command that was entered is "status attendant 1."

```
status attendant 1

       ATTENDANT STATUS

Console Number: 1            Service State: in-service/night service
          Port: 01C1106   Maintenance Busy? no
Connected Ports:

Command successfully completed
```

FEATURE INTERACTIONS

None.

status audits

This command will display the status of all of the Data Relation Audits that have detected a problem or that have aborted.

SYNOPSIS

status audits [peak-hour **|** cumulative] *[print | schedule]*

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

status audits cumulative
status audits cumulative print
status audits cumulative schedule
status audits peak-hour
status audits peak-hour print
status audits peak-hour schedule

DESCRIPTION

This command is used to display the results of the execution of the Data Relation Audits that are built into the switch. Data Relation Audits are used to check for inconsistencies between selected data items in the switch, to report any inconsistencies found and to take corrective action if possible. Data Relation Audits are useful during the development and testing phases of a project to help uncover software errors as well as in the field to help the switch recover from data corruption before that corruption causes an interruption in service.

This command displays the date and time of the beginning of the interval requested, the number of times that the full sequence of audits was executed (audit cycles), and status information about each audit that detected a problem or aborted during the specified interval. The status information contains the name of the audit, the number of times that the audit ran and corrected an error, the number of times that the audit ran and detected an error that it could not correct, the number of times that the audit ran and aborted for some reason, the date and time of the first problem detected by the audit (only for cumulative) and the time of the most recent error detected by the audit (only for cumulative).

The audit data is available since the last reboot or since the last execution of the "clear audits cumulative" command, and for the peak hour since the last reboot or since the last execution of the "clear audits peak-hour" or "clear audits cumulative" command. **Note: This data is not cleared on single process**

restarts, warm starts, cold 2 restarts, cold 1 restarts, or processor interchanges.

Audits can be executed directly using the "test MO" command (e.g. *test MO l 8192 p 512 t 0* will execute the Station Connections Audit, the audit lnames and numbers (pnames) are included in the Table Of Audits at the end of this main page). When the "test MO" command is used to execute an audit, the results of the audit are displayed on the terminal screen. In general, errors discovered as the result of a demand test are not logged in the error logs. To be consistent with other error logging and to avoid confusion, errors that are discovered as the result of a demand test executing an audit are not included in the data displayed by this command.

The screen does not automatically update, and is a reflection of the system at the time the request was made. More audits may have been run while the information is being displayed. These updates will not be reflected until the next execution of the command.

Defaults

None

Parameters

cumulative	This option will display the data collected since the last reboot or since the last execution of the "clear audits cumulative" command.
peak-hour	This option will display the data for the peak hour since the last reboot, or since the last execution of the "clear audits cumulative" or "clear audits peak-hour" command. The peak hour is determined by summing, for all audits, the number of times that the audit found and fixed a problem, the number of times that the audit found a problem that it could not fix and the number of times the audit aborted. The data for the hour with the highest number is displayed as the peak hour's data. If two peaks of the same size occur, the most recent is displayed.
print	If specified, this parameter will cause the information displayed by this command to be sent to the printer attached to the terminal as well as to the screen.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [3] for more details.

Help Messages

If the technician presses HELP after entering "status audits," the following message will be displayed:

```
cumulative  peak-hour
```

Error Messages

If the "print" option is specified and there is no printer attached to the terminal or if the printer is off line, then the following message will be displayed:

```
Printer failed
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The audit information will be displayed with one line of data displayed for each audit that has detected an error or aborted. The data for audits that have not detected any errors or aborted is not displayed since all of the numbers would be zero anyway. The output will be sorted in descending order based on the sum of the values in the "# Cycles Fixed Data," "# Cycles Could Not Fix Data" and "# Cycles Audit Aborted" fields for each audit.

Start Date	This field shows the date and time of the beginning of the interval being displayed. For "cumulative" it will be the date and time of the last reboot or of the last execution of the "clear audits cumulative" command. For "peak-hour" it will be the date and time of the beginning of the peak hour since the last reboot or since the last execution of a "clear audits cumulative" or "clear audits peak-hour" command.
# of Audit Cycles Completed	The switch executes the audits in a set order, one after another. When all of the audits have been executed, the switch starts over with the first one in the sequence. An audit cycle is one execution of all audits in the sequence of audits executed by the switch. This field shows how many audit cycles were completed in the specified interval. The number ranges from 0 to 999999, if it exceeds 999999 the string "******" will be displayed to indicate overflow. **NOTE:** Since this field shows the number of audit cycles completed, it is possible that the individual audit values, described below, could be larger than this value if the switch is part way through another audit cycle. Also, some audits are executed as part of scheduled maintenance instead of in the normal audit sequence, the Audit Cycles number does not apply to these audits.
Audit Name	This field shows the name of the audit that detected an error or aborted. There are a few audits that are not run in the normal sequence of audits. Instead, they are executed as part of scheduled maintenance. Those audits will be included in the reports but will be marked with "(SCH)" following the audit name.

# Cycles Fixed Data	This field shows the number of times that the audit ran, in the specified interval, and found a problem that it was able to fix. The number ranges from 0 to 65534, if it exceeds 65534 the string "*****" will be displayed to indicate overflow.
# Cycles Could Not Fix Data	This field shows the number of times that the audit ran, in the specified interval, and found a problem that it was not able to fix. The switch data being audited is left in an inconsistent state when this happens. The number ranges from 0 to 65534, if it exceeds 65534 the string "*****" will be displayed to indicate overflow.
# Cycles Audit Aborted	This field shows the number of times that the audit ran, in the specified interval, and aborted due to an internal error. The number ranges from 0 to 65534, if it exceeds 65534 the string "*****" will be displayed to indicate overflow.
First Error	This field shows the date and time that the audit first detected any of the three types of problems (i.e. fixed data, could not fix data, audit aborted) since the last execution of the "clear audits cumulative" command. The format used is: two digit month number followed by "/" followed by the two digit day of the month followed by "/" followed by the two digit hour in 24 hour time followed by ":" followed by the two digit minute (e.g. 03/27/14:31 for 2:31 pm, March 27th). **This field appears only on the "status audits cumulative" display.**
Most Recent Error	This field shows the date and time that the audit last detected any of the three types of problems. The format used is: two digit month number followed by "/" followed by the two digit day of the month followed by "/" followed by the two digit hour in 24 hour time followed by ":" followed by the two digit minute (e.g. 03/27/14:31 for 2:31 pm, March 27th). **This field appears only on the "status audits cumulative" display.**

The following are a sample outputs of the "status audits" command.

```
status audits cumulative

                         AUDIT STATUS INFORMATION

Start Date: 13:00 MON MAR 19 1990       # of Audit Cycles Completed: 67532

Audit     # Cycles    # Cycles Could    # Cycles       First      Most Recent
Name      Fixed Data   Not Fix Data   Audit Aborted    Error         Error

HTLK           0          *****             0       03/22/10:14  06/24/16:03
CR-AUDIT      135           0               0       03/22/10:12  06/10/19:17
HU-CALLS       2            0               0       03/22/10:12  03/22/10:20
SE-CALLS       1            0               1       03/22/10:13  03/22/19:14
TTR-SID        1            0               0       05/01/02:17  05/01/02:17
CO-CALLS       1            0               0       05/01/02:16  05/01/02:16
DE-CALLS       1            0               0       03/22/10:12  03/22/10:12
TR-QUE         1            0               0       04/05/13:05  04/05/13:05
CTRK           0            1               0       03/22/10:12  03/22/10:12
AT-ADM         1            0               0       03/22/10:12  03/22/10:12
CO-ADM         1            0               0       03/22/10:13  03/22/10:13
PC-ADM         1            0               0       04/05/15:05  04/05/15:05
PRI-USR (SCH)  1            0               0       03/22/10:14  03/22/10:14

Command successfully completed
```

```
status audits peak-hour

                          AUDIT STATUS INFORMATION

 Start Date: 10:00 MON MAR 22 1990    # of Audit Cycles Completed:  25

 Audit        # Cycles    # Cycles Could      # Cycles
 Name        Fixed Data    Not Fix Data     Audit Aborted
 HTLK             0             25               0
 HU-CALLS         2              0               0
 CR-AUDIT         1              0               0
 DE-CALLS         1              0               0
 CTRK             0              1               0
 AT-ADM           1              0               0
 CO-ADM           1              0               0
 SE-CALLS         0              0               1
 PRI-USR (SCH)    1             0                0

 Command successfully completed
```

FEATURE INTERACTIONS

The data displayed by "status audits cumulative" and "status audits peak-hour" can be affected by the "clear audits" command. The "clear audits cumulative" command clears the data collected to date and resets the start time kept for that data and also clears the peak hour's data. The "clear audits peak-hour" command clears the data kept for the peak hour so that a new peak hour can be established.

When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. Refer to the Report Scheduler and System Printer feature specification [3] for details about the scheduling form.

TABLE OF AUDITS

The following table shows the names of the audits that are run as part of time available maintenance, the audit number (pname) and a short description of each audit. These audits are executed using lname MO_DR_AUDIT (8192). These audits may be executed using the *test MO* command with lname 8192, pname "audit number," and test number 0 (for example, *test MO l 8192 p 607 t 0* will execute the AC state audit).

Audit Name	Audit Number	Description
AC-ISG	607	AC state audit
ADJUSR	595	Adjunct user record audit
ADMTRM	559	Administration terminal audit
ANUR-A	589	Announcement user record audit
AN-ADM	574	Announcement group administration audit
AN-CALLS	572	Announcement group calls audit
AN-QUE	577	Announcement group queue audit
AQSA	545	ACB queue slot allocation audit
ASLINK	606	ASAI link status audit
ASYLED	605	ASAI yellow LED audit
ATACT	558	Attendant active audit
ATAV	557	Attendant availability audit
ATDRCNT	576	Attendant resource count audit
AT-ADM	529	Attendant group administration audit

Continued on next page

Audit Name	Audit Number	Description
AT-CALLS	515	Attendant group calls audit
AT-QUE	523	Attendant group queue audit
AUR-A	540	Attendant user record audit
AU-CIDP	596	Announcement user cid/port audit
AWOH-UR	614	Admin Without Hardware Split User Record Audit
B2B-TAB	617	Board-to-Board Link Audit
BR-CALLS	629	Bridged extensions audit
BUTLK	560	Button lock audit
CALK	569	Coverage answer member lock audit
CATT	527	Attendant connections audit
CCTRTAB	624	Call Classifier Tone Receiver Table Audit
CCTR-SID	600	Call classifier tone receiver audit
CDM	528	Data module connections audit
CO-ADM	530	Coverage group administration audit
CO-CALLS	516	Coverage group calls audit
CPROC	585	Call process/call record audit
CPTRTAB	623	Call Progress Tone Receiver Table Audit
CPTR-SID	601	Call progress tone receiver audit
CPWAKEUP	586	Wake up call process audit
CR-AUDIT	513	Call processing data audit
CSR-A	544	Connection service record audit
CSTAT	512	Station connections audit
CTRK	526	Trunk connections audit
DA-CALLS	583	DAP call record audit
DA-MSG	584	DAP message buffer audit
DE-ADM	531	Data extension group administration audit
DE-CALLS	517	Data extension group calls audit
DMLK	563	Data module lock audit
DUR-A	543	Data user record audit

Continued on next page

Audit Name	Audit Number	Description
DXLK	567	Data extension member lock audit
EI-TAB	621	Expansion Interface Table Audit
FHT	554	Facility status hundreds table audit
FTED	553	Facility status tracked user audit
FTING	552	Facility tracking user audit
FTSRA	593	Fiber time-slot record allocation audit
GIP-TIMER	609	GIP Timer Audit
HTLK	568	Hunt member lock audit
HU-ADM	532	Hunt group administration audit
HU-CALLS	518	Hunt group calls audit
HU-QUE	524	Hunt group queue audit
IAP-CALLS	590	IAP call record audit
IAP-URB	591	IAP user record audit
IM-HMM	579	HMM image table audit
INST-LNK	604	Instigator/down-link user link audit
ISGR-A	594	ISG call record audit
LOG-A	570	MDM error/alarm log audit
MAP-HMM	580	HMM map status table audit
MCT-ADM	561	Malicious call trace administration audit
MIS-FAC	587	MIS facility state audit
MP-ADM	575	Modem pool group administration audit
MP-CALLS	573	Modem pool group calls audit
MSGQ-HMM	582	HMM map request queue audit
MST-LOG	549	MST Logging Buffer Audit
MST-STATE	546	MST State Audit
MS-CALLS	588	MISAP call record audit
MUV	555	Message user verification audit
MWIA	550	Message waiting indicator audit
MWL-NOAP	599	Message waiting lamp no AP audit

Continued on next page

Audit Name	Audit Number	Description
PA-ADM	533	Paging group administration audit
PA-CALLS	519	Paging group calls audit
PCLK	566	PCOL member lock audit
PC-ADM	535	Personal CO line group administration audit
PC-CALLS	521	Personal CO line group calls audit
PINC-TAB	612	Packet Inter-Port Network Connection Sub-Table audit
PI-ADM	534	Pickup group administration audit
PLIP-LNK	602	LIP link audit
PN-HMM	578	HMM pname table audit
PRI-CR	598	PRI call record audit
PRI-TBUF	592	TSCUUI buffer audit
PUR-A	541	Phantom user record audit
SDSBUF	581	Service dispatcher stim buffer audit
SDSID	571	Service dispatcher SID audit
SE-ADM	538	Terminating extension group administration audit
SE-CALLS	537	Terminating extension group calls audit
STNLK	562	Station lock audit
SUR-A	539	Station user record audit
S-INC-TAB	611	Service Inter-Port Network Connection Sub-Table audit
S-PT-TAB	610	Service-Port Connection Sub-Table audit
S-TAB	620	Service Table Audit
TEGLK	565	TEG member lock audit
TKLK	564	Trunk lock audit
TONE-TS	608	Tone Time Slot Subtable Audit
TR-ADM	536	Trunk group administration audit
TR-CALLS	522	Trunk group calls audit
TR-QUE	525	Trunk group queue audit
TSC-PRI	520	ISDN-PRI TSC resource audit

Continued on next page

Audit Name	Audit Number	Description
TSRA	547	Time slot record allocation audit
TTI-STATE	618	TTI State Audit
TTI-TRANS	619	TTI Translation Audit
TTR-SID	514	Touch tone receiver audit
TTR-TAB	622	Touch Tone Receiver Table Audit
TUR-A	542	Trunk user record audit
T-TS-TAB	613	Tone Time Slot Connection Sub-Table Audit
UGMA	551	User group membership audit
UPUSR-LNK	603	Up-link user link record audit
URMB	548	User record maintenance busy audit
X25-CHAN	615	X.25 Channel Status Audit
X25-LINK	616	X.25 Link Status Audit

The following table shows the names of the audits that are run as part of scheduled maintenance, the audit number (pname) and a short description of each audit. These audits are executed using lname MO_SCH_AUDIT (8193). These audits may be executed using the *test MO* command with lname 8193, pname "audit number," and test number 0 (for example, *test MO l 8193 p 556 t 0* will execute the Message Waiting Lamp Audit audit).

Audit Name	Audit Number	Description
MWL	556	Message Waiting Lamp Audit
PRI-USR	597	PRI user record audit
SUR-FREE	625	Station User Record Free List Audit

status bri-port

This command displays the current states of the specified ISDN-BRI port.

SYNOPSIS

status bri-port location *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms, browse.

EXAMPLES

status bri-port 1c0701
status bri-port 1c0701 print

DESCRIPTION

The status bri-port command displays the service state, maintenance state and layer 1 state of an ISDN-BRI port. Also displayed on this form is information on the point-to-point signaling links transported over the port.

Defaults

None.

Parameters

location	A "location" represents the physical position of the port to be busied out and is entered as "UUcSSpp" where "UU" represents the cabinet number (1-3), "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit (port).
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status bri," the following is displayed:

```
Enter an isdn-bri port location, ['print']
```

Error Messages

If the format of the port location is incorrect, the following message is displayed:

```
Port/Board invalid
```

If the port location entered is not between 5 and 7 characters long, the following message is displayed:

```
Port invalid
```

If the port is not administered, the following message is displayed:

```
Port not assigned
```

If the board associated with the entered port location is not inserted, the following message is displayed:

```
Board not inserted
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port:	This field specifies the physical address of the ISDN-BRI port.
Service State:	This field specifies whether the ISDN-BRI port is "in-service" or "out-of-service."
Maintenance Busy?:	This field specifies whether there is any maintenance testing being performed upon the ISDN-BRI port ("yes" or "no").
Layer 1 State:	This field contains the layer 1 (physical) state of the BRI on the port. Valid states are "activated," "pend-activation," and "deactivated." ■ The "activated" state means layer 1 frames are being passed between the port and BRI endpoints. ■ The "pend-activation" state specifies that the port has been placed in-service, the layer 1 interface device has been turned on, layer 1 frames are being sent to the BRI endpoints connected to this port, but the BRI endpoints are not responding. ■ The "deactivated" state means that the layer 1 interface device on the BRI has been turned off due to the port going out-of-service.
TEI Value	The Terminal Endpoint Identifier(TEI) is a layer 2 addressing parameter used by the switch to pass information over the point-to-point signaling link to and from BRI endpoints. Each point-to-point signaling link has a TEI associated with it. This field displays the value of this addressing parameter. This value is in the range from 0 to 127.

Layer2 State:	This field contains the point-to-point signaling link layer 2 state. Valid states are "un-assigned," "assigned," "established," "l3-established" or "hyperactive."

- The states of "un-assigned" means the link is in the TEI-UNASSIGN state at Layer 2.
- The "assigned" state specifies the link is currently in the AWAIT_EST (Await Establish) state at layer 2. If the BRI endpoint supports TEI allocation procedures, this state means that those procedures have been successfully executed and a TEI has been assigned to the endpoint by the switch.
- The state of "established" signifies that the link is in the MF_EST_NORM (Multi-Frame Established Normal) state at layer 2. This state means that the switch has successfully started the link and is now capable of exchanging layer 3 frames with the endpoint. If the endpoint does not support SPID initialization procedures, the extension of the endpoint associated with the link is also displayed. This is the normal state for the link in the point-to-point wiring configuration.
- A state of "13-established" shows that the link is in the MF_EST_NORM state at layer 2 and SPID initialization procedures have been completed successfully. The extension of the endpoint associated with the link is also displayed. This is the normal state for the link in the multi-point wiring configuration.
- The state of "hyperactive" means that traffic on this link has gone over threshold. The link has been suspended and deemed hyperactive.

Endpt Extension	This field displays the extension of the voice/data endpoint associated with the link only if the link is in the "established" (point-to-point configuration) or "l3-established" (multipoint configuration) layer 2 states, otherwise this field is blank.
Endpt SPID	This field displays the SPID administered on the voice/data endpoint associated with the link. Note that this information is displayed only if the link is in either the "established" (point-to-point configuration) or the "13-established" (multipoint configuration) layer 2 state. Otherwise this field is blank.

Service SPID	This field displays an indication as to whether the link is associated with the Service SPID. If the link is associated with the Service SPID this field contains a "yes" and the endpoint extension field is blank, otherwise this field is blank. Service SPID is a feature used by service technicians to check building wiring between the switch and the BRI endpoint.

For the following output example, the command status bri-port 1c1701 was entered.

```
status bri-port 1c1701                Page 1 of  1  SPE A

                          STATUS BRI-PORT

             Port: 01C1701
    Service State: in-service
Maintenance Busy?: no
    Layer 1 State: activated

     TEI Value  Layer2 State   Endpt Extension   Endpt SPID   Service SPID?

Link1   64      13-established      1010            1010

Link2

Link3
```

STATUS INTERPRETATION SECTION

The meaning of the information on the status bri-port form is as follows.

Table 10-6. Status BRI-Port Command Interpretation

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
ASAI, BRI	0-126	Assigned	blank	blank	Transitory state for BRI endpoints and ASAI adjuncts. Link establishment is being attempted by the switch. 1. Check the endpoint and wiring by following the SPID Facility Test Procedure described in the BRI-SET (ISDN-BRI Set/ASAI Adjunct) Maintenance documentation. 2. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established for ASAI adjuncts and BRI endpoints supporting MIM (management information messages) initialization and Established for fixed TEIBRI endpoints and automatic TEIBRI endpoints not supporting MIM initialization. Otherwise, proceed to Step 3. **NOTE:** A MIM is a level-3 message that conveys management and maintenance information between a communications system and a BRI terminal. 3. Escalate the problem to the next tier.

Continued on next page

Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
ASAI	0-63	Established	blank	blank	Transitory state for ASAI adjuncts. ASAI signaling is connected at Layer 2. Layer 3 Restart procedure has not completed between switch and adjunct. 1. Check the adjunct by following the recommended repair procedures of the manufacturer. 2. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 3. 3. Escalate the problem to the next tier.
BRI	0-126	Established	ext	blank	Normal state for non-MIM initializing, fixed and automatic TEIBRI endpoints.

Continued on next page

Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
BRI, ASAI	64-126	Established	blank	blank	Transitory state for automatic TEIBRI endpoints which support MIM initialization. 1. Verify that SPID administration on the switch and endpoint are consistent. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, proceed to Step 2. 2. Try replacing the endpoint. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, proceed to Step 3. 3. Escalate the problem to the next tier.
BRI	64-126	L3-Established	ext	blank	Normal state for automatic TEIBRI endpoints supporting MIM initialization.
BRI, ASAI	64-126	L3-Established	blank	yes	SPID Facility Test is being conducted on the port by system technician. Link is not associated with a BRI endpoint on the port. See description of SPID Facility Test Procedures described in the BRI-SET (ISDN-BRI Set/ASAI Adjunct) Maintenance documentation.

Continued on next page

Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
BRI	64-126	L3-Established	ext	yes	SPID Facility Test is being conducted on the port by system technician. Link is associated with an endpoint on the port. See description of SPID Facility Test Procedures described in the BRI-SET (ISDN-BRI Set/ASAI Adjunct) Maintenance documentation.
BRI	0-126	L3-Established	blank	blank	Invalid SPID assigned to link. 1. Change the SPID value in the BRI endpoint to match the SPID administered to the BRI endpoint on the port. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the BRI endpoint is L3-Established. Otherwise, go to Step 2. 2. Escalate the problem to the next tier.

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Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
BRI *(cont'd)*	0-126	L3-Assigned	ext	blank	Transitory state for BRI endpoints which support MIM initialization. 3. Wait for five seconds and repeat the command. If the state has not changed, continue with Step 2. 4. Make sure SPID administration on the switch and endpoint are consistent. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 3. 5. Try replacing the endpoint. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 4. 6. Escalate the problem to the next tier.

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Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
BRI *(cont'd)*	0-126	L3-Assigned	ext	yes	Transitory state for BRI endpoints which support MIM initialization when SPID Facility Test was used to initialize the station. 7. Wait for five seconds and repeat the command. If the state has not changed, continue with Step 2. 8. Make sure SPID administration on the switch and endpoints are consistent. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 3. 9. Try replacing the endpoint. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 4. 10. Escalate the problem to the next tier.
ASAI	0-126	Hyperactive	ignore	ignore	Link has sent too many messages per unit time.

Continued on next page

Table 10-6. Status BRI-Port Command Interpretation — *Continued*

Endpoint Types	TEI Range	Layer 2 State	Voice Extension	Service SPID	Description / Recommendation
BRI					Signaling has been suspended. System timeouts in 60 seconds and attempts to place the link in service again. If a link remains in this state while there is no activity at the BRI endpoint: 1. Make sure SPID administration on the switch and endpoints are consistent. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 2. 2. Try replacing the endpoint. Verify the repair by executing the **status bri-port PCSSpp** command. Determine that the L2 state of the signaling link is L3-Established. Otherwise, go to Step 3. 3) Escalate the problem to the next tier.
ASAI	0-126	L3-Restarting	ext		The switch has sent a Restart message to the adjunct but has not yet received a Restart Acknowledgment message from the adjunct.
ASAI	0-126	L3-Restarted	ext		After receiving a Restart Acknowledgment message, the switch has sent a Heartbeat message to the adjunct and is waiting for a response.
ASAI	0-126	L3-Established	ext		Normal state for ASAI adjunct.

FEATURE INTERACTIONS

None.

status card-mem

This command views the status of the memory card located at the specified SPE.

SYNOPSIS

status card-mem location print

PERMISSIONS

The following default logins may execute this command: cust, init, inads, system technician, nms, rcust, browse, and bcms.

EXAMPLES

status card-mem
status card-mem A
status card-mem b print

DESCRIPTION

Memory card is a portable and compact memory card containing a bank of flash EPROM chips. The non-volatile memory card can be erased and randomly programmed with user’s data. In 386 systems [G3iV2-386, G3sV2, G3vsV2], the memory card replaces the traditional tape system as a mass storage for saving translation, announcements, and core dump. The system software is stored in the "flash" section of main memory and the memory card used for saving translations doesn’t contain a copy of the system software as the tape does. During the system reboot or a system power down condition, the in-core system maintenance hardware error logs are temporarily saved in the memory card before the system goes down and then the error logs file is read back when the system is restarted. The Hard Patch feature also uses the memory card as a temporary storage when LMM applies a patched file to the system software.

The "status card-mem" command can show the following information of a memory card located at either active SPE or standby SPE:

- Is a valid memory card in place?
- Is the memory card write-protected?
- What is the capacity of the inserted memory card?
- What kind of system configuration - small or medium?
- What is the number of pulses counted in the last erase operation?

- What is the percentage of translation storage space used?
- What are the names of files stored in the memory card, and what is date and time (if available) when it was saved?

Defaults

None.

Parameters

location	This parameter indicates the carrier location where the memory card resides in a High or Critical Reliability System. This field is not required in a simplex switch configuration. In a duplex switch configuration, this field is required and it can be either "A" for control carrier A in Processor Port Network (PPN) or "B" for control carrier B in PPN.
print	Print the status on the printer attached to the SAT.

Help Messages

If the system technician presses HELP after entering "status card-mem," the following message is displayed for a duplex system:

```
Enter [cabinet(1)];carrier(A-B), ['print']
['print']
```

Error Messages

If the carrier entered is invalid, the following message will be displayed:

```
"entered value" is an invalid identifier;
press RETURN to execute modified command
```

If the NETCON board is not TN777B, then the following message will be displayed:

```
Must install TN777B circuit pack
```

If the system is insane, the following message will be displayed:

```
Error encountered, can't complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

OUTPUT

Location	This field indicates the physical location (carrier) of the memory card. In a simplex system, the "Location" always has the value "01A" for carrier A of Processor Port Network. In a High or Critical Reliability System, either "01A" or "01B" can be displayed.
System Size	The "System Size" field reflects the system configuration - **Small** [G3sV2] or **Medium** [G3iV2-386]. This information will be useful for catching errors such as inserting wrong size of memory card into the system.
Capacity	The "Capacity" field shows the capacity of the inserted memory card and the series number of the memory card. This field has a 3-digit format for the size of memory card and the 1-digit format for the series number. Three different capacities of memory cards are used in DEFINITY D92 system. The file contents of each type of memory card are described in the following table.

Capacity of Memory Card

Card Size	User	Customer File Names
1 Mb	Small w/o Announcements	translation
4 Mb	Medium w/o Announcements	translation
4 Mb	Small and Medium with Announcements	translation announcements
10 Mb	Maintenance (core dump)	translation announcements core_ dump
10 Mb	System Upgrade	system_software

Status	The possible values for the "Status" field are: **"inserted"**a valid memory card is in the memory card slot **"no card"**no memory card is inserted or the inserted memory card has a bad connection **"unformatted"**the inserted memory card is unformatted or can not be recognized by the switch Only when the status is "**inserted**," the switch can perform I/O operation to the memory card
Write-Protection	The "Write-Protection" field has a value "**on**" when the write-protection toggle on the memory card is turned on. Otherwise, the field is "**off**." If the "Write-Protection" field is "**on**," then the switch can not store any file to the memory card.
Number of Erase Pulses	This field contains the number of pulses counted in the last erase operation on a Series 1 type of memory card. This field is blank for Series 2 type of memory card due to the different algorithm of erase operation between two series.
Translation Storage Space Used (%)	Indicates the percentage of reserved storage space for storing translation file in the memory card that has been used for saving the translation into the memory card.

NOTE:
This percentage is valid only for the specific memory card used in the *most recent* save translation operation (which is implemented via the **save translation** command or via the scheduled maintenance with save translation enabled). If the memory card is replaced with another card, or if no save translation is performed on the new memory card, the percentage does **not** indicate the translation storage space used in the new card. Therefore, in such a case, the percentage can be ignored.

File Name	Each formatted memory card has reserved a fixed space in the card for each file. The starting address and size of each reserved slot is pre-determined according to the capacity of the memory card. The file name as defined in Table "Capacity of Memory Card" is shown in this field.
Data Present	The "Data Present" field is "y" when the file contains valid data. Otherwise, the "Data Present" field has a value of "n."
Date Time	This field shows the date and time when the file was saved into the memory card. For the "Software Upgrade" type of memory card, this field contains the system software release number instead of the time stamp. Due to the restriction of "core dump" file format, the year information is not available in the date/time string.

For the following output example, the command "status card-mem" was entered.

```
status card-mem

                        MEMORY CARD STATUS

     Location: 01A               Write Protection: off
       Status: inserted             Capacity (MB): 4 Series 1
  System Size: Medium      Number of Erase Pulses: 78
             Translation Storage Space Used (%): 21


   File Name    Data Present    Date     Time
   translation       y         2/17/91   9:00
   announcements     y         2/15/91  20:30

Command successfully completed
```

FEATURE INTERACTIONS

If the Announcement feature is not available in the system features configuration, then the "Data Present" field is always "n" for the "announcements" file. The Announcement feature requires a memory card with a minimum capacity of 4 MB. If the memory card is less than 4 MB, then the Announcements can not be saved in the memory card.

The Core Dump feature requires a 10 MB memory card for saving the core dump. If the memory card has a capacity less than 10 MB, then the core dump operation will fail.

status cdr-link

This command displays the status of the call detail recording (CDR) links.

SYNOPSIS

status cdr-link *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, nms, browse.

EXAMPLES

status cdr-link
status cdr-link print

DESCRIPTION

The status cdr-link command displays the status of call detail recording (CDR) links. Whether the link is up or down will be displayed. If a link is down, the number of times the switch has tried to set up the link will be shown.

The call detail recording (CDR) link is the physical link connecting the SPE to a recording device (for example, printer) for sending CDR call records. A CDR link is composed of a data channel on the NETCON board or EIA port on the processor circuit pack, a digital port and a data module. There can be up to two CDR links in the system.

Defaults

No defaults.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status cdr-link", the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Link State	Up, down, or extension not administered will be displayed. *Up* means the link is up and the application can use the link. This is the normal state of operation. *Down* means the link is physically down. *Extension not administered* means you need to administer the *system cdr feature* form.
Number of Retries	The number of times the switch has tried to set up the link.
Maintenance Busy	Whether the maintenance object has been busied out or not. Will be set to either *yes* or *no*.

The following is an example of the fields contained on the output form.

```
status cdr-link

                       CDR LINK STATUS

         Primary                   Secondary
       Link State: up              extension not administered
Number of Retries: 0
 Maintenance Busy? no
```

FEATURE INTERACTIONS

None.

status data-module

This command displays the status of a data-module.

SYNOPSIS

status data-module extension *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

status data-module 30000
status data-module 32770
status data-module 32770 print

DESCRIPTION

The status data-module command displays internal software state information for diagnosis. This command can help locate facilities to which the data module is communicating.

Defaults

No defaults.

Parameters

extension	The extension of the data module to be displayed. The number of digits in an extension is determined by a dial-plan.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status data-module", the following message will be displayed:

```
Enter assigned extension, ['print']
```

Error Messages

If the format of the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the extension is not a data module, the following message will be displayed:

```
Extension exists but assigned to a different object
```

If software fails to complete the command, one of the following messages will be displayed:

```
No tests for this MO
EPN is not available
Board not assigned
Port not assigned
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Data Ext/Sta Ext for Stn DM	The data module extension number. The DTDM is an exception: the connected station extension will be shown instead.
Port/Channel Number	The port location of the data module (cabinet-carrier-slot-circuit). If the data module specified is a data channel, the channel number will be shown instead.
Service State	This entry displays the status of the data module; valid states are: — In-service/idle — The data module is present but not in use. — In-service/active — The data module is present and is in use. — Out-of-service — The data module has been removed from service — Disconnected — The data module no longer appears to be present
CF Destination Ext	This entry displays the call forwarding destination, if any, of the station.
Maintenance Busy?	Whether maintenance is testing the object, "yes" or "no".
Connected Ports	Port locations to which the data module is connected (cabinet-carrier-slot-circuit).

For the following output example, the command that was entered is "status data-module 301".

```
status data-module 301

                          DATA-MODULE STATUS

Data Ext/Stn Ext for Stn DM: 301        Service State: out-of-service
        Port/Channel Number: 01C1103    Maintenance Busy? no
         CF Destination Ext:
            Connected Ports:
```

FEATURE INTERACTIONS

None.

status hardware-group

This command displays the status of the hardware group maintenance test.

SYNOPSIS

status hardware-group *print*

PERMISSIONS

The following default logins may execute this command: bcms, browse, system technician, inads, cust, init, rcust.

EXAMPLES

status hardware-group
status hardware-group print

DESCRIPTION

Summary information on the active or last hardware group tests will be displayed. This display includes the number and percentage of maintenance objects tested, the percentage of tests passed, failed, and aborted, the time elapsed since initiating the hardware group test, the specific hardware group test command (see "test hardware-group" command) initiated, and the state (active/canceled/complete) of the hardware-group test.

Defaults

No defaults.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status hardware-group", the following message will be displayed:

['print']

OUTPUT

Hardware Group Command State:	The state of a hardware-group command: "active" - if testing is in progress, "canceled" - if testing has been canceled, "complete" - if the command has completed and there is no testing going on.
Number of MOs Tested:	The number of MOs in the specified group (refer to test hardware-group command) that have had been tested by the current hardware-group command. This includes all MOs that were either actually tested or were aborted due to resource contention.
Total Number of MOs to be Tested:	The total number of MOs in the group that was specified in the "test hardware-group" command.
Percent Complete:	A ratio of the number of MOs completed and the total number of MOs to test in the command.
Elapsed Test Time:	The duration of the hardware-group test. If a test was canceled and then restarted this time excludes the cancel period. If the hardware-group command has finished it will indicate the length of time it took to complete the command. The time is displayed in the HH:MM:SS format where HH is hours, MM is minutes, and SS is seconds.
Repetition Number	The number of iterations that have been completed corresponding to the 'repeat' or the 'continuously' option.
Percentage of Tests Passed:	The percentage of tests that passed.
Percentage of Tests Failed:	The percentage of tests that failed.
Percentage of Tests Aborted:	The percentage of tests that were aborted.
Command:	The hardware-group action object and qualifiers that were entered.
Test sequence:	This will display either short or long.

Test repetition:	This will display either continuously or the keyword repeat along with the repeat value entered.
Output options:	This will display the selections that were chosen on the input form: auto-page, background, or failures.
Hardware options:	This will display the selections that were chosen on the input form: all-ports, or SPE-interchange.

For the following output example, the command "status hardware-group" was entered.

```
status hardware-group                        page 1 of 1

                  HARDWARE GROUP STATUS

          Hardware Group Command State:   active
                  Number of MOs Tested:   11070
      Total Number of MOs to be Tested:   12300
                      Percent Complete:      90%
        Elapsed Test Time (hr:min:sec): 0:15:30
                     Repetition Number:       1
            Percentage of Tests Passed:      82%
            Percentage of Tests Failed:      11%
           Percentage of Tests Aborted:       7%


              ENTERED HARDWARE GROUP COMMAND

         Command: test hardware-group system
   Test sequence: short
 Test repetition: repeat 3
  Output Options: failures
Hardware Options: SPE-interchange
```

FEATURE INTERACTIONS

None.

status health

This command displays the status of the overall health of the system.

SYNOPSIS

status health *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms, browse.

EXAMPLES

status health
status health print

DESCRIPTION

The status health command displays the current system alarm summary, maintenance busy summary, user summary, critical system status, and cabinet status. This is the same page that is displayed when "monitor health" is entered, except with the "status health" command the output page is not updated periodically.

Defaults

None.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status health", the following object command word choices will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Major	The number of logged major alarms is displayed as a number ranging from 0 to 200. Up to 200 major alarms can be reported in the alarm log; therefore, this is the maximum which can be displayed.
Minor	The number of logged minor alarms is displayed as a number ranging from 0 to 200. Up to 200 minor alarms can be reported in the alarm log; therefore, this is the maximum which can be displayed.
Warning	The number of warnings logged in the alarm file is displayed as a value between 0 and 200, which is the maximum number of warnings permitted.
Trunks	The number of maintenance busied out trunks is shown.
Stations	The number of maintenance busied out stations is displayed.
Others	The combined number of maintenance busied out objects excluding trunks and stations is displayed.
Static	Static indicates the proportion of the CPU which is currently dedicated to high priority items (for example, the operating system). This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (for example, an occupancy of 89.6% would be displayed as 90%).
SM	SM indicates the proportion of the CPU which is currently dedicated to system management or periodic and scheduled maintenance. Therefore, if there is a large amount of periodic or scheduled maintenance testing being performed, this occupancy percentage can be high without affecting service. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (for example, an occupancy of 89.6% would be displayed as 90%).

CP	CP indicates the proportion of the CPU which is currently dedicated to call processing. This occupancy has priority over SM and IDLE occupancy categories and if needed, will take processor time away from these occupancy categories. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (for example, an occupancy of 89.6% would be displayed as 90%).
Idle	Idle indicates the proportion of the CPU which is currently available for use. This percentage is rounded to the nearest integer, therefore a percentage of 0 means that the occupancy is less than one half of a percent (for example, an occupancy of 89.6% would be displayed as 90%).
Active SPE	A or B is displayed to indicate the currently active processor complex. When the active processor complex is locked on-line via lock switching on DUPINT, the "lock" option will be displayed; otherwise, "auto" will be shown.
Duplicated?	The duplication status of the SPE component is indicated. "y" indicates duplication and "n" indicates no duplication.
SPE Power	The current source of power for the processor complex is indicated. The normal state is "commercial". When commercial power is not available, battery backup is in use and will be indicated by "backup".
Time Source	The current timing source is displayed. The display values for this field vary according to the timing source selected. If the site has administered the optional Stratum-3 hardware, "external" will be displayed under normal operating conditions and "internal" will be displayed when an internal source, such as a tone clock, is used. Primary and secondary timing sources must be administered when using the Stratum-4 option. "primary" is displayed when the primary administered source is in use, and "secondary" is displayed when the administered secondary source is in use. When neither the primary or secondary sources are in use, "local" will be displayed.
# Logins	The number of current users is displayed.
Cab	The assigned cabinet number, ranging from 1 to the highest cabinet number in the system, is displayed on the screen.

Emerg Trans	The current setting of the emergency transfer switch on the maintenance board is indicated for each cabinet. Five options are available: auto-on ("auto+" or "a+"), auto-off ("auto-" or "a-"), "on", "off", and "n.a.". Normally, the "auto+" or "auto-" option is enabled. In this state, emergency transfer will be activated automatically upon cabinet failure (The "+" indicates that emergency transfer is currently activated, while the "-" indicates that emergency transfer is currently not activated). When "on" is displayed, emergency transfer is automatically activated. The "off" option shows that the cabinet is prevented from activating emergency transfer. In a system equipped with duplicated SPEs, the switch settings for both processors of the PPN (cabinet 1) will be displayed. In this case, "auto+" will be abbreviated "a+", "auto-" will be abbreviated "a-", and "off" will be abbreviated as "of". "on" will not be changed. If "n.a." is displayed, the emergency transfer switch setting is not available.
Mj	The individual number of major alarms associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
Mn	The individual number of minor alarms associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
Wn	The individual number of associated with the cabinet is indicated. An asterisk is used to fill the field when the number exceeds 99.
PNC	Current Port Network Connectivity (PNC) status for each of the port networks within a cabinet is displayed. When multiple port networks exist within a cabinet, Carriers A, B, and C are listed first and separated from Carriers D and E by a slash (for example, up/up). PNC status of a port network is determined on the basis of availability of the Expansion Archangel Link (EAL). An "up" denotes that the EAL is available. When the EAL is not available, then a "dn" (down) is displayed.
Time of Day	The current time of day acquired from the system is displayed.

For the following output example, the command "status health" was entered.

```
status health

SPE: A/Auto    B/functional             OCC:  ST:  9%   Cp: 25%  Sm: 10%  Idl:66%
PNC: A-PNC/Auto B-PNC/functional   ALARM:Maj:  0   Min: 2  Wrn:  9
Pwr: Comm   Sync:local   Logins:4   BUSYOUTS:Trk:  0   Stn:  0   Oth:  0
Cab  EmTr  Mj  Mn  Wn  PNC  Cab  EmTr  Mj  Mn  PNC  Cab EmTr  Mj  Mn  Wn  PNC
1    off   0|  7|  0   up
2    off   0|  0|  4   up
3    nia   0|  2|  0   up
                            -Press CANCEL to quit -   9:33 THU APR 16 :1993
```

FEATURE INTERACTIONS

In a High or Critical Reliability System, if the standby SPE Emergency Transfer Select Switch is changed and handshake is down, the displayed Emerg Trans field will be incorrect until handshake comes up again.

status interface

This command displays the current value of a number of counters maintained by the processor interface (PI). The information displayed by this command is only useful to development environment.

SYNOPSIS

status interface location *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse, bcms, rcust.

EXAMPLES

status interface a1
status interface 01a2
status interface 01b1
status interface b2
status interface b2 print

DESCRIPTION

The status interface command displays the current value of a number of counters maintained by the PI, which is a front end processor implementing the packet layer and link layer of the BX.25 protocol and the integrated services digital network (ISDN) procedure-D protocol.

Defaults

The cabinet number defaults to one (1) if it is not specified.

Parameters

location	The location (cabinet-carrier-position) of the processor interface (PI board). A position of 1 is the first processor interface in the carrier, while a position of 2 is the second processor interface in the carrier.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status interface", the following message will be displayed:

```
Enter location: [cabinet(1)], carrier (A-B),
          position(1-2); ['print']
```

Error Messages

If the specified carrier is not the active PE, the following message will be displayed:

```
Port invalid
```

If the technician-entered cabinet and carrier is invalid for a PPN, the following message will be displayed:

```
Entry is bad
```

If the technician-entered carrier is not a valid carrier, the following message will be displayed:

```
Invalid carrier specified
```

If the technician-entered carrier is not active, the following error message will be entered:

```
Board invalid
```

If the specified carrier/position processor interface circuit pack is not inserted, but the specified carrier is active, the following error message will be displayed:

```
Processor Interface (TN765) not
  started or is being started
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Base Level Occupancy (Low)

Base Level Occupancy (High)

Primary Queue Audit Error

Secondary Queue Audit Error

Translation Audit Error

Protocol Timer Audit Error

Hardware Sanity Timeout

Hardware Resource Error

Hardware Overload Error

The following is an example of the fields contained on the output form.

```
status interface a1

                 PROCESSOR INTERFACE STATUS

       Base Level Occupancy(low): 10
      Base Level Occupancy(high): 25
       Primary Queue Audit Error: 4
     Secondary Queue Audit Error: 10
         Translation Audit Error: 12
      Protocol Timer Audit Error: 0
         Hardware Sanity Timeout: 1
         Hardware Resource Error: 12
         Hardware Overload Error: 8
```

FEATURE INTERACTIONS

None.

status isdn-testcall

This command displays the operational status (progress) of an outgoing ISDN-PRI test call.

SYNOPSIS

status isdn-testcall group number*/member number print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init

EXAMPLES

status isdn-testcall 80/1
status isdn-testcall 78/1 print

DESCRIPTION

The status isdn-testcall command displays the progress of an outgoing ISDN-PRI test call. The tested ISDN-PRI B-channel port number, bit error rate, number of bits transmitted, block error rate, number of blocks transmitted, start time, duration specified, duration of test call and reason of termination are displayed on the status form.

Defaults

None.

Parameters

group number	The group number is an administered number associated with each trunk group.
member number	The member number is an administered number identifying a particular trunk within a trunk group.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status isdn-testcall", the following is displayed:

```
Enter group #/member # ['print']
```

Error Messages

If the specified format of the trunk location is incorrect, the following message is displayed:

```
Format invalid
```

If the specified trunk group or member range is invalid, the following message is displayed:

```
Trunk or trunk group invalid
```

If a trunk group and member is not specified, the following message is displayed:

```
Must specify group/member pair
```

\If the specified trunk group is not administered or has no members administered, the following message is displayed:

```
Group not assigned,
or group assigned but with no member
```

If the specified trunk group member is not administered, the following message is displayed:

```
Group member not assigned
```

If a test call is currently not in progress when the command is entered, the following message is displayed:

```
Test Call not in progress
```

If the specified trunk is not an ISDN-PRI trunk, the following message is displayed:

```
Invalid non ISDN-PRI trunk specified
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	This field specifies the physical address (cabinet/carrier/slot/circuit) of the ISDN-PRI B-channel.
Bit Error Rate	The measured bit error count according to the comparison of the sent and received bit pattern. The number is displayed in scientific notation (one significant digit and an exponent).
Number of Bits	The number of bits generated. The number is displayed in scientific notation (one significant digit and an exponent).
Block error Rate	The measured block error count according to the comparison of the sent and received bit pattern. The number is displayed in scientific notation (one significant digit and an exponent).
Number of Blocks	The number of blocks generated. The number is displayed in scientific notation (one significant digit and an exponent).
Start Time	The time the test call started (dd/hh:mm).
Duration Specified	The duration specified in minutes for how long the test call should run. Valid durations are 1-120 (minutes) or blank (to indicate the default amount of 10 seconds was used to run the test).
Duration of Test	The duration specified in minutes for how long the test call has been running. A blank indicates that the default amount of time was used to run the test.

Reason of Termination

The reason of termination indicates why the test call has terminated. Valid reasons of termination are "finished," "canceled," "overflow," "no bits," "transmission," "internal fail," "data corrupt," "call dropped," "call rejected," and "in progress." A termination reason of "finished" means the test finished in the specified time. A termination reason of "canceled" means the test call has been canceled with the "clear isdn-testcall" command. A reason of "overflow" denotes that the bits transmitted have overflowed buffer allocation. A reason of "no bits" means that no bits have been received because the ISDN-PRI test call circuit connection is bad. A reason of "transmission" means there has been a data transmission interruption, probably caused from a power hit. A termination reason of "call dropped" indicates that the call dropped due to abnormal termination, or it couldn't cut-through to the other side. A termination reason of "call rejected" means the originating call was not set up properly. A termination reason of "internal fail" specifies that there is an internal error on the Maintenance/Test circuit pack. A reason of "in progress" means the test is still running and a reason of "data corrupt" is used for any other error condition.

For the following output example, the command status idsn-testcall 80/1 was entered.

```
status isdn-testcall 80/1                  Page 1 of   1   SPE A

                           ISDN TESTCALL STATUS

         Bit   Number Block Number           Duration          Reason
         Error Of     Error Of     Start     Duration  Of      Of
Port     Rate  Bits   Rate  Blocks Time      Specified Test    Termination

1B1401   0EE0  4EE7   0EE0  6EE2   25/12:36 120       100     in progress
```

FEATURE INTERACTIONS

If the bit error rate or block error rate is greater than zero, the ISDN-PRI trunk "may" be in a troubled state. Based on the statistical information displayed on the terminal, it can be decided to take the ISDN trunk out of service. This is subjective data because the ISDN trunk may be used for data or voice. If the trunk is used for data and the rates are high, the trunk should be taken out of service. If the trunk is used for voice, the trunk may not have to be taken out of service. Also, high rates may be due to some type of power hit on the line.

status journal-link

This command displays the status of a wakeup-log or a pms-log printer link.

SYNOPSIS

status journal-link [wakeup-log | pms-log] *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

status journal-link wakeup-log
status journal-link pms-log
status journal-link pms-log print

DESCRIPTION

The status journal-link command displays the status of a wakeup-log or a pms-log printer link. Either command will display whether the link is up or down. If the link is down, the number of times the switch has tried to set up the link will be shown.

A journal printer is used to document the automatic wake-up events, emergency access to attendant events, and housekeeping events when the property management system is not functional. A journal printer may also generate reports of the automatic wake-up events and the emergency access events at a scheduled time. If system configuration includes two printers, one will be for the housekeeping events only and the second will be used for automatic wake-up events and emergency access events only.

For general information on journal printer links, see the second paragraph in the "DESCRIPTION" section of the "busyout journal-printer" manual pages.

Defaults

No defaults.

Parameters

wakeup-log	The printer which handles the automatic wakeup and emergency access to attendant events and scheduled reports.
pms-log	The printer which handles the pms down events.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status journal-link", the following object command word choices will be displayed:

```
pms-log      wakeup-log
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Link State	Up, down, or extension not administered will be displayed. A wakeup-log or a pms-log link is considered administered only if an extension is given in the System Parameters Hospitality form.
Maintenance Busy	Whether there is any maintenance testing being performed upon the link.

The following is an example of the fields contained on the output form.

```
status journal-link wakeup-log

                      JOURNAL LINK STATUS

       Link State: up
 Maintenance Busy? no
```

FEATURE INTERACTIONS

None.

status link

This command displays the status of an Processor Interface (PI) link.

SYNOPSIS

status link link number *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, init, bcms, browse.

EXAMPLES

status link 1
status link 8
status link 4 print

DESCRIPTION

The status link command displays the operational status associated with a specified processor interface link.

Defaults

No defaults.

Parameters

link number	A link number (1-8) associated with a specific link.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status link", the following message will be displayed:

```
Enter 1 character link number ['print']
```

Error Messages

If the specified link number is invalid, the following message is displayed:

```
Link out of range, please press HELP
```

If the specified link number is not administered, the following message is displayed:

```
Link not administered
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

DEFINITIONS

Link	A synchronous connection between the Definity system and an adjunct or another switch. The link consists of three protocol levels. The entire link is identified by a link number which is specified on the "change communications-interface links" form.
Level 1	Physical connection of a port on a Processor Interface board to hardware which serves the same purpose on the adjunct or switch (for example, a PI board on G3iV1.1-286 or G3iV2-386, or an SCP board on Audix). There can be several components between these two endpoints (e.g., modems, DS1 facilities, cables, etc.).
Level 2	The logical protocol that allows data communication between these two endpoints. BX.25 specifies that this is the LAPB (Link Access Protocol on the B-channel) protocol. Frames are sent at level 2. Establishment of the protocol requires one end to send a SABM (Set Asynchronous Balanced Mode) frame and the other to respond with a UA (User Acknowledgment) frame. Both sides send SABMs until they receive a UA at which time level 2 is up and the Link Status field indicates "restarting". This should be a temporary condition, because the link is unusable until level 3 comes up, and that occurs immediately.

Level 3	The logical protocol that allows multiplexing of many channels onto one level 2 link. BX.25 specifies that this will be the X.25 data phase protocol. Packets are sent at level 3 and are included in level 2 frames. This protocol is established after level 2 is established by one end sending a Restart packet, and the other end sending a Restart Confirm packet.
Processor channel	The connection of an application running inside the SPE to a particular channel on a particular link. Processor channels are identified by a number associated with an entry on the "change communication-interface processor-channel" form. There the link number and level channel number on that link are specified as well as the application (for example, dcs) that uses that processor channel are specified.

OUTPUT

Link Number	The Processor Interface link number (1-8).
Link Status	The state of the link, valid states are: — in-service — PI link is currently up and providing service. — maintenance busy — The PI link has been busied out by system technician. — disconnected — The PI link is currently down. Check the Hardware Error Log for more information on why the link is not in-service.
Destination	A character string identifying the link destination type. The valid types are: "ISDN-LNK", "ISDN-TRK", "TIE-DS1", "PDMODULE", "TDMODULE", and " EIA LINK".
Dest Status	The status of the link destination. Valid states are: "in-service", "in-service/idle", "in-service/active", and "out-of-service", "manual OOS", "standby", "awaiting call", "disconnected", "out-of-service-NE", and "out-of-service-FE".
Port	The destination port, this port is logically connected to the Processor Interface.
Destination Information Field	One of the following will be present depending on the type of link destination. — Sig Grp — The signaling group number, valid for "ISDN-LNK". — Trk/Mem — The trunk group/member, valid for "ISDN-TRK" and "TIE-DS1". — Ext — The data module extension, valid for "PDMODULE" and "TDMODULE".

The following fields represent values of counters read from the Packet Interface board. These counters are not initialized on board insertion. It is therefore recommended that "clear link" command be issued and the counters are read after a period of time (15 min) to get a reliable readout.

Hardware Device Check (receive)	This timeout counter is incremented when there is a 40 to 80 second period during which no link traffic is received. This condition probably indicates that the link is down on the far end system. The SABM (Set Asynchronous Balance Mode) count is probably increasing also.
Hardware Device Check (transmit)	This timeout counter is incremented when there is a 40 to 80 second period during which no link traffic is transmitted. This condition indicates possible PI faults. The link is down and the SABM count is increasing. If the link is down at both the near end and the far end, then this counter will increment along with the Hardware Device Check (receive) counter.
Far-End MOOS Count	The number of times that the switch tries to restart the link and the Far-End responds with the link status "manual-out- of-service." This condition only occurs on ISDN-PRI Nonfacility Associated Signaling (NFAS) with D-channel backup. When this occurs, contact the Network and ask them to release the link.
Far-End FRMR	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link went down because the switch received an FRMR frame from the Far-End.
Far-End DISC	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link went down because the switch received a DISConnect frame from the Far-End.

Timeout	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link went down because of a Layer 2 timer expiration on the PI circuit pack.
Software Initiated Link Down	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the switch software restarted the link. Look at other PI-LINK errors to determine the cause.
Level 2 I-frames retransmitted	This is a count of the number of frames that have been retransmitted in LAPD (Link Access Procedure D) or X.25 layer 2. In general, this is a measure of link quality. This count, which could indicate a very noisy link or synchronization problem, will increment normally if a Hot Start PEI is done locally.
Level 2 Reset (SABM)	This is the number of X.25 SABMs or LAPD SABMs that have been transmitted. Since SABMs are used to establish links, every time this count is incremented a link establishment attempt has failed. If the link is currently in-service and the count is non-zero after having been previously cleared by the "clear link link-no" command, then this condition indicates that the link has gone down in that interval. Check the Hardware Error Log for additional information.
Invalid Frame Count	This is the number of invalid frames that have been received. This count is a measure of the link quality and could indicate a very noisy link or a synchronization problem. This might increment normally if a Hot Start PEI is done locally. If an administration error exists, this counter could be incrementing along with the Level 2 Reset counter. This counter may be incremented by message retransmissions.
Far-End SABM(E)/DM	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link went down because the switch received a SABM from the Far-End.

Protocol Error Detected	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link went down because the PI circuit pack detected a Layer 2 protocol error in its communications with the Far-End of the link.
Local Busy Out	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the link when down because the switch software made the link local busy. The link is made "maintenance busy" as part of the D-channel Back Up protocol or when the link is "busied out" via the System Access Terminal (SAT).
Firmware Initiated Link Down	This value is informational only and no action is necessary. It is one of eight counters that tell the history from the last "clear link" command of why the link went down. In this case, the PI firmware initiated the link down. Please consult SCI-BD or PROTOCOL errors to determine the cause.
LOCAL/REMOTE PROCESSOR CHANNELS	Local/remote processor channel pairs. Each pair consists of a processor channel on the local machine and a processor channel on the remote machine that are connected in the communication session. **NOTE:** For "ISDN-LNK" links, this is no correlation between the local and remote processor channels. Therefore, only the local processor channel is shown (the remote processor channel is blank).

The following are examples of the fields contained on the output form. The command entered, for each example, was "status link 1." Each example shown is for a different type of link connection.

```
status link 1


                              PI LINK STATUS

Link Number: 1              Destination: ISDN-LNK        Port: 1B1624
Link Status: in-service     Dest Status: standby      Sig Grp: 8


                              ERROR COUNTERS

 Hardware Device Check (receive): 0   Level 2 I-frames retransmitted: 0
Hardware Device Check (transmit): 0             Level 2 Reset (SABM): 3
              Far-End MOOS Count: 0             Invalid Frame Count: 0
                    Far-End FRMR: 0              Far-End SABM(E)/DM: 0
                    Far-End DISC: 0          Protocol Error Detected: 0
                         Timeout: 0                  Local Busy Out: 0
    Software Initiated Link Down: 0     Firmware Initiated Link Down: 0

                       LOCAL/REMOTE PROCESSOR CHANNELS

  1/
```

```
status link 1

                               PI LINK STATUS

Link Number: 1              Destination: ISDN-TRK            Port: 1B1623
Link Status: in-service     Dest Status: in-service/active Trk/Mem: 20/01


                               ERROR COUNTERS

 Hardware Device Check (receive): 0   Level 2 I-frames retransmitted: 0
Hardware Device Check (transmit): 0             Level 2 Reset (SABM): 3
              Far-End MOOS Count: 0             Invalid Frame Count: 0
                    Far-End FRMR: 0              Far-End SABM(E)/DM: 0
                    Far-End DISC: 0          Protocol Error Detected: 0
                         Timeout: 0                  Local Busy Out: 0
    Software Initiated Link Down: 0     Firmware Initiated Link Down: 0


                      LOCAL/REMOTE PROCESSOR CHANNELS

  1/1
```

```
status link 1

                              PI LINK STATUS

Link Number: 1             Destination: TIE-DS1            Port: 1B0123
Link Status: in-service     Dest Status: in-service/active Trk/Mem: 02/04


                              ERROR COUNTERS

 Hardware Device Check (receive): 0   Level 2 I-frames retransmitted: 0
Hardware Device Check (transmit): 0             Level 2 Reset (SABM): 3
              Far-End MOOS Count: 0              Invalid Frame Count: 0
                    Far-End FRMR: 0               Far-End SABM(E)/DM: 0
                    Far-End DISC: 0          Protocol Error Detected: 0
                         Timeout: 0                   Local Busy Out: 0
     oftware Initiated Link Down: 0     Firmware Initiated Link Down: 0


                      LOCAL/REMOTE PROCESSOR CHANNELS

  1/
```

```
status link 1

                              PI LINK STATUS

Link Number: 1             Destination: PDMODULE         Port: 1C0303
Link Status: in-service     Dest Status: in-service/active   Ext: 4002


                              ERROR COUNTERS

 Hardware Device Check (receive): 0   Level 2 I-frames retransmitted: 0
Hardware Device Check (transmit): 0             Level 2 Reset (SABM): 3
              Far-End MOOS Count: 0              Invalid Frame Count: 0
                    Far-End FRMR: 0               Far-End SABM(E)/DM: 0
                    Far-End DISC: 0          Protocol Error Detected: 0
                         Timeout: 0                   Local Busy Out: 0
    Software Initiated Link Down: 0     Firmware Initiated Link Down: 0


                     LOCAL/REMOTE PROCESSOR CHANNELS

  1/
```

```
status link 1

                            PI LINK STATUS

Link Number: 1              Destination: TDMODULE          Port: 1C0303
Link Status: in-service     Dest Status: in-service/active  Ext: 4002


                            ERROR COUNTERS

 Hardware Device Check (receive): 0   Level 2 I-frames retransmitted: 0
Hardware Device Check (transmit): 0             Level 2 Reset (SABM): 3
              Far-End MOOS Count: 0             Invalid Frame Count: 0
                    Far-End FRMR: 0              Far-End SABM(E)/DM: 0
                    Far-End DISC: 0          Protocol Error Detected: 0
                         Timeout: 0                  Local Busy Out: 0
     oftware Initiated Link Down: 0     Firmware Initiated Link Down: 0


                    LOCAL/REMOTE PROCESSOR CHANNELS

  1/
```

FEATURE INTERACTIONS

None.

status logins

This command will list the status all of the users that are currently logged into the system.

SYNOPSIS

status logins *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, rcust, bcms, browse, cust.

EXAMPLES

status logins
status logins print

DESCRIPTION

This command will display information about all of the users that are currently logged into the system. This information will contain their login names, location of physical access, and their currently executing command.

The screen does not automatically update, and is a reflection of the system at the time the request was made. Users may have logged off, or on, or the command may have finished executing while the information is being displayed. These updates will not be reflected until the next execution of the command.

Defaults

None.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the technician presses HELP after entering "status logins" the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The login information will be displayed with one line of data displayed for each user.

Login Id — This field shows the login id of the user that is currently logged into the system. The value of "LOGIN" means that the terminal is connected to that port and the login prompt is displayed, but no user is currently logged on. An asterisk in the login id field identifies your login.

Type — This identifies the type of connection that is associated with the login session. Following are the values for this field:

Login Type	Description
NET	This represents a dialed-in connection via a Netcon data channel.
EPN	This represents a connection to the SAT port of an EPN maintenance board. This is accomplished via a hard-wired connection to that port.
MGR1	This signals a physical connection to the local SAT port on the active processor carrier. This port is accessed via a hard-wired connection.
INADS	This represents a connection to the remote SAT port on the active processor carrier. This port is normally accessed via a dial-in connection.
SYS-PTR	This identifies that the system printer is active in the system. The login will be the id of the user who requested the print job, and the active command will be the command used for the print.

Location	This identifies the physical location where the user or printer is connected into the switch. For the types of MGR1 and INADS, this value will be the processor board location. For the EPN type, this will be the EPN maintenance board location. For the NET type this will be the physical location of the terminal port where the customer's SAT is connected. For a BRI NET connection the BRI endpoint is the last 3 digits, and for the SYS-PTR type this is the physical location of the printer port.
Aux	This field give additional location information. For the types of MGR1 and INADS, this field will contain the port network number of the processor board (that is, 1). For the EPN type, this field will contain the port network number of the EPN maintenance board. For the NET and SYS-PTR types, this field will contain the Netcon data channel number (1-4).
Active Command	This field displays the currently executing command, entered by the user logged into the system at the specified location. If the user has no command currently executing, then the field is empty.

The following is a sample output of a "status logins" command.

```
status logins

                     USER LOGIN INFORMATION

 Login               Type    Location   Aux   Active Command
*system technician  MGR1     01A        1     stat logins
 cust               NET      01c1101001 1     add station next
 inads              INADS    01A        1
 LOGIN              EPN      02A        3
 system technician  SYS-PTR  01c1102    2     list stations

Command Successfully Completed
```

FEATURE INTERACTIONS

The command will take a snapshot of the commands that the users on the system are currently executing. Because of timing, the command could be terminated by the time this command finishes displaying the list (i.e., the active command may not be accurate).

status mst

This command will allow the user to display the trigger and buffer status of the mst.

SYNOPSIS

status mst

PERMISSIONS

The following default logins may execute this command: inads, init.

EXAMPLES

status mst

DESCRIPTION

The status mst command will present the user with the form that contains the current status for the mst triggers and buffers.

Parameters

None.

Help Messages

If the user presses HELP after entering "status mst", the following message will be displayed:

```
Entry is not required
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

FORM OUTPUT

After entering the command "status mst", the user will be presented with the following form. The current settings will be placed in the fields.

```
                          MST STATUS

          Trace Status: enabled
    Start Trigger Status: triggered
     Stop Trigger Status: not triggered
      Pending Stop Count: 5
       Enable Trace Time: 1/21/90 10:30
     Disable Trace Time : 3/31/90 10:30

 Percent of Current Wrap: 100
        Wraparound Count: 2
    Oldest Message Number: 3345
    Newest Message Number: 3923
      Completed Snapshots: 0
```

trace status	Can be "enabled", "disabled by command", "disabled by timer", "disabled by buffer full", "disabled by stop trigger or count" or "disabled by restart".
trigger status	Can be "none", "not triggered", "triggered".
Pending stop count	This field will have a value in it whenever it is actually being used. The value will indicate the number of messages to be collected before stopping the trace.
Enable trace time	The time the trace was enabled.
Disable trace time	The time the trace was disabled or will be disabled by the run time limit.
Percent of current wrap	The percentage of the buffer that has been written since the last wraparound.
Wraparound count	The number of times that the buffer has wrapped around. This will initially be 0.

Oldest message number	The sequence number of the oldest message in the trace.
Newest message number	The sequence number of the newest message in the trace.
Completed snapshots	The number of complete snapshots that have been collected.

FEATURE INTERACTIONS

None.

status packet-control

This command displays the status of the specified packet-control.

SYNOPSIS

status packet-control *location*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms

EXAMPLES

status packet-control 1A
status packet-control 1B

DESCRIPTION

The status packet-control command will display the service state of the specified packet-control, and link statistics for links that are terminated on this packet-control. The service state can be either in-service or out-of-service. The link statistics describe the connectivity picture for links terminated by this packet-control. The total number of links is the number of links that have been administered or translated. The number of established links is the number of links that have transitioned from a translated (tie-assigned) state to a state of normal operation (Multi-Frame Established Normal state). Proper handshaking is required for links to be in the established state.

Defaults

For simplex systems, the location is optional and defaults to cabinet 1, carrier A. For duplex systems, the cabinet default is again cabinet 1, but there is no default for the carrier.

Parameters

location	The location only applies to duplicated configurations. If the configuration is a simplex, the location parameter is not used and thus is not valid. For duplicated configurations, a "location" represents the carrier that the packet-control resides on in the system. Valid locations are either 1A or 1B.

Help Messages

If the system technician presses HELP after entering "status packet-control", the following message is displayed:

```
Enter Packet Control location:
[cabinet(1)];carrier(A-B)
```

Error Messages

If this command is entered for a packet-control that resides on the stand-by control complex of a High or Critical Reliability System, the following message is displayed:

```
Command only applies to the active Packet Control
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Service State: This field describes the service state of the packet-control. Valid service states are "in-service" and "out-of-service". In-service means that the packet-control is providing service. Out-of-service means that the packet-control is not providing service. Typical reasons for the out-of-service state are:

- The packet-control is busied out.
- The packet-control has failed.

Total No. of links: The total number of links that require establishment for normal operation. Point-to-point signaling links are an example of links that require establishment. There is usually one point-to-point signaling link per endpoint with packet-bus connectivity (for example, ISDN-BRI endpoints).

No. of links that are established: The number of links that are established out of the total number of links. Ideally, all point-to-point signaling links are in the established state and thus, the number of established links will be equal to the total number of links.

For the following output example, the command status packet-control 1A was entered.

```
status packet-control 1A

                     PACKET CONTROL STATUS

                     Service State: in-service
                Total No. of links: 10
No. of links that are established: 10


Command successfully completed
```

STATUS INTERPRETATION SECTION

The "Total No. of Links" minus the "No. of link that are established" equals the number of links which are down. Links that are down do not necessarily imply that there is a Packet Control circuit pack failure. A link goes down if there is a failure on any of the components through which it passes. These components include the Packet Control circuit pack, the Packet Bus, the Expansion Interface circuit pack, the BRI circuit pack, and the endpoint itself. By knowing which components can cause a link terminating on the Packet Control circuit pack to go down, and by having a rough idea of how many links go through each component, it is possible to determine which components are the most likely candidates to have failed.

For example, when all of the links are down (that is, no links are established) it is likely that there is a failure with a component through which all of the links pass. All links always pass through the Packet Control circuit pack and the PPN Packet Bus. Thus, these two components are likely to have failed. If all of the packet endpoints are in one EPN, then that EPN's Packet Bus is also a likely to have failed. It is unlikely that the failure is with an individual BRI circuit pack, since that would only affect links passing through that one circuit pack (unless there is only one BRI circuit pack in the system, in which case that circuit pack may very possibly have failed).

Conversely, if only a few links are down, then it is not likely that the fault is with the Packet Control circuit pack or the PPN Packet Bus, since a fault on either of these would normally affect all links equally. In this case, the fault is more likely to be on an individual BRI circuit pack or endpoint.

CAUTION:

The purpose of the information described above is to provide general information about the causes of link failures. This information should be used in conjunction with the procedures found throughout this manual, and not as a replacement for those procedures.

FEATURE INTERACTIONS

In a High or Critical Reliability System, an attempt to get the status of the packet-control that resides in the standby processor complex will not be allowed.

status periodic-scheduled

This command displays the status of periodic and scheduled maintenance testing performed by the system.

SYNOPSIS

status periodic-scheduled *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

status periodic-scheduled
status periodic-scheduled print

DESCRIPTION

The status periodic-scheduled command displays summary information on active scheduled and periodic testing. Periodic tests are run every hour, while scheduled tests are run every 24 hours. Scheduled tests can have their starting and stopping times administered. For periodic maintenance, the completion percentage for all resources will be displayed for the current cycle of testing as well as the previous cycle of testing. For scheduled maintenance, the completion percentage of all resources will be displayed for the last 24 hour testing cycle.

Defaults

No defaults.

Parameters

print   This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status period-scheduled", the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit.
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later.
```

OUTPUT

Pre - SCHEDULED MAINTENANCE	During scheduled maintenance, a delay of about 1 to 15 minutes can be observed prior to the testing of System Critical Resources. During this period maintenance is switching those duplicated resources administered on the **system-parameters maintenance** screen. Pre-scheduled maintenance also includes the time the standby SPE is being tested in a system with the duplication option.
System Critical Percentage Complete:	The ratio of the number of System Critical MOs tested to the number of System Critical MOs left to test. This number is displayed for the current testing period as well as the previous testing period. System critical resources are considered imperative to test, and are tested first (for example, Processor).
Shared Percentage Complete:	The ratio of the number of Shared MOs tested to the number of Shared MOs left to test. This number is displayed for the current testing period as well as the previous testing period. Shared resources are resources that are used by more than one user, and are tested after system critical resources (for example, Trunks).
Single User Percentage Complete:	The ratio of the number of Single User MOs tested to the number of Single User MOs left to test. This number is displayed for the current testing period as well as the previous testing period. Single User resources are resources that are used by a single user only, and are tested after shared resources (for example, Voice Stations).

Start Time of Current or Previous Cycle:	For both periodic and scheduled maintenance if any of the three levels of MOs are active, then the time the System Critical MOs started for this current cycle is shown. If, however, none of the MO levels are currently being tested, then the start time for previous completed cycle is shown.

For the following output example, the command "status periodic-scheduled" was entered.

```
status periodic-scheduled                                  SPE B

               MO            Current  Current  Previous Cycle  Rate of
              Type           Cycle %   Cycle     Duration     Completed
                             Complete  Active?  (hr:min:sec)   Cycles
PERIODIC      System Critical  100%      n        00:00:45     1.0/hr
MAINTENANCE   Shared Resource  100%      n        00:00:43     1.0/hr
                  Single User    0%      n        00:00:01     1.0/hr
                        Total                     00:01:29


   Start Time of Current or Previous Cycle: 11/19/13:34:56


  Pre - SCHEDULED MAINTENANCE            n        00:00:01

SCHEDULED     System Critical   16%      y        00:00:44     1.0/day
MAINTENANCE   Shared Resource  100%      n        00:03:16     1.0/day
                  Single User  100%      n        00:00:00     1.0/day
                        Total                     00:04:00

   Start Time of Current or Previous Cycle: 11/19/13:42:08
```

FEATURE INTERACTIONS

None.

status pms-link

This command displays the status of the property management system interface link.

SYNOPSIS

status pms-link *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse.

EXAMPLES

status pms-link
status pms-link print

DESCRIPTION

The status pms-link command displays the status of the property management system interface link. If the link is up, whether or not a data base swap is taking place between the switch and PMS, will be shown. If the link is down, the number of times the switch has tried to set up the link will be shown.

A property management system (PMS) is a stand alone computer system which can be integrated with the switch to enhance the service capability for a hotel/motel.

For general information on PMS links, see the second paragraph in the "DESCRIPTION" section of the "busyout pms-link" manual pages.

Defaults

No defaults.

Parameters

print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status pms-link", the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Physical Link State	Up, down, or extension not administered will be displayed. The PMS link is considered administered only if an extension is given in the System Hospitality form.
Protocol State	"up", "down", or blank if not administered.
Number of Retries	Number of times the switch has tried to set up the link. Only displayed when the link is down. The Largest number that can be displayed is 999.
Maintenance Busy	"yes", or "no" (that is, system technician has or has not busied out the link). Blank if PMS link not administered.

The following is an example of the fields contained on the output form.

```
status pms-link

                      PMS LINK STATUS

    Physical Link State: down
         Protocol State: down
      Number of Retries: 3
       Maintenance Busy? no
```

FEATURE INTERACTIONS

None.

status pri-endpoint

This command displays the status of a PRI endpoint.

SYNOPSIS

status pri-endpoint extension *print*

PERMISSIONS

The following default logins may execute this command: system technician, cust, inads, init, nms, browse.

EXAMPLES

status pri-endpoint 25012
status pri-endpoint 77868
status pri-endpoint 66078 print

DESCRIPTION

The status pri-endpoint command displays internal software state information for diagnosis. This command can help locate facilities with which a PRI endpoint is communicating. Status information for each of the B-channels making up the PRI endpoint are displayed in addition to some overall PRI endpoint information.

Defaults

No defaults.

Parameters

extension	The extension number of the PRI endpoint to be displayed. The number of digits in an extension is determined by the dial-plan.
print	This will cause the report to be printed if a printer is connected to the SAT.

Help Messages

If the user presses HELP after entering "status pri-endpoint", the following message is displayed:

```
Enter assigned extension, ['print']
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a PRI endpoint, the following message will be displayed:

```
Extension assigned to object other than pri-endpoint
```

If the board that contains the PRI endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the EPN on which the PRI endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Extension	The extension of the PRI endpoint.
Width	Administered number of B-channels associated with the specified PRI endpoint.
Signaling Group ID	The ID number of the signaling group which handles the signaling for the ports in the specified PRI endpoint.
Originating Auto Restoration	Administered option for the auto restore feature which restores calls originated from this PRI endpoint in the case of network failure. Displayed values for this field are "y" for the restoration option enabled and "n" for the restoration option disabled.

B-Channels Active	The number of B-channels active on a call.
B-Channels Idle	The number of B-channels that are in the in-service/idle state.
Port	Port locations (cabinet-carrier-slot-circuit) for each of the B-channels that makes up the PRI endpoint.
Service State	This field shows whether each of the B-channels is in-service or out-of-service. One of the following states is displayed: in-service/active, in-service/idle, out-of-service-NE, out-of-service-FE, maint-NE/active, maint-FE/active, maint-NE/idle, and maint-FE/idle. NE (Near End) and FE (Far End) refer to which "end" of the B-channel has placed the facility in the state that it is in. NE refers to the switch and FE refers to the PRI terminal adapter (or any device that terminates the D-channel signaling on the facility).
Test In Progress	Whether there is any maintenance testing being performed on the port.
Connected Port	This field lists the connected port location (cabinet-carrier-slot-circuit) for each of the B-channels active on a call.

For the following output example, the command "status pri-endpoint 22501" was entered. Assume that the PRI endpoint ports for extension 22501 are in cabinet 1, carrier B, slot 20, circuit 1 to 6. The ports 1 to 3 of the specified PRI endpoint are connected on an active call to ports 13 to 15 of board in location 1B19 (cabinet 1, carrier B, slot 19). Ports 4 and 5 of the specified PRI endpoint are idle. Port 6 of the specified PRI endpoint is out of service and background maintenance testing is being performed on the port.

Note that a PRI endpoint can initiate and receive a call on any one or more of the B-channels making up the PRI endpoint.

```
status pri-endpoint 22501                              page 1 of 1


                       PRI-ENDPOINT STATUS

                    Extension: 22501              Width: 6
           Signaling Group ID: 3       B-Channels Active: 3
 Originating Auto Restoration? n         B-Channels Idle: 2


  Port     Service State       Test In Progress  Connected Port
  01B2001  in-service/active          n          01B1913
  01B2002  in-service/active          n          01B1914
  01B2003  in-service/active          n          01B1915
  01B2004  in-service/idle            n
  01B2005  in-service/idle            n
  01B2006  out-of-service-NE          y


Command Successfully Completed
```

Note that the line listing of each B-channel's status may continue on to the next page. The user is prompted to hit <NxtPg> key to continue the display.

FEATURE INTERACTIONS

None.

status processor-channel

status processor-channel - This command displays the status of a processor channel.

SYNOPSIS

status processor-channel channel number *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse, bcms, rcust.

EXAMPLES

status processor-channel 1
status processor-channel 10
status processor-channel 64
status processor-channel 64 print

DESCRIPTION

The status processor-channel command displays the status of the technician specified processor channel and the values of its various counters. A processor channel is one 64 logical channels associated with an SCI link. Each processor channel terminates in the switch processing element with a session.

Defaults

No defaults.

Parameters

channel number	The processor channel number (1-64).
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status processor-channel", the following message will be displayed:

```
Enter a processor-channel number 1-64 ['print']
```

Error Messages

If the technician-entered channel number is invalid, the following message will be displayed:

```
Channel invalid
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Channel Number	The processor channel number 1-64.
Channel Status	The state that the channel is in: 1-10 (Channel status 9 and 10 pertain to ISDN-PRI channels). The following describes the various channel states: 1. Channel is not administered. 2. Channel is administered but not used. 3. Channel is in a state entering "wait session accept" (WSA). 4. Channel is in a state waiting for a "session accept" message from the far end. 5. Channel is waiting for action. 6. Channel is in data transfer state (channel is up and running). 7. Channel is in resynchronization state. 8. Channel is waiting for acknowledge of disconnect message. 9. ISDN-PRI Channel is currently down. 10. ISDN-PRI Channel is in the data transfer state (that is, channel is up and running).
Reset Count	The number of times that the reset has been issued for this channel.

Message Buffer Number	The number of message buffers that are currently used for the communication on this channel.
Link Number	The physical SCI link (i.e. 1-8) associated with the channel.
Retransmission Count	The number of times that message retransmission has occurred.

The following is an example of the fields contained on the output form.

```
status processor-channels 1


                     PROCESSOR CHANNEL STATUS

        Channel Number: 1
        Channel Status: 6: In data transfer state
           Reset Count: 3
 Message Buffer Number: 1
           Link Number: 4
  Retransmission Count: 5
```

FEATURE INTERACTIONS

None.

status signaling-group

status signaling-group - This command displays the operational status of the specified ISDN-PRI signaling group.

SYNOPSIS

status signaling-group group identifier *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse.

EXAMPLES

status signaling-group 1
status signaling-group 2 print

DESCRIPTION

The status signaling-group command displays the state, type, port location, and state of the Primary and Secondary D-channels within the group.

A signaling group is a collection of B-channels signaled for by a designated single D-channel or set of D-channels over an ISDN-PRI.

Defaults

None.

Parameters

group identifier	The signaling group identifier is an administered number associated with each signaling group (1-8).
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status signaling-group", the following is displayed:

```
Enter group identifier (1-8) ['print']
```

Error Messages

If the specified group identifier is non numeric or out of range, the following message is displayed:

```
Signaling group invalid
```

If the specified group identifier is not administered, the following message is displayed:

```
No signaling group assigned
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Group ID: The numerical ID of the signaling group. Valid identifiers are 1-8.

Type: The signaling group can be either "facility associated signaling" or "non-facility associated signaling." In the "facility associated signaling" type all members are on a single DS-1 facility. Facility associated signaling groups support only the simplex D-channel configuration. In the "non-facility associated signaling" type members can be carried by multiple DS-1 facilities. The DS-1 facility is identified across the ISDN-PRI using an explicit facility identifier. In a simplex configuration one D-channel is used to signal for B-channel members, while in a duplex configuration two D-channels are used to signal for B-channel members (one channel is active and the other is used as a backup to the active channel).

Group State:	The signaling group state can be either "in-service" or "out-of-service." The group is "in-service" when one of the D-channels signaling for the group is in service. The group is "out-of-service" when neither D-channel in the group is in service. NOTE: If there is no D-channel backup and the primary D-channel is out-of-service, then the signaling group is in an "out-of-service" state.
Link:	The link transporting the D-channel.
Port:	The physical address of the port transporting either the primary or secondary D-channel.
Level 3 State:	The state of the primary or secondary D-channels. The state can be "in-service," "standby," "wait," "maintenance busy," "manual-out-of-service," "out-of-service," or "no-link."

in-service:A D-channel is "in-service" when it is in the multiple-frame-established state at layer 2 carrying normal call-control signaling at layer 3.

standby:A D-channel is "standby" when it is in the multiple-frame-established state at layer 2, and not carrying any layer 3 call-control messages on logical link 0,0.

wait:A D-channel is in a "wait" state when an attempt has been made by one side of the interface to establish layer 3 peer communications as part of the process of going to the "in-service" state. This state is transitional in nature. As ISDN SERVICE message is sent over the interface, When the far end of the interface responds with a SERVICE ACKnowledge message the D-channel is placed in the "in-service" state.

maintenance-busy:A D-channel is "maintenance-busy" when it is not in the multiple-frame-established state at layer 2. This state is entered automatically when an active D-channel is declared failed. A D-channel which has been placed in the "maintenance-busy" state may be place in the "out-of-service" state without system technician intervention.

manual-out-of-service:A D-channel is "manual-out-of-service" when system technician intervention has caused it to be placed in the TEI-assigned state at layer 2. System Technician intervention is required to retrieve a D-channel from this state.

out-of-service:A D-channel is "out-of-service" when it is in the TEI-assigned state at layer 2, but is periodically requested by layer 3 to attempt to establish the link.

no-link:No link is administered for the D-channel.

For the following output example, the command status signaling-group 1 was entered.

```
status signaling-group 1                  Page 1 of   1   SPE A


                     STATUS SIGNALING-GROUP

      Group ID: 1
          Type: facility associated signaling
   Group State: in-service


                     Primary D-Channel

 Link: 1    Port: 01C1924  Level 3 State: in-service


                    Secondary D-Channel

 Link:    Port:      Level 3 State:
```

FEATURE INTERACTIONS

None.

status sp-link

This command displays the operational attributes of the system printer link.

SYNOPSIS

status sp-link *print*

PERMISSIONS

The following default logins may execute this command: system technician, cust, rcust, bcms, inads, init, browse.

EXAMPLES

status sp-link
status sp-link print

DESCRIPTION

The status sp-link command displays a page of output summarizing the operational status of the system printer link. The link state, number of retries, and whether the link is maintenance busy is displayed.

Defaults

None.

Parameters

print   This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status sp-link", the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Link State:	This field displays the operational mode of the link. A state of "up,""down," or "extension not administered" is displayed. A state of "up" means that the link is administered and a call is setup between the switch and the system printer. A state of "down" means that the link is administered, but a call is not setup between the switch and the system printer. A state of "extension not administered" means that the link is not administered (no system printer extension has been administered).
Number of Retries:	This field is displayed only if the "Link State:" is "down." The field displays the number of times the switch has tried to set up the link since a request to set up the link has been received. The largest number that can be displayed is "999". If more than "999" retries have occurred, "999" is still displayed.
Maintenance Busy?	This field displays whether any maintenance testing is being performed on the system printer link. Values of "yes" and "no" are displayed if the system printer link is administered (the system printer extension is administered). Blanks are displayed if the system printer link is not administered.

For the following output example, the command status sp-link was entered.

```
status sp-link                                SPE A


                     SYSTEM PRINTER LINK STATUS

        Link State: up
 Number of Retries:
  Maintenance Busy? no
```

FEATURE INTERACTIONS

None.

status station

status station - This command displays the status of a station.

SYNOPSIS

status station extension *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse.

EXAMPLES

status station 10020
status station 83277
status station 83277 print

DESCRIPTION

The status station command displays internal software state information for diagnosis. This command can help locate facilities to which the station is communicating.

Defaults

No defaults.

Parameters

extension	The extension of the station to be displayed. The number of digits in an extension is determined by a dial-plan.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status station", the following message will be displayed:

```
Enter assigned extension, [’print’]
```

Error Messages

If the extension format is incorrect, the following message will be displayed:

```
Extension invalid
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the extension is not a station or an attendant console, the following message will be displayed:

```
Extension exists but assigned to a different object
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Type	The administered station type.
Extension	The extension of the station or attendant to be displayed.
Port	The port location of the station (cabinet-carrier-slot-circuit).
Call Park	Whether the station has a call parked ("yes" or "no").
Ring Cut Off Activated	Whether ring cut off is activated ("yes" or "no").
CF Destination Ext	The call forwarding destination extension, if any.
Message Waiting	Whether there is a message waiting for the station. "AP-SPE", "AUDIX", "PMS" or blank if no messages are waiting.
Connected Ports	Port locations of the facilities to which the station is connected (cabinet-carrier-slot-circuit).
Agent Logged In	Displays (underneath it) the hunt groups (up to 3) that the agent is logged into.

On ACD Call?	Whether the agent is on an ACD call currently ("yes" or "no").
Work Mode	Work mode of each hunt group that an agent is logged into.
Service State	In service/on-hook, in service/off-hook, out of service, or disconnected.
Maintenance Busy State	Whether maintenance is testing the object ("yes" or "no").
SAC Activated	Whether send all calls is activated ("yes" or "no").
User Cntrl Restr	One or two of the following: "none", "total", "stat-stat", "outward" or "terminate".
Group Cntrl Restr	One or two of the following: "none", "total", "stat-stat", "outward" or "terminate".
AWU Call at	What time an automatic wakeup call is scheduled.
User DND	Status of the do not disturb feature.
Group DND	Status of the group do not disturb feature.
Room Status	Whether a room is occupied or not ("non-guest room", "vacant" or "occupied").

For the following output example, the command that was entered is "status station 1002".

```
status station 1002


                       GENERAL STATUS

             Type: 7405D          Service State: in-service/on-hook
        Extension: 1002        Maintenance Busy? no
             Port: 01C0702        SAC Activated? no
      Call Parked? no          User Cntrl Restr: none
  Ring Cut Off Act? no        Group Cntrl Restr: none
CF Destination Ext:
   Message Waiting:
   Connected Ports:


      ACD STATUS            HOSPITALITY STATUS

  Agent Logged In   Work Mode          AWU Call At:
                                          User DND: not activated
                                         Group DND: not activated
                                       Room Status: non-guest room
     On ACD Call? no
```

FEATURE INTERACTIONS

None.

status synchronization

This command displays the current status of synchronization.

SYNOPSIS

status synchronization *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, browse.

EXAMPLES

status synchronization
status synchronization print

DESCRIPTION

The status synchronization command displays the location of the DS1 or tone-clock circuit pack that is used for an on-line synchronization reference.

The synchronization subsystem provides error free digital communication between the switch and other PBXs, COs, or customer premise equipment. The subsystem is made up of system components involved in synchronization: TDM bus clock, DS1 trunk board, maintenance and administration software resident in the SPE.

Defaults

No defaults.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status synchronization", the following message will be displayed:

```
['print']
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Stratum Level	This is the synchronization stratum level, either a "3" or "4."
Maintenance Name:	Either "TONE-BD," "DS1-BD," or "STRAT-3."
Physical Location	The board location of the selected DS1 or tone-clock circuit pack. This includes the cabinet-carrier-slot for a DS1 or the cabinet-carrier for a tone-clock.
Switching Capability	Whether the on-line reference for synchronization can be switched. "Enabled" and "Disabled" are used to describe the current capacity for reference switching.
Excessive Reference Switching	This field gives a high level description of how many times the synchronization reference has been switched. If excessive reference switching is taking place (sync error 1793 is at threshold) this field displays "Yes," otherwise "No" is displayed.

For the following output example, the command that was entered is "status synchronization".

```
status synchronization


                         SYNCHRONIZATION STATUS

                Stratum Level:4
             Maintenance Name: TONE-BD   Physical Location: 01A
         Switching Capability: Enabled
Excessive Reference Switching: No
```

FEATURE INTERACTIONS

None.

status system

This command displays the status, mode, and operational attributes of the SPE(s), TDM and Packet busses, tone-clock circuit pack(s), expansion interface links (exp-links), and emergency transfer switch of a single cabinets or all cabinets in the system. For more information about SPE(s) see Chapter 8, "SPE Duplication".

SYNOPSIS

status system cabinet

PERMISSIONS

The following logins may execute this command: bcms, browse, system technician, cust, inads, init, rcust.

EXAMPLES

status system 1st-cabinet
status system 2nd-cabinet
status system 3rd-cabinet
status system all-cabinets

DESCRIPTION

status system - This command displays the status, mode, and operational attributes of the SPE(s), TDM and Packet busses, tone-clock circuit pack(s), expansion interface links (exp-links), and emergency transfer switch of a single cabinets or all cabinets in the system.

Defaults

No defaults.

Parameters

cabinet — The cabinet specifies for which cabinet to display status. "**1st-cabinet**" always refers to the PPN, "**2nd-cabinet**" refers to the 1st EPN, and "**3rd-cabinet**" refers to the 2nd EPN. The status for one cabinet is displayed on one page of output. If "**all-cabinets**" are specified, then the user gets a 3 page output, one for each cabinet in the system. The status displayed for a cabinet is always related to that cabinet except in the case of status for EPNs and the SPE attributes. SPE attributes always refer to PPN status regardless of which cabinet is being displayed.

Help Messages

If the system technician presses HELP after entering "status system", the following message will be displayed:

```
Please enter one of the following object command words:
                    1st-cabinet
                    2nd-cabinet
                    3rd-cabinet
                   all-cabinets
```

If the system technician presses HELP after entering "status system cabinet", where "cabinet" is one of the object described above, the following message will be displayed:

```
['print']
```

Error Messages

None

OUTPUT

CAUTION:
The purpose of this command is to provide general information about the cabinet status. This information may not display correctly when the cabinet is in a transient period. In this case, wait for 1 minute and enter the command again.

SPE — The identifier of the Switch Process Element (SPE). Valid identifiers are **1A** or **1B**.

MODE — The modes of an SPE are different for simplex systems versus those for systems with the duplication option.

1. **SIMPLEX SPE MODES**
   - **active** The **1A**SPE in a simplex system is always the **active** SPE.
   - **<blank>** The **1B**SPE in a simplex system always displays **<blank>** indicating there is no 1B SPE.
2. **DUPLEX SPE MODES**

   The modes for the active and standby SPE in a system with the duplication option are different.
3. **DUPLEX ACTIVE SPE MODES**
   - **active** This SPE is performing its designed functions for the system as the active SPE.
   - **active/override-on** This SPE is performing its designed functions for the system as the active SPE, however, this SPE is active because it was forced active via a **reset system interchange health-override** command.
   - **selected** This SPE is the "active" SPE and is performing its designed functions for the system, however, the SPE select switches will **not** allow this SPE to become the standby SPE.
4. **DUPLEX STANDBY SPE MODES**

   The modes of the standby SPE can be classified into one of the following four areas: **Standby Mode**, **Busyout Modes**, **Maintenance Modes** and **Down Modes**.
5. **STANDBY MODE**
   - **standby** This SPE is held reset, its memory is being shadowed from the active SPE, and is ready to take over the functions being performed by the active SPE.
6. **BUSYOUT MODES**

   Busyout modes occur when the standby SPE has been busied out via the **busyout spe-standby** command. The active SPE could be either **active** or **selected** when the standby SPE is in one of the **Busyout** modes.
   - **busyout/idle** This standby SPE has been busied out and no maintenance activity is currently taking place. The active SPE could be either **active** or **selected**.
   - **busyout/entering** This standby SPE has been busied out and is currently in the process restarting the switch software on this SPE. As soon as the switch software on this SPE finishes its initialization, the standby SPE will be ready to perform SAT requested maintenance functions on the standby SPE and the mode will change.
   - **busyout/testing** This standby SPE has been busied out, however the switch software on this SPE has been restarted and is currently in the process of executing a SAT demanded **test** command.

- **busyout/not-refreshed** This standby SPE has been busied out, however the **busyout spe-standby** command was executed at a time when the standby memory was not refreshed. The standby SPE will not be able to perform any maintenance or SAT requested activities until a successful **refresh spe-standby** command is executed.
- **busyout/list-config** This standby SPE has been busied out, however the switch software on this SPE has been restarted and is currently in the process of executing a SAT demanded **list configuration** command.
- **busyout/status** This standby SPE has been busied out, however the switch software on this SPE has been restarted and is currently in the process of executing a SAT demanded **status card-mem** command.

7. **MAINTENANCE MODES**

Maintenance modes occur when the standby SPE is taken out of **standby** mode to perform a maintenance or SAT requested function. Unlike the **busyout** and **down** modes, being in **maintenance** mode implies this SPE can be returned to **standby** mode when the requested activity is completed assuming there are no faults in the standby SPE complex. The active SPE could be either **active** or **selected** when the standby SPE is in one of the **Maintenance** modes.

- **maint/init** The standby SPE is in maintenance mode because the system has restarted within the last 10 minutes. During this 10 minute interval, the standby SPE is not placed into standby mode just in case a core dump is being written to the tape or memory card on the standby SPE.
- **maint/idle** This standby SPE is in maintenance mode, however no maintenance activity is currently taking place. The active SPE could be either **active** or **selected**.
- **maint/entering** This standby SPE is currently in the process of restarting the switch software on this SPE. As soon as the switch software on this SPE finishes its initialization, the standby SPE will be ready to perform SAT requested maintenance function and the mode will change.
- **maint/testing** This standby SPE is in maintenance mode executing a SAT demanded **test** command.
- **maint/not-refreshed** This standby SPE is in maintenance mode executing a destructive background maintenance test that has temporarily left the standby memory not refreshed. Once the current test has completed a refresh of the standby SPE will be performed by background maintenance and the mode will change.
- **maint/not-tested** This standby SPE is in maintenance mode because previously the active SPE had been selected with the SPE select switches and since the active was unselected the standby

has not been tested to ensure the standby can enter standby mode. Once the standby is tested successfully, the standby will go back to standby mode.

- **maint/list-config** This standby SPE is in maintenance mode and is currently in the process of executing a SAT demanded **list configuration** command.
- **maint/save~trans** This standby SPE is in maintenance mode and is currently in the process of executing a SAT demanded **save translation** command.
- **maint/save~announce** This standby SPE is in maintenance mode and is currently in the process of executing a SAT demanded **save announcement** command.
- **maint/status** This standby SPE is in maintenance mode and is currently in the process of executing a SAT demanded **status card-mem** command.
- **maint/patching** This standby SPE is in maintenance mode and is currently in the process of applying a software patch to the standby SPE memory (386 systems) or writing the patch to tape (286 systems).
- **maint/periodic** This standby SPE is in maintenance mode and is currently in the process of performing periodic background maintenance. Periodic background maintenance is performed on the standby SPE every two hours if some component of the standby SPE is currently alarmed.
- **maint/scheduled** This standby SPE is in maintenance mode and is currently in the process of performing daily scheduled background maintenance.
- **maint/analysis** This standby SPE is in maintenance mode and is currently in the process of performing background maintenance testing in response to a reported trouble by some component in the active or standby SPE complex that relates to the standby SPE.
- **maint/upgrade** This standby SPE is in maintenance mode and is currently in the process of performing software upgrade.

8. **DOWN MODES**

The standby SPE is placed in **down** mode when a fault occurs in the standby SPE complex that would prevent that SPE from performing system functions. **Down** mode is always associated with **STBY-SPE** alarms and errors. The active SPE could be either **active** or **selected** when the standby SPE is in one of the **Down** modes.

- **down/bad_upgrade** This standby SPE is in down mode because a software upgrade attempt failed. The standby SPE will stay in down mode until a successful software upgrade is performed.

- **down/idle** This standby SPE is in down mode, however, no maintenance activity is currently taking place. The active SPE could be either **active** or **selected**.
- **down/entering** This standby SPE is in down mode, but is currently in the process of trying to restart the switch software on this SPE. As soon as the switch software on this SPE finishes its initialization, the standby SPE will be ready to perform background or SAT requested maintenance activity.
- **down/mismatch_soft** This standby SPE is in down mode because the vintage of software in flash memory of the standby SPE does not match the vintage of the software in the active SPE. The standby SPE will stay in down mode until a successful software upgrade is performed to fix the software mismatch.
- **down/testing** This standby SPE is in down mode attempting to execute a SAT demanded **test** command.
- **down/not-refreshed** This standby SPE is in down mode executing a destructive background maintenance test that has temporarily left the standby memory not refreshed. Once the current test has completed a refresh of the standby SPE will be attempted by background maintenance and the mode will change.
- **down/analysis** This standby SPE is in down mode and is currently in the process of performing background maintenance testing in an effort to determine if the problem has been corrected.

SELECT SWITCH The position of the SPE select switch on the Duplication Interface circuit pack is displayed in the SPE related information section. The switch can be in one of three positions:

— **auto**

The switch is in the position.

— **spe-a**

The switch is in the left position.

— **spe-b**

The switch is in the right position.

— **<blank>**

Always appears for the 1A and 1B SPE in a simplex system. In a system with High or Critical Reliability, a **"blank"** implies a hardware problem with the Duplication Interface circuit pack.

PE ALARMS - MAJOR

The number of Major alarms associated with the SPE complex that affect the fault severity level of this SPE is shown. If the system is simplex system, then the 1B SPE always shows blank.

SPE ALARMS - MINOR

The number of Minor alarms associated with the SPE complex that affect the fault severity level of this SPE is shown. If the system is simplex system, then the 1B SPE always shows blank.

TONE/CLOCK

The location of the tone-clock circuit pack. Valid locations are **1A**, **1B**, **2A**, **2B**, **3A** and **3B**.

SERVICE STATE

The operational state of the Tone-Clock circuit pack. The possible states are as follows:

— **in**

The Tone-Clock is installed in the system and is in-service.

— **out**

The Tone-Clock has failed certain maintenance tests and has been removed from service.

— **<blank>**

If the system is not duplicated, then there is no B carrier Tone-Clock and this field displays **"blank"**.

SYSTEM CLOCK — This field shows which Tone-Clock circuit pack supplies the system clock for the cabinet being displayed.

— **active**

This Tone-Clock is active and is supplying the system clock for this cabinet.

— **standby**

This Tone-Clock is standby and is ready to supply the system clock for this cabinet if the active clock fails.

— **down**

This Tone-Clock has failed some maintenance activity and can not supply the system clock for this cabinet.

— **unavail**

If the system has an EPN that is currently down, then **unavail** is displayed for the Tone-Clock.

— **<blank>**

If the system is Simplex, then the 1B Tone-Clock for the PPN will display a blank. If the system does not have an EPN, then both the 1A and 1B Tone-Clock for this EPN will display a blank.

SYSTEM TONE	This field shows which Tone-Clock circuit pack supplies the system tones for the cabinet being displayed. — **active** This Tone-Clock is active and is supplying the system tones for this cabinet. — **standby** This Tone-Clock is standby and is ready to supply the system tones for this cabinet if the active clock fails. — **down** This Tone-Clock has failed some maintenance activity and can not supply the system tones for this cabinet. — **unavail** If the system has an EPN that is currently down, then **unavail** is displayed for the Tone-Clock. — **<blank>** If the system is Simplex, then the 1B Tone-Clock for the PPN will display a blank. If the system does not have an EPN, then both the 1A and 1B Tone-Clock for this EPN will display a blank.
TDM	The TDM Bus identifier. Valid identifiers are **1A**, **1B**, **2A**, **2B**, **3A** and **3B**.
SERVICE STATE	The operational state of the TDM Bus circuit pack. The possible states are as follows: — **in** The TDM Bus is installed in the system and is in-service. — **out** The TDM Bus has failed certain maintenance tests and has been removed from service.
CONTROL CHANNEL	Indicates whether the control channel is on this TDM Bus. Either **y**(es) or **n**(o) is displayed.
DEDICATED TONES	Indicates whether the dedicated tones are on this TDM Bus. Either **y**(es), **n**(o) is displayed.

PKT	The Packet Bus identifier, which is the same as the cabinet number. Valid Packet Buses are **1**, **2** and **3**. If the system is running on a X75XE cabinet all the PKT fields will be blank and the following will be displayed instead: **S75XE does not support Packet** Refer to Packet Bus Maintenance descriptions for more information.
SERVICE STATE	The operational state of the Packet Buses. Possible states are: — **in** The Packet Bus is in-service and operating normally. — **out** The Packet Bus has failed certain maintenance tests and has been removed from service. — **reconfig** The Maintenance/Test circuit pack has swapped one or more signal leads because of lead faults detected during testing (High or Critical Reliability System only). — **open lds** The Maintenance/Test circuit pack can not correct all of the Packet Bus faults. There are open leads, but the Packet Bus is still at least partly functional (on a High or Critical Reliability System only). — **unavail** If the system has an EPN that is currently down, then **unavail** is displayed for the Packet Bus. — **<blank>** If the system does not have the Packet Bus feature, a blank is displayed.
BUS ALARMS-MAJOR	This **y**(es) or **n**(o) field shows whether Major alarms exist for packet bus components.
BUS ALARMS-MINOR	This **y**(es) or **n**(o) field shows whether Minor alarms exist for packet bus components.

BUS FAULTS	This field indicates the number of faulty bus leads, where a fault is defined as either shorted to another lead, stuck at some value or an open lead. This field may take on any integer between 0 and 24. The system displays a blank if the Maintenance/Test circuit pack is not present, if the Packet Bus port of the Maintenance/Test circuit pack has been taken out-of-service or if the system does not have the Packet Bus feature.
OPEN BUS LEADS	This field indicates the number of bus leads which tests indicate have an open circuit between the Maintenance/Test circuit pack and bus terminator. Bus leads test open as a result of physical damage to the backplane or its connectors OR because a bus terminator is missing. This field may contain values between 0 and 24. The system displays a blank if the Maintenance/Test circuit pack is not present or has been take out-of-service, if the Packet Bus port of the Maintenance/Test circuit pack has been take out-of-service or if the system does not have the Packet Bus feature.
EMERGENCY TRANSFER	The location of the Processor or EPN Maintenance circuit pack containing the Emergency Transfer Select Switch is displayed. Valid locations are **1A** and **1B** for the PPN, and **2A** or **3A** for the EPNs.

SELECT SWITCH The position of the Emergency Transfer Switch on the Processor(s) or the EPN maintenance circuit pack and the state of Emergency Transfer in the cabinet are displayed as follows:

— **on**

The switch is in the right position. If this is a Simplex PPN or an EPN, then designated analog phones in this cabinet are cut through to CO trunk lines. The switch should only be in this state in an emergency situation. In a High or Critical Reliability System, the Emergency Transfer Switches on both SPEs in the PPN must be in the **on** position before Emergency Transfer is invoked for the PPN.

— **off**

The switch is in the left position and regardless of Simplex or Duplex, PPN or EPN, Emergency Transfer is off and can not be invoked by the system software. The switch should only be in this state when a service technician is on sight.

— **auto-on**

The switch is in the or auto position, however, because of a serious system fault, system software has invoked Emergency Transfer.

— **auto-off**

The switch is in the or auto position and because the system has no serious faults, system software has **not** invoked Emergency Transfer.

— **unavail**

If the system has an EPN that is currently down, then **unavail** is displayed for the Emergency Transfer.

— **<blank>**

If the system is Simplex, then the 1B Emergency Transfer indication for the PPN will display a blank. If the system does not have an EPN, then both the 1A and 1B Emergency Transfer indications for the EPN will display a blank.

EXP-LINK

An identifier of the Expansion Links that originate from this cabinet showing the locations of the two Expansion Interface circuit packs that make up the link. If the Expansion Link does not exist in the system then a **-** is displayed.

The following are valid Expansion Link identifiers for the PPN or Cabinet 1:

"**1A01-2A01**", "**1B01-2B02**", "**1A02-3A01**", "**1B02-3B02**"

The following are valid Expansion Link identifiers for the first EPN or Cabinet 2:

"**1A01-2A01**", "**1B01-2B02**", "**2A02-3A02**", "**2B03-3B03**"

The following are valid Expansion Link identifiers for the second EPN or Cabinet 3:

"**1A02-3A01**", "**1B02-3B02**", "**2A02-3A02**", "**2B03-3B03**"

SERVICE STATE

The operational state of the Expansion Interface Link. The possible states are as follows:

— **in**

The Expansion Interface Link is installed in the system and is in-service.

— **out**

The Expansion Interface Link has failed certain maintenance tests and has been removed from service.

— **<blank>**

The Expansion Interface Link does not exist in the system.

MODE

— **active**

The Expansion Interface Link is in-service and is providing the active connectivity between the two cabinets.

— **standby**

The Expansion Interface Link is in-service and is ready to provide connectivity between the two cabinets should the active link fail.

— **down**

The Expansion Interface Link is out-of-service and can not provide connectivity between the two cabinets.

— **<blank>**

The Expansion Interface Link does not exist in the system.

CABINET TYPE — Indicates the type of physical cabinet containing this cabinet.

- **MCC-**

  A Medium Carrier Cabinet capable of supporting up to 5 carriers. A MCC in an PPN can run a 286 or a 386 Processor. A MCC can run as either simplex or duplex as a PPN.

- **SCC**

  A Single Carrier Cabinet capable of supporting up to 4 carriers. A SCC in an PPN can run a 286 or a 386 Processor. A SCC can run as either simplex or duplex as a PPN.

- **EMCC-**

  A Enhanced Medium Carrier Cabinet capable of supporting up to 5 carriers. A EMCC can only be a PPN cabinet and always runs a 386 Processor. A EMCC can run as either simplex or duplex as a PPN.

- **ESCC-**

  A Enhanced Medium Carrier Cabinet capable of supporting up to 4 carriers. A ESCC can only be a PPN cabinet and always runs a 386 Processor. A ESCC can run as either simplex or duplex as a PPN.

- **MICRO**

  A Mirco or Wall Mounted cabinet always exists alone as an A carrier in the PPN and always runs a 386 Processor. A MICRO cabinet can be only used in simplex systems.

- **S75XE**

  A S75XE cabinet is a System 75 R1V3 PPN cabinet modified to run as the A carrier in the PPN and always runs a 386 Processor. A S75XE cabinet can be only used in simplex systems.

The following is an example of the fields contained on the output form.

```
status system all-cabinets                 Page  1 of  3   SPE B


                        SYSTEM STATUS CABINET 1

                           SELECT  SPE ALARMS    TONE/  SERVICE SYSTEM  SYSTEM
SPE MODE                   SWITCH  MAJOR MINOR   CLOCK  STATE   CLOCK   TONE
1A  busyout/not-refreshed  auto      n     y     1A     in      standby standby
1B  active                 auto      n     n     1B     in      active  active


    SERVICE   CONTROL  DEDICATED       SERVICE  BUS ALARMS   BUS   OPEN BUS
TDM  STATE    CHANNEL    TONES    PKT   STATE  MAJOR MINOR  FAULTS  LEADS
1A    in         y         n      1       in     n     n       0      0
1B    in         n         y


EMERGENCY   SELECT                SERVICE        CABINET
TRANSFER    SWITCH    EXP-LINK    STATE   MODE      TYPE
1A          auto-off  01A01-02A01  out    down     SCC
1B          auto-off  01B01-02B02  in     active
                      01A02-03A01  in     active
                      01B02-03B02  in     standby
```

FEATURE INTERACTIONS

None.

status trunk

This command displays the status of an individual trunk group member or all of the members in a particular group.

SYNOPSIS

status trunk group*/member print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, rcust, bcms, init, browse.

EXAMPLES

status trunk 78
status trunk 80
status trunk 78/1
status trunk 80/2
status trunk 80/2 print

DESCRIPTION

The status trunk command displays internal software state information for diagnosis. This command can help locate facilities to which the trunk is communicating.

If a trunk group number is entered without a member number, a list showing the status for each member in the specified group is displayed. If a trunk group number and member number are both entered, only status for the specified member is displayed.

Defaults

None.

Parameters

group	The group number is an administered number associated with each trunk group. The valid range is 1 - 99. If a group number is entered without a member number, a list showing the status of each member in the group is displayed.
member	The member number is an administered number identifying a particular member within a trunk group. The valid range is 1 - 99. If a member number is entered, status for that member only is displayed.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status trunk", the following message is displayed:

```
Enter assigned trunk group(1-99)
or [group/member(1-99)], [‘print‘]
```

Error Messages

If the format of the trunk identifier is incorrect, the following error message is displayed:

```
Format invalid
```

If the trunk identifier is not in the valid range, the following error message is displayed:

```
Trunk or trunk group invalid
```

If the trunk group is not administered or has no members, the following message is displayed:

```
Group not assigned, or group assigned
but with no member
```

If the trunk group member is not administered, the following message is displayed:

```
Group member not assigned
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

MEMBER OUTPUT

The following is output when a user enters a trunk group and member:

Trunk Group/Member	The trunk group number and group member number. Valid identifiers are 1-99/1-99.
Port	The port location (cabinet-carrier-slot-circuit) of the trunk.
Signaling Group ID	If the trunk is of type ISDN, then this field contains the number of the ISDN Signaling Group to which this group belongs. Otherwise, this field is blank.
Connected Ports	Port locations (cabinet-carrier-slot-circuit) connected to the trunk.
Service State	Whether the trunk is in service or out of service. One of the following states is displayed: in-service/active, in-service/idle, out-of-service, out-of-service-NE (Near End), out-of-service-FE (Far End), maint-NE/active, maint-FE/active, maint-NE/idle, maint-FE/idle, pending-in-service, pending-maint, or disconnected. NE (Near End) and FE (Far End) refer to which "end" of the trunk has placed the facility in the state that it is in.
Maintenance Busy	Whether there is any maintenance testing being performed upon the trunk.
CA-TSC State	The state of the temporary signaling connection. A temporary signaling connection is a connection set up to pass call information over PRI signaling links.

For the following output example, the command that was entered is "status trunk 78/1".

```
status trunk 78/1


                           TRUNK STATUS

Trunk Group/Member: 078/001            Service State: in-service/idle
              Port: 01C1505         Maintenance Busy? no
Signaling Group ID:                     CA-TSC State:
   Connected Ports:
```

GROUP OUTPUT

The following is output when a user enters only a trunk group:

Member	The trunk group number and group member number. Valid identifiers are 1-99/1-99.
Port	The port location (cabinet-carrier-slot-circuit) of the trunk.
Service State	Whether the trunk is in service or out of service. One of the following states is displayed: in-service/active, in-service/idle, out-of-service, out-of-service-NE (Near End), out-of-service-FE (Far End), maint-NE/active, maint-FE/active, maint-NE/idle, maint-FE/idle, pending-in-service, pending-maint, or disconnected. NE (Near End) and FE (Far End) refer to which "end" of the trunk has placed the facility in the state that it is in.
Mtce Busy	Whether there is any maintenance testing being performed upon the trunk.
Connected Ports	Port locations (cabinet-carrier-slot-circuit) connected to the trunk.

For the following output example, the command that was entered is "status trunk 78".

```
status trunk 78


                       TRUNK GROUP STATUS

Member   Port    Service State    Mtce Connected Ports
                                  Busy
078/001  01C1505 in-service/idle  no
078/002  01C1506 in-service/idle  no
```

FEATURE INTERACTIONS

None.

status tsc-administered

This command displays the operational status of Temporary Signaling Connections (TSCs) for a signaling group.

SYNOPSIS

status tsc-administered signaling group #/*tsc index print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

status tsc-administered 1
status tsc-administered 1/1
status tsc-administered 1/2 print

DESCRIPTION

The status tsc-administered command displays the operational status of TSC's administered for an administered signaling group. The status represents the state of the TSC according to switched services.

Defaults

None.

Parameters

signaling group #	An administered number associated with each signaling group.
tsc index	A number associated with each TSC in a signaling group.
print	This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status tsc-administered" the following message will be displayed:

```
Enter sig group # (1-8) /tsc index # (1-64),
                  ['print']
```

Error Messages

If the format for the specified signaling group or the signaling group and TSC is incorrect, the following message is displayed:

```
Format invalid
```

If the specified signaling group number is out of range, the following message is displayed:

```
Signaling group invalid
```

If the specified signaling group is not administered, the following message is displayed:

```
No signaling group assigned
```

If the specified signaling group has no TSC assigned or the specified TSC is unadministered, the following message is displayed:

```
No TSC assigned
```

If the specified TSC number is out of range, the following message is displayed:

```
Tsc index invalid
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

TSC Index	The administered TSC index (1-64).
TSC State	The state of the administered TSC. A state of "inactive" means that the administered TSC is not functioning (i.e. D-channel out-of-service, or disabled, etc.). A state of "active" indicates that the administered TSC is up and user information can be exchanged end-to-end. A state of "pending-inactive" shows that the TSC is being released. A state of "pending-active" means that the TSC is about to come up.
Establish	This field refers to the switch responsible for the origination of the administered TSC. A state of "as-needed" shows that the TSC is established on an as needed basis. A state of "permanent" shows that the TSC is permanently established.
Enabled	Indicates if the administered TSC's have been enabled ("yes" or "no").
Congested	This field indicates the administered TSC congestion history (i.e. whether the network can handle the receipt of USER INFORMATION messages for the administered TSC). A "yes" in this field indicates that the administered TSC is congested. A "no" indicates that the administered TSC is not congested. A "clear" in this field denotes the administered TSC congestion was cleared during its' active period.

For the following output example, the command that was entered was "status tsc-administered 1/1".

```
status tsc-administered 1/1


         ADMINISTERED NON-CALL-ASSOCIATED TSC STATUS

TSC      TSC
Index    State        Establish   Enabled   Congested
1        inactive     as-needed   yes       no
```

FEATURE INTERACTIONS

None.

status tti

This command displays the status of the TTI (Terminal Translation Initialization) background maintenance task.

SYNOPSIS

status tti *print*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust init, nms, browse.

EXAMPLES

status tt
status tti print

DESCRIPTION

The status tti command displays the status (active/not active) of the tti background maintenance task and if it is active, then it will display whether tti ports are being generated or removed, the number of tti-supported boards that have processed, and the number of tti-supported boards that have not yet been processed. The display also includes the elapsed time since the background maintenance task started.

Defaults

No defaults.

Parameters

print This will cause the report to be printed if a printer is linked to the SAT.

Help Messages

If the system technician presses HELP after entering "status tti", the following message will be displayed:

```
['print']
```

Error Messages

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit.
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later.
```

OUTPUT

TTI Background Task State:	The state of the tti background maintenance task: generating tti ports, removing tti ports, suspended, not active, completed - all ports translated, completed - some ports not translated. If the last execution of the background task completed normally, then "completed - all ports translated" is displayed here. If the task completed due to resource exhaustion with some ports left untranslated, then "completed - some ports not translated" is displayed in this field.
TTI State:	The tti state field contains "off" if the TTI feature is not enabled for the system or if it is enabled then it contains what kind of tti ports are being generated or removed: voice, data.
# of Boards Completed:	The number of TTI-supported boards that have had been processed by the background maintenance task. A "completed" board has either had all its unadministered ports translated as TTI ports or its TTI ports have been removed and are now unadministered ports. This depends on whether the TTI background task is generating or removing tti ports.

# of Boards Left to Process:	The number of TTI-supported boards that have not yet been processed by the background maintenance task.
Percent Complete:	A ratio of the of number of boards completed and the number of boards left to process.
Elapsed Time since Task Started:	The amount of time that has elapsed since the TTI background task was started. If the task is "not active", then this field will blank. If the task is "completed" it will indicate the length of time it took to complete the task. If the task is "suspended", then it will display the elapsed time at the point the task was suspended. The time is displayed in the HH:MM format where HH is hours and MM is minutes.

For the following output example, the command "status tti" was entered.

```
status tti                            Page 1 of 1


                             TTI STATUS

        TTI Background Task State:  generating tti ports
                        TTI State:  voice
            # of Boards Completed:  30
      # of Boards Left to Process:  120
                 Percent Complete:  25
  Elapsed Time since Task Started:  0:15
```

FEATURE INTERACTIONS

The TTI Background maintenance task is activated by enabling the TTI system parameter on the system-parameters features administration form.

test access-endpoint

This command will perform hardware diagnostic tests on all port circuits that are associated with the specified access endpoint extension.

SYNOPSIS

test access-endpoint extension *[short | long] repeat number schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test access-endpoint 25012
test access-endpoint 45002 sh
test access-endpoint 45892 l
test access-endpoint 24389 sh r 4
test access-endpoint 34899 l r 6
test access-endpoint 34912 l r 5 schedule
test access-endpoint 93483 r 2
test access-endpoint 10022 c
test access-endpoint 92349 schedule

DESCRIPTION

The test access-endpoint command performs hardware diagnostic tests on all port circuits that are associated with the specified access endpoint.

Defaults

The default for the command is short with repeat number of 1.

Parameters

extension	The extension of the access endpoint to be tested. The number of digits in an extension is determined by the dial-plan.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of nondestructive diagnostic tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the user presses HELP after entering "test access-endpoint", the following message is displayed:

```
Enter extension number, ['long' or 'short'],
     ['repeat' (1-100)], ['schedule']
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the access endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not an access endpoint, the following message will be displayed:

```
Extension assigned to object
other than access-endpoint
```

If the board that contains the access endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a port-by-port and test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested. For wideband access endpoint the maintenance name for each port is "WAE-PORT". For single port access endpoint the maintenance name is "TIE-DS1".
Alt. Name	The alternate way of identifying the maintenance object. This field contains the extension number of the access endpoint.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, the command "test access-endpoint 22502" was entered. Assume that the access endpoint ports for extension 22502 are in cabinet 1, carrier C, slot 11, circuit 1 to 6.

```
test access-endpoint 22502 short                   page 1 of 1


                             TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result      Error Code
  01C1101   WAE-PORT          22502       36     PASS
  01C1102   WAE-PORT          22502       36     PASS
  01C1103   WAE-PORT          22502       36     PASS
  01C1104   WAE-PORT          22502       36     PASS
  01C1105   WAE-PORT          22502       36     PASS
  01C1106   WAE-PORT          22502       36     PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test alarms

This command tests the hardware associated with selected alarms

SYNOPSIS

test alarms *auto-page failures step [short | long][repeat number | clear]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test alarms
test alarms step failures
test alarms long clear auto-page
test alarms long failures

DESCRIPTION

This command allows the technician to automatically test all of the hardware that is associated with the active alarms in the alarm log. This command provides a query form to help the user narrow the selection of alarmed objects. Once the form is filled out, the user presses "ENTER" and the hardware associated with the selected alarm log entries is tested. The results will be displayed in standard test output and status information will be displayed on the message line as the command progresses.

Several alarms may be logged against a single maintenance object, each alarm representing a different problem. Even if there are multiple entries in the alarm log for a single object, the test alarms command will only test each physical object once.

Defaults

The default options for this command are: short, repeat of 1.

Parameters

auto-page	This option provides the ability to continue testing and displaying test results, by providing a new screen every time the SAT screen is filled with test results. The screen does not scroll to accommodate new results; instead a new screen is provided after the current screen fills up. If the auto-page option is not specified, the SAT screen will not be refreshed once it is filled with test results and testing will stop until the user enters the "PAGE" key to continue or the "CANCEL" key to halt the testing.
failures	This requests that only the failures be displayed on the screen. All passes will not be displayed on the output screen. Hardware failures as well as aborts, conflicts and EPN-down failures will be displayed.
step	This option will allow the user to step to the next or previous alarm and not have the current alarm tested. When this option is specified, the user is presented with the alarm information and prompted for a keypress. The user may enter CANCEL to abort the command, ENTER to test the currently displayed alarm, NEXT ALARM (function key) to move to the next alarm, PREV ALARM (function key) to move to the previous alarm without testing the currently displayed alarm. If this option is given, then the NEXT ALARM (function key) or PREV ALARM (function key) may be pressed at any time during the command (even during test results). If the NEXT ALARM or PREV ALARM is pressed during a test, the test is aborted, testing of the current alarm stops, and the next alarm or previous alarm is displayed. If the first alarms is displayed, and the PREV ALARM is pressed, then the last alarm is displayed. Also, if the last alarm is currently displayed, and the NEXT ALARM is requested, then the first alarm will be shown. **NOTE:** When this option is given the only way to terminate this command is to press CANCEL.
short	This will cause the command to execute a series of nondestructive diagnostic tests.

long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm is cleared or a single test in the sequence fails. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Executing a clear with short option, may not clear all alarms even if all tests pass.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

Help Messages

If the technician presses HELP after entering "test alarms" the following message will be displayed:

```
Enter ['auto-page'], ['failures'], ['step'],
['short' or 'long'], ['repeat' (1-100) or 'clear']
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

QUERY FORM INPUT

After entering the command "test alarms", the system technician will be presented with an options form for alarm selection.

```
test alarms repeat 1


            HARDWARE TEST ALARM QUERY

    The following options control which alarms will be tested.

    ALARM TYPES
          Major? y_     Minor? y_    Warning? y_

        REPORT PERIOD
         Interval: m_  From: __/__/__:__  To: __/__/__:__

    EQUIPMENT TYPE ( Choose only one, if any, of the following )
                         Cabinet: __
                    Port Network: __
                    Board Number: ____
                            Port: ______
                        Category: ________
                       Extension: _____
            Trunk ( group/member ): __/__
```

Alarm Types	The type of alarm to be tested is specified by placing a ’y’ or ’n’ in the alarm type fields. The technician can choose a combination of active alarms: major, minor, and/or warning.
Interval	Test alarms for records for the last hour (h), last day (d), last week (w) or all (a). The default is all.
From	Test alarm associated with records from the time specified by mm/dd/hh/mm, where mm month, dd is the day, hh is the hour and mm is the minute. If no "from" date is entered, then no checking is done. This will give the user all the alarms active since a month prior to the current time.
To	Test alarms associated with records to the time specified by mm/dd/hh/mm, where mm is the month, dd is the day, hh is the hour and mm is the minute. If no "to" date is entered, any alarm which is active after the from date will be selected.

Equipment Type

The technician can choose between five different equipment types. If there is no input to any of these fields, the system will default to all the equipment. The user can select one of the following fields:

- Cabinet: This allows the technician to test all alarms associated with a particular cabinet. Alarms for a cabinet are referenced by a number ranging from 1 to 3 which is assigned during cabinet administration.
- Port Network: This allows the technician to test all alarms associated with a particular port network. Alarms for a port network are referenced by a number ranging from 1 to 3.
- Board Number: This allows the technician to choose all alarms associated with a particular circuit pack for testing. Alarms for a circuit pack are referenced by circuit pack location (cabinet-carrier-slot). If the cabinet number is omitted, the system will default to 1.
- Port: This allows the technician to choose all alarms associated with a particular port on a circuit pack for testing. Alarms for a port circuit are referenced by port location (cabinet-carrier-slot-circuit). If the cabinet number is omitted, the system will default to 1.
- Category: Alarms for a particular equipment category.
- Extension: Alarms associated with an extension number.
- Trunk (group/member): The technician can choose to test all alarms associated with a particular trunk group or trunk group member. The group identifier should be entered to test all alarms associated with a trunk group (XX/__). The group identifier and member identifier should both be entered to test all alarms associated with a specific trunk group member (XX/XX).

Field Help

Following are the help messages that the system technician will see upon tabbing to the specified field and pressing the HELP key.

Major?	"n(o) y(es)"
Minor?	"n(o) y(es)"
Warning?	"n(o) y(es)"
Interval:	"m(onth), h(our), d(ay), w(eek), a(ll)"
From month	"Enter month between 1-12"
From (day)	"Enter day between 0-31"
From (hour)	"Enter hour between 0-23"
From (minute)	"Enter minute between 0-59"
To (month)	"Enter month between 1-12"
To (day)	"Enter day between 0-31"
To (hour)	"Enter hour between 0-23"
To (minute)	"Enter minute between 0-59"
Cabinet:	"Enter cabinet number (1-3)"
Port Network:	"Enter port network number (1-3)"
Board Number:	"Enter 4 character board number; [cabinet(1-3)]:carrier(A-E):slot(0-21)"
Port:	"Enter port number; [cabinet(1-3)]:carrier(A-E):slot(0-21):circuit(1-24)"
Category:	"adm-conn, announce, bri/asai, card-mem, cdr, data-mod, detector, dup-spe, environ, ext-intf, ext-dev, generatr, inads-link, infc, maint, mbus, memory, misc, mnt-test, modem, netcon, pkt, pkt_ctrl, quick-st, pms/jrnl, procr, s-syn, stabd, stacrk, stations, sys-prnt, tape, tdm, tone, trkbd, trkcrk, trunks and wideband" (For a table describing the category entries in greater detail, see the "display errors" command.)
Extension:	"Enter assigned extension, or blank"
Trunk (group)	"Enter group number between 1-99"
Trunk (member)	"Enter group member between 1-99, or blank"

Field Error Messages

Following are the error messages that will be displayed on the screen. The messages are displayed when the system technician tabs out of a field and the validation routines are executed. In the following messages, an "x" represents the character that was entered by the user.

Major?	""x" is an invalid entry; please press HELP"
Minor?	""x" is an invalid entry; please press HELP"
Warning?	""x" is an invalid entry; please press HELP"
Interval:	""x" is an invalid entry; please press HELP key"
From (month)	"Entry must be all digits"
From (day)	"Entry must be all digits"
	"Day invalid"
From (hour)	"Entry must be all digits"
	"Hour invalid"
From (minute)	"Entry must be all digits"
	"Minute invalid"
To (month)	"Entry must be all digits"
To (day)	"Entry must be all digits"
	"Day invalid"
To (hour)	"Entry must be all digits"
	"Hour invalid"
To (minute)	"Entry must be all digits"
	"Minute invalid"
Cabinet:	"Invalid entry"
Port Network:	"Port Network invalid"
Board Number:	"Invalid entry"
Port:	"Port invalid"
Category:	""xxxxxxxx" is an invalid entry; please press HELP"

Extension:	"Entry must be all digits"
	"Extension not assigned"
Trunk (group)	"Entry must be all digits"
	"Group not assigned, or group assigned but with no member"
Trunk (member)	"Entry must be all digits"
	"Number invalid""
	"Group member not assigned"
	"Trunk or trunk group invalid"

OUTPUT

The responses, with normal output, will be displayed on a test-by-test basis with one line of data displayed for each test result. With the failures option only the tests that have failed will be displayed.

The following output fields are for the ALARM ENTRY section:

Port	The location of the alarmed object (cabinet-carrier-slot-circuit). This is the same identifier as used by the alarm log.
Maintenance Name	The logical name of the maintenance object which has been alarmed.
On Board	Whether the fault detected is on the associated circuit pack, or an off board element connected to the circuit pack.
Alt Name	Terminal extension numbers or trunk group numbers.
Alarm Type	Major, Minor, or Warning. This is an indicator to the seriousness of the alarm raised.
Service State	RDY (ready for service), OUT (out of service), or IN (in service). This is the current service state of the station and trunk ports shown.
Ack	The columns under the “1” and “2” headings denote if the alarm has been acknowledged by the first and second OSS telephone numbers, respectively.
Date Alarmed	Day, hour, and minute of alarm.
Alarm Count	This field contains the count of the current alarm entry verses the total number of alarms to be tested.

The following fields are displayed for the test results:

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Test No	The actual test that is being executed.
Result	An indicator as to whether the test failed, passed, aborted or no hardware was available (no board). If this field has conflict, this means that another user was testing this hardware. If this field has epn-down it means that the epn is inaccessible at this time.
Error Code	A numerical description of why the test failed or was aborted.

When errors are encountered preparing a particular object to be tested (not inserted, contention, etc.) the an error message will be displayed. This error message will be displayed in the TEST RESULTS data.

For the following output example, assume that only one alarm was in the alarm log and it is on the board in cabinet 1, carrier c, slot 7. The command that was entered was "test alarms" and the query form was left empty by just pressing "ENTER"

.

```
test alarms                                                                Page   1

                                 ALARM ENTRY
Port       Maintenance On   Alt     Alarm   Svc    Ack?  Date         Alarm
           Name        Brd? Name    Type    State  1 2   Alarmed      Count

01C03      UDS1-BD     n            WARNING              03/06/16:48 1/4

                                 TEST RESULTS
Port      Maintenance Name  Alt. Name Test No. Result            Error Code

01C03     UDS1-BD                     138      NO BOARD
01C03     UDS1-BD                     139      NO BOARD
01C03     UDS1-BD                     140      NO BOARD
01C03     UDS1-BD                     141      NO BOARD
01C03     UDS1-BD                     142      NO BOARD
01C03     UDS1-BD                     143      NO BOARD
01C03     UDS1-BD                     144      NO BOARD
01C03     UDS1-BD                     145      NO BOARD
01C03     UDS1-BD                     146      NO BOARD
Testing completed for this object.

                press CANCEL to quit --  press NEXT PAGE to continue
```

FEATURE INTERACTIONS

With the enhancement of multiple maintenance users, there may be a possibility of two users attempting to test the same physical hardware (for example, one via the test alarms command and another through the test board command). If this command should attempt to test a board that is currently being tested by another user, a error message is displayed.

test analog-testcall

This command will place an analog test call on a trunk or a group of trunks.

SYNOPSIS

test analog-testcall [trunk group number*/member number* **|** port location **|** board location] *[full | supervision | no-selftest | no-return-loss | no-st-or-rl][repeat number] schedule*

PERMISSIONS

The following logins may execute this command: system technician, inads, cust, init.

EXAMPLES

test analog-testcall trunk 78 f
test analog-testcall trunk 78 f schedule
test analog-testcall trunk 80/1 s r 2
test analog-testcall trunk 80/1 s r 2 schedule
test analog-testcall trunk 78/2 no-selftest r 10
test analog-testcall trunk 78/2 no-selftest r 10 schedule
test analog-testcall trunk 78 r 4
test analog-testcall trunk 78 r 4 schedule
test analog-testcall port 2a1505 no-st-or-rl r 4
test analog-testcall port 2a1505 no-st-or-rl r 4 schedule
test analog-testcall board 2a15
test analog-testcall board 2a15 schedule
test analog-testcall port 2a1505 no-return-loss
test analog-testcall port 2a1505 no-return-loss schedule
te an t 80
te an t 80 schedule

DESCRIPTION

The test analog-testcall command performs facility diagnostic tests on an entire trunk group, an individual trunk group member, an individual trunk port or on all trunks on a board, depending on the options entered by the technician. The type of test call, the far end test line number and the various other test call related parameters must be administered on the trunk group form before executing the command. presses HELP

Normally the user should only invoke the full or supervision test. The other options are provided primarily for testing when setting up an ATMS schedule.

Defaults

The default for the command is full with the repeat of 1.

Parameters

group number	The group number is an administered number associated with each trunk group.
member number	The member number is an administered number identifying a particular trunk within a trunk group. If a group number is entered, and no member number is given, then all trunks in the group will be tested.
location	A "location" represents the physical position of the board or port to be tested and is entered as "UUcSSpp" where "UU" represents the cabinet number, "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit. A cabinet number (1 - 3) may be entered. The "pp" should be omitted for a board location.
full	This will execute the most comprehensive test call available using the administered test set type.
supervision	This will cause the system to execute a supervision only test call. It will take about 10 seconds and will only confirm the presence of the test set at the far end.
no-selftest	This will execute the "full" test, but will skip any self test sequences. This saves about 20 seconds on the type 105 transmission test and will not have any effect on type 100 transmission tests or on type 102 transmission tests.
no-return-loss	This will execute the "full" test, but will skip any return loss sequences. This saves about 20 seconds on the type 105 transmission test and will not have any effect on type 100 transmission tests or type 102 transmission tests.
no-st-or-rl	This will execute the "full" test, but will skip all self test and return loss sequences. This saves about 40 seconds on the type 105 transmission test and will not have any effect on type 100 transmission tests or type 102 transmission tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.

schedule — When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test analog-testcall" a message showing the following keywords is displayed:

```
trunk  board    port
```

If the system technician presses HELP after entering "test analog-testcall trunk," the following message will be displayed:

```
Enter group number or group number/member number,
   ['full' or 'supervision' or   'no-selftest'
     or 'no-return-loss' or 'no-st-or-rl'],
         ['repeat 1-100'], ['schedule']
```

If the system technician presses HELP after entering "test analog-testcall port" the following message will be displayed:

```
Enter trunk port number ['full' or 'supervision'
      or 'no-selftest' or'no-return-loss'
or 'no-st-or-rl'], ['repeat 1-100'], ['schedule']
```

If the system technician presses HELP after entering "test analog-testcall board" the following message will be displayed:

```
Enter trunk board number, ['full' or 'supervision'
      or 'no-selftest' or 'no-return-loss'
or 'no-st-or-rl'], ['repeat 1-100'], ['schedule']
```

Error Messages

If the format for the trunk location is incorrect, the following error message would be displayed:

```
Format invalid
```

If the trunk group or member range is invalid, the following message will be displayed:

```
Trunk or trunk group invalid
```

If the board is not inserted, the following message will be displayed:

```
Board not inserted
```

If the specified board does not have any maintenance objects associated with it, the following message will be displayed:

```
No MO in this board
```

If the EPN on which the board resides is not available, the following message will be displayed:

```
EPN is not available
```

If there is a software communication problem, the following message will be displayed:

```
Error encountered, can’t complete request
```

If the trunk group is not administered, the following message will be displayed:

```
Group not assigned, or group
assigned but with no member
```

If the trunk group member is not administered, the following message will be displayed:

```
Group member not assigned
```

If no tests can be found for the associated MO, the following message is displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

If the format for the board or port location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO (for example, CO_TRK Transmission Tests (#844-849).

For the following output example, assume that the command that was entered was "test analog-testcall trunk 78".

```
test analog-testcall trunk 78


                           TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C1505   CO-TRK             78/1     845      PASS
  01C1507   CO-TRK             78/2     845      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Additional data is available after running a test. See the list measurements test-calls command for details on how to access the additional data.

If the trunk is in use by call processing the test will abort.

If the trunk is in use by maintenance, the test will queue and will run when the current maintenance activity finishes.

test board

This command will perform a set of hardware diagnostic tests on the specified circuit pack. The tests will vary according to the type of pack and short or long request.

SYNOPSIS

test board location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test board 01c11 l
test board 01c11 l schedule
test board 02e15 sh r 2
test board 01c08
test board 02d12 r 4
test board 02d12 c

DESCRIPTION

The test board command will validate that the board exists at the specified location. Based on the logical type (e.g., Analog, Digital, Hybrid, etc.) of board a series of tests will be executed. Each individual test will exercise diagnostics on the board and then return results of the test along with any possible error codes.

Some of the tests can be disabled by administering forms on the administration terminal.

Defaults

The default for the command is short with the repeat of 1.

Parameters

location	A "location" represents the physical position of the board to be tested. For R3 Standard cabinets a location is entered as "UUcSS" where "UU" represents the cabinet number, "c" represents the carrier, and "SS" represents the slot position. A single digit cabinet (1 - 9) may be entered with or without a leading zero (0).
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test board" the following message will be displayed:

```
Enter board location, ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the format for the board location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN in which the specified board resides is not available, the following message will be displayed:

```
EPN is not available
```

If the specified board is not configured in the system, the following message will be displayed:

```
Board not assigned
```

If the request for all maintenance objects associated with the board fails, the following message will be displayed:

```
No MO in this board
```

If no tests can be found for the associated MO, the following message will be displayed:

```
No tests for this MO
```

If the specified board is a Switch Node Interface (SNI) board which resides on the active Port Network Connectivity (assuming PNC is duplicated) and a long test has been specified, the following message will be displayed:

```
Must busyout specified object first
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the board in cabinet 1, carrier c, slot 7 is an analog board with three ports administered. The command that was entered was "test board 1c07".

```
test board 01C07 short


                           TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result        Error Code
  01C07     ANL-BD                      51       PASS
  01C07     ANL-BD                      52       PASS
  01C0703   ANL-LINE                    35       PASS
  01C0703   ANL-LINE                    48       PASS
  01C0703   ANL-LINE                    36       PASS
  01C0701   ANL-LINE                    35       PASS
  01C0701   ANL-LINE                    48       PASS
  01C0701   ANL-LINE                    36       PASS
  01C0702   ANL-LINE                    35       PASS
  01C0702   ANL-LINE                    48       PASS
  01C0702   ANL-LINE                    36       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Destructive long tests on a Switch Node Interface (SNI) board will not be allowed unless the board has been busied out.

test card-mem

This command will initiate a test sequence on the specified memory card.

SYNOPSIS

test card-mem location *[short | long] [repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: init, inads, system technician.

EXAMPLES

test card-mem
test card-mem a l
test card-mem b sh r 2
test card-mem a sch
test card-mem a c

DESCRIPTION

The "test card-mem" command executes a sequence of tests on the memory card in the specified switch processor element. The test sequences in order for both "long" and "short" versions are described in the following table:

TEST	Included In Short?	Included In Long?
12 Volt Power Supply Test (#701)	Yes	Yes
Memory Card Insertion Test (#695)	Yes	Yes
Memory Card Format and Read Test (#696)	Yes	Yes
Memory Card Match Test (#697)	Yes	Yes
Memory Card Write-Protected Test (#698)	Yes	Yes
Memory Card Directory Recovery Test (#699)	Yes	Yes
Memory Card Translation Data Integrity Test (#694)	No	Yes
Memory Card Erase/Write/Read Test (#693)	No	Yes
Memory Card Capacity Test (#1014)	No	Yes
Flash Data Consistency Test (#421)	No	Yes

The tests in the sequence can verify the sanity of the memory card device, the basic read/erase/write operations to the memory card, the integrity of the translation data stored in the memory card, the function of 12 volt power supply in TN777B NETCON circuit pack used for memory card erase/write operations, the translation capacity of the memory card, and the consistency of data stored in both memory cards in a High or Critical Reliability System. This command can help system technician to trouble-shoot the hardware errors related to maintenance objects such as "CARD-MEM", "12V-PWR", CAP-MEM, and "FL-DATA" logged in the system hardware error log. The details of test results and the repair procedures for recovery are described in Maintenance Service Document associated with each maintenance object.

If the switch is a simplex system, then the "Flash Data Consistency Test" is not executed.

Defaults

The defaults for this test command are "short" with a repeat number of "1". The location of carrier where the memory card resides must be specified in the command line for a High or Critical Reliability System.

Parameters

location	This parameter indicates the carrier location where the memory card resides in a High or Critical Reliability System (i.e. "a" or "b"). In a duplicated switch configuration, it can be either "a", "A", "b", or "B".
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test card-mem", the following message is displayed for a simplex switch configuration:

```
Enter ['long' or 'short'], ['repeat' (1-100)
          or 'clear'], ['schedule']
```

For a duplex switch configuration, the following message will be displayed:

```
Enter [cabinet(1)];carrier(A-B), ['long' or 'short'],
    ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the SPE is not active, the following message will be displayed:

```
Command must be executed from active SPE
```

If the carrier entered is invalid, the following message will be displayed:

```
"entered value" is an invalid identifier;
press RETURN to execute modified command
```

If the switch system is a 386 system [G3iV2-386, G3sV2, G3vsV2], and the NETCON board is not TN777B, then the following message will be displayed:

```
Must install TN777B circuit pack
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
    maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
   Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested. This object is always associated with cabinet 1. The carrier is "A" for the control carrier A in a simplex system, and it can be either "A" or "B" for the control carriers A and B in a duplex system. The slot and circuit fields of port address for the maintenance objects, 12V-PWR, CAP-MEM, and CARD-MEM, are always blank. The port address for maintenance object "FL-DATA" is blank.
Maintenance Name	The type of maintenance object that is being tested - "CARD-MEM" for the memory card; "12V-PWR" for 12 volt power supply in TN777B NETCON board; "CAP-MEM" for memory card capacity; and "FL-DATA" for the data consistency stored in memory cards in a duplicated switch.
Test No	The actual test that is being executed.
Result	An indicator such as PASS for test passed, FAIL for test failed, ABORT for test was aborted.
Error Code	A system-generated number that tells why the individual test failed or was aborted. A detailed list of the codes according to "Test No." is provided for each maintenance object.

For the following output example, the command "test card-mem" was entered.

```
test card-mem a long                                   SPE A


                  TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result      Error Code
  01A     12V-PWR                      701      PASS
  01A     CARD-MEM                     695      PASS
  01A     CARD-MEM                     696      PASS
  01A     CARD-MEM                     697      PASS
  01A     CARD-MEM                     698      PASS
  01A     CARD-MEM                     699      PASS
  01A     CARD-MEM                     694      PASS
  01A     CARD-MEM                     693      PASS
  01A     CAP-MEM                     1014      PASS
          FL-DATA                      421      PASS


Command successfully completed
```

FEATURE INTERACTIONS

The "test card-mem long" command will invoke the Memory Card Erase/Write/Read Test. This means that the "save translation" and "save announcement" commands will be rejected while a write-to-memory-card operation is active.

The "test card-mem long" command will also invoke the Memory Card Capacity Test which will check if the memory card is more than 98% full or not. This test will also be invoked after a "save translation" command.

In a High or Critical Reliability System, running "test card-mem" command for a memory card in the standby SPE means that the standby SPE is put into the maintenance mode and no SPE interchange is allowed through the "reset system interchange" command or scheduled SPE interchange.

test cdr-link

This command will perform a set of tests on a call detail recording (cdr)-link.

SYNOPSIS

test cdr-link [primary | secondary]*[short | long][repeat number | clear]* *schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test cdr-link primary l
test cdr-link secondary sh r 2
test cdr-link primary
test cdr-link secondary
test cdr-link secondary c
test cdr-link primary schedule

DESCRIPTION

The test cdr-link command will validate that the call detail recording (cdr)-link has been administered and exists in the PBX. Each individual test will exercise diagnostics on the link and then return results of the test along with any possible error codes.

For information on what a CDR link is and does, see the second paragraph in the "DESCRIPTION" section of the "status cdr-link" manual pages.

Defaults

The default for the command is short with the repeat of 1.

Parameters

link-id	A "Link-id" is either "primary" or "secondary".
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test cdr-link" the following message will be displayed:

```
Enter 'primary' or  'secondary'
```

If the system technician presses HELP after entering "test cdr-link primary" or "test cdr-link secondary" the following message will be displayed:

```
Enter ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the link is not administered, the following error message will be displayed:

```
Link not administered or not enabled
```

If no tests can be found for the link, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	Not applicable. Will always be blank.
Maintenance Name	The type of maintenance object that is being tested. If testing primary cdr-link the maintenance object will be PRI-CDR, else if testing secondary cdr-link the maintenance object will be SEC-CDR.
Alt. Name	Not applicable. Will always be blank.
Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS", "ABORT", "FAIL", "DISABLED".
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test cdr-link primary".

```
test cdr-link primary short

                         TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          PRI-CDR                     215      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test customer-alarm

This command allows the technician to test the leads for a customer-provided alarming device on the Processor and EPN maintenance circuit packs.

SYNOPSIS

test customer-alarm location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test customer-alarm
test customer-alarm schedule
test customer-alarm 02 r 2
test customer-alarm 01b r 25
test customer-alarm 01b r 25 schedule
test customer-alarm 2a
test customer-alarm 2a sh
test customer-alarm 01b l schedule
test customer-alarm 3 c

DESCRIPTION

The test customer-alarm command performs hardware diagnostic tests on the leads of the Processor and EPN maintenance circuit packs. These are used for customer provided alarms by closing the appropriate relay for one minute. Failure is verified by the technician checking the customer alarm attached to the circuit pack that was specified.

Defaults

The default cabinet is cabinet 1. The default carrier is carrier "a" except for SPE duplex system PPNs. In this case the carrier has no default and either "a" or "b" must be entered. The default for the remaining parameter is a repeat of 1.

Parameters

location	The location designates the physical position of the desired customer-alarm circuit pack. The location consists of a cabinet number and carrier letter. The cabinet number is one or two digits from 1 to 3 with leading zeros allowed. Cabinet 1 is the PPN with 2-3 referring to some optional EPN. The carrier is either "a" or "b" for cabinet 1 for SPE duplex systems. For SPE simplex systems, when selecting cabinet 1, the carrier must be "a" if entered. For cabinets 2-3, the carrier must be "a" if entered.
short	This will cause test number 115 to run.
long	This will cause test number 115 to run and is the same as the short sequence.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The clear option forces a clear of all alarms if no errors are encountered during testing.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test customer-alarm" on a simplex SPE system, the following message will be displayed:

```
Enter [cabinet(1-3)],['long' or 'short'],
['repeat'(1-100) or 'clear'], ['schedule']
```

If the system technician presses HELP after entering "test customer-alarm" on a duplex SPE system the following message will be displayed:

```
For cabinet 1 enter [cabinet(1)];
carrier (A-B),['long' or 'short'],
['repeat'(1-100) or 'clear'], ['schedule']
For cabinet 2-3 enter cabinet(2-3),['long' or 'short'],
['repeat'(1-100) or 'clear'], ['schedule']
```

Error Messages

If the location identifier entered is not valid, the following message will be displayed:

```
Command aborted; please try later
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

Port	The port address (cabinet-carrier-slot) of the maintenance object that is being reset.
Maintenance Name	The maintenance name will always be CUST-ALM.
Alt. Name	Not applicable.
Test No.	The test number will always be 115.
Result	The result of the individual test -"PASS," "ABORT," "FAIL."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered is "test customer-alarm 02a".

```
test customer-alarm 02A


                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  02A     CUST-ALM                    115      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test data-module

This command allows the technician to test a data module or a data channel.

SYNOPSIS

test data-module extension *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms.

EXAMPLES

test data-module 30000 l
test data-module 30000
test data-module 32000 sh r 2
test data-module 33000 l r 25
test data-module 33000 l r 25 schedule
test data-module 30000 c

DESCRIPTION

The test data-module command performs hardware diagnostic tests on a data module or a data channel. Test results are determined by the interface to the digital switch-data line port, digital line port, or network control data channel.

Defaults

The default for the command is short with the repeat of 1.

Parameters

extension	The extension associated with the data module or data channel to be tested. The number of digits in an extension is determined by a dial-plan.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

WARNING: Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test data-module" the following message will be displayed:

```
  Enter extension, ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the extension format is invalid, the following error message would be displayed:

```
Extension invalid
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a data module or a data channel, the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the EPN that contains the data module port is not accessible, the following message will be displayed:

```
EPN is not available
```

If the board that contains the data port is not configured in the system, the following message will be displayed:

```
Board not assigned
```

If no tests can be found for the current MO, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Test No	The actual test that is being executed.
Result	An indicator as to whether the test failed, passed, aborted or no hardware was available (no board).
Error Code	A numerical description of why the test failed or was aborted.

For the following output example, the command entered was "test data-module 300".

```
test data-module 300


                              TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C1103   PDMODULE                        17     PASS


Command successfully completed
```

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

test ds1-loop

test ds1-loop - For TN464F or TN767E or later suffix DS1 Interface circuit packs, this command is used for loopback and one-way span testing of the DS1 span.

SYNOPSIS

test ds1-loop location [cpe-loopback-jack-test-begin [number-of-bits bit-pattern] | far-csu-loopback-test-begin | one-way-span-test-begin | end-loopback/span-test | inject-single-bit-error | ds1/csu-loopback-tests]

PERMISSIONS

Logins with the following service levels may execute this command: system technician, inads, init, super-user, or logins with Maintain Switch Circuit Packs permissions enabled.

EXAMPLES

test ds1-loop 01c08
test ds1-loop 1-3c03 cpe-loopback-jack
test ds1-loop 1-3c03 cpe
test ds1-loop 10c03 end
test ds1-loop 02d12 fa
test ds1-loop 02d12 inj

DESCRIPTION

The test ds1-loop command will validate that the board exists at the specified location, that the board is a TN464F or TN767E or later suffix DS1 Interface board, and that the G3 Version of the switch software is V3 or later. Based on the command parameter, a long-duration loopback/span test or series of short-duration loopback tests will be executed.

Long-duration loopback tests execute for an extended period of time until the system technician terminates it. Short-duration loopback tests return the result of the test to the screen when finished executing. The "list measurements ds1 summary" command should be used to monitor the status of a long-duration loopback/span test.

Defaults

The default for the command is ds1/csu-loopback-tests.

Parameters

location	A "location" represents the physical position of the board to be tested. For G3V3 Standard cabinets a location is entered as "UUcSS" where "UU" represents the cabinet number, "c" represents the carrier, and "SS" represents the slot position. A single digit cabinet (1-3) may be entered with or without a leading zero (0).
cpe-loopback-jack-test-begin	For TN464F or TN767E or later suffix DS1 boards, this will cause a long-duration loopback test to be setup through the Customer Premises Equipment (CPE) Loopback Jack. The command allows the user to specify a loop-up code for the CPE loopback jack if it differs from the default of 0x47F. This loop-up code is entered by specifying the number of bits in the loop-up code as well as the actual bit-pattern (in hexadecimal). The test will abort if the board has not been taken out of service via the "busyout" command.
far-csu-loopback-test-begin	For TN464F or TN767E or later suffix DS1 boards, this will cause a long-duration loopback test to be setup through the far-end Channel Service Unit (CSU). The test will abort if the board has not been taken out of service via the "busyout" command.
one-way-span-test-begin	For TN464F or TN767E or later suffix DS1 boards, this will begin execution of a long-duration one-way span test. The test will abort if the board has not been taken out of service via the "busyout" command.
end-loopback/span-test	For TN464F or TN767E or later suffix DS1 boards, this parameter terminates long-duration one-way span and loopback testing.
inject-single-bit-error	For TN464F or TN767E or later suffix DS1 boards, this parameter causes a single bit error to be sent within an active framed 3-in-24 test pattern used in long-duration loopback and span testing.
ds1/csu-loopback-tests	For TN464F or TN767E or later suffix DS1 boards, this parameter will execute the following loopback tests: DS1 Board LoopBack, CSU Module Equipment LoopBack, and CSU Module Repeater LoopBack. These tests are performed sequentially for a short duration each, and individual PASS/FAIL/ABORT test results are reported following each test.

Help Messages

If the system technician presses HELP after entering "test ds1-loop" the following message will be displayed:

```
Enter DS1 board location,
['cpe-loopback-jack-test-begin [number-of-bits bit-pattern]' or
'far-csu-loopback-test-begin' or 'one-way-span-test-begin' or
'end-loopback/span-test' or 'inject-single-bit-error' or
'ds1/csu-loopback-tests']
```

Error Messages

If the format for the board location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN in which the specified board resides is not available, the following message will be displayed:

```
EPN is not available
```

If the specified board is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

If the "test ds1-loop" command is executed and the "G3 Version" field on the "system-parameters customer-options" form is not V3 or later, then the following message will be displayed:

```
G3 Version must be V3 or later
```

If the "test ds1-loop" command is executed on a circuit pack other than TN464F or TN767E or later DS1 board, then the following message will be displayed:

```
Command valid for TN464F or TN767E or
later release DS1 circuit packs
```

If the "inject-single-bit-error" parameter is selected, but no CPE Loopback Jack, far-end CSU, or one-way span test is active on the DS1 circuit pack, then the following message will be displayed:

```
Parameter valid only if a loopback/span test is active on the DS1
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object.
Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD".
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the board in cabinet 1, carrier c, slot 7 is a TN767E DS1 board. The command that was entered was "test ds1-loop 1c07."

```
test ds1-loop 01C07 ds1/csu-loopback-tests


                                TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C07     DS1-BD                      1209     PASS
  01C07     DS1-BD                      1210     PASS
  01C07     DS1-BD                      1211     PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Loopback or span tests will not be allowed on DS1 boards unless the board has been busied out.

Only one of the CPE Loopback Jack, far-end CSU, one-way span, or DS1/CSU loopback tests may be active at any given time on a DS1 span.

test duplication-interface

This command will test the indicated duplication-interface board.

SYNOPSIS

test duplication-interface location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test duplication-interface a
test duplication-interface b sh
test duplication-interface a l r 25
test duplication-interface 1b l r 25 schedule
test duplication-interface 1a l c

DESCRIPTION

The test duplication-interface command performs hardware diagnostic tests on the indicated duplication interface circuit pack. Testing is under control of the active SPE. The SHDW-CIR, SPE-SELECT and DUPINT maintenance objects are tested using this command. The SHDW-CIR maintenance object is associated with that portion of the duplication interface circuit pack that handles memory shadowing from the active to the standby SPE. The SPE-SELECT maintenance objects is associated with the SPE Select switch located on the front of the circuit pack. The DUPINT maintenance object is associated with the duplication interface circuit packs other functions which include SPE to SPE communication, SAT connection and environmental maintenance leads.

Defaults

Defaults for the parameters are short with a repeat of 1.

Parameters

location	The location designates the SPE location of the desired duplication interface circuit pack; either "1a", "1b" "a" or "b".
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. The long version includes a destructive test for this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test duplication-interface," the following message is displayed:

```
Enter [network(1);carrier(A-B) ['long' or 'short'],
     ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

For any system, if a user entered parameter is not among those listed in the "Parameters" section, the following message is displayed:

```
Entry invalid
```

If an invalid port network is specified, the following message is displayed:

```
Invalid port-network specified
```

If an invalid carrier is specified, the following message is displayed:

```
Invalid carrier specified
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) will always be 01A or 01B.
Maintenance Name	The maintenance name will always be SHDW-CIR, SPE-SELE, or DUPINT.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test duplication-interface 1A" while "A" was the active carrier in an SPE duplex system.

```
test duplication-interface a long                      SPE A


                                TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result      Error Code
  1A      SHDW-CIR                    285      PASS
  1A      SHDW-CIR                    283      PASS
  1A      SHDW-CIR                    284      PASS
  1A      SPE-SELE                    278      PASS
  1A      DUPINT                      315      PASS
  1A      DUPINT                      275      PASS
  1A      DUPINT                      276      PASS
  1A      DUPINT                      280      PASS
  1A      DUPINT                      271      PASS
  1A      DUPINT                      277      PASS
  1A      DUPINT                      272      PASS
  1A      DUPINT                      274      PASS
  1A      DUPINT                      273      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Failures of the duplication-interface may prevent SPE switching.

Test EDA-External-Device-Alrm

test eda-external-device-alrm all | physical location [repeat number | clear][schedule]

This test will perform hardware diagnostic tests on an individual external-device-alarm port or on all external-device-alarm ports.

The **test eda-external-device-alrm** command performs a hardware diagnostic test on all administered external device alarms if all is entered. If an administered external device alarm port is entered, the test external-device-alarm command performs a hardware diagnostic test on that port. The test PASSES if the external device is not reporting an external device alarm and FAILS if the external device is reporting an external device alarm. If the technician specifies the port it must be administered as an external device alarm port on a maintenance board or on an analog line port carrier board.

Defaults

The default for this command is a repeat of 1.

Parameters

physical location	In addition to entering the word "physical" the system technician must specify the physical location. For an administered external device alarm analog line port, a "physical location" represents the physical position of the port to be tested and is entered as "**UUcSSpp**" where "**UU**" represents the cabinet number (1-MAX_CABS), "**c**" represents the carrier, "**SS**" represents the slot position, and "**pp**" represents the circuit. Since the "maintenance board" alarm connections connect to control carrier boards that are in unnumbered slots, the standard port format cannot be used to designate these alarm connections. The special ports **UUmajor** and **UUminor** are used designate the major or minor maintenance board alarm connection for cabinet **UU**. **NOTE:** The major/minor designation specifies the pair of wires, not the alarm level associated with the connection (*i.e.* the "major" port can be administered as a major, minor or warning alarm and the "minor" port can be administered as a major, minor or warning alarm). The "all" location is used to test all administered external device alarm ports on analog line boards and maintenance boards.
repeat number	The "number" specifies how many times the “test physical location” is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specifications [1] for more details.

Examples

test eda-external-device-alrm all
test eda-external-device-alrm all schedule
test eda-external-device-alrm physical 1major r 10
test eda-external-device-alrm physical 2c1101 c

Output

For the following output example the command that was entered was "**test external-device-alarm all**":

```
test eda-external-device-alrm all

                             TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result           Error Code

  03major   EXT-DEV            CMS1      120      PASS
  03A2102   EXT_DEV            CMS2      120      FAIL
  01major   EXT-DEV            UPS1      120      PASS
  01minor   EXT-DEV            UPS1      120      PASS
  01c1201   EXT-DEV            UPS1      120      PASS
  03A2101   EXT_DEV            CC temp   120      PASS
  01c1202   EXT-DEV            Audix1    120      PASS
  03minor   EXT-DEV            Audix2    120      FAIL
  04major   EXT-DEV            unknown   120      FAIL









Command successfully completed
```

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Field definitions:

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This is an administered more descriptive name of the external device alarm
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS", "ABORT", "FAIL", "NO BOARD", "DISABLED", "EXTRA BD".
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

test environment

This command will test the environment monitoring and control capabilities including emergency transfer in any cabinet.

SYNOPSIS

test environment location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test environment
test environment schedule
test environment 1 sh
test environment 1 l r 25
test environment 01 l r 25
test environment 01 l r 25 schedule
test environment 2 l c
test environment 3 c

DESCRIPTION

The test environment command performs hardware diagnostic tests of the environment monitoring and control, and emergency transfer functions of a technician specified cabinet. This command will test both Processor Port Network (PPN) cabinets and Expansion Port Network (EPN) cabinets. Circuit packs involved are the Processor circuit pack (PPN simplex systems), the Duplication Interface circuit pack (PPN duplex systems) and EPN Maintenance circuit packs. The tone/clock circuit pack is involved in tests of the ring generator.

There are 8 Maintenance Objects involved in this testing. DC-POWER tests power availability, battery charging and temperature functions in SCC cabinets only. EMG-XFER tests emergency transfer status, and EXT-DEV tests external (i.e. AUDIX) alarm status for both the SCC and MCC cabinet systems. POWER tests battery backup, AC-POWER tests AC power availability, CARR_POW tests carrier DC power availability, CABINET tests air flow and temperature, RING_GEN tests ringing voltage are tested in MCC cabinets only.

Note that the long test of CARR_POW includes a power recycle test for non-Processor Element (SPE) carriers and is destructive. There is one instance of CARR_POW for each carrier in the cabinet.

NOTE:
The processor carrier and its duplicate if present as well as any EPN control carrier or an SCC carrier will not be recycled. All port carriers are recycled, and service is interrupted for each port carrier. If a carrier containing an active EI is recycled, communications with that cabinet will be disrupted. If a carrier containing an active tone-clock board is recycled, all ports in the cabinet or port network will have service disrupted.

Defaults

The default cabinet is cabinet 1. Defaults for the remaining parameters are short with a repeat of 1.

Parameters

location	The location the cabinet number. The cabinet number is one or two digits from 1 to 3 with leading zeros allowed. Cabinet 1 is the PPN with 2-3 referring to some optional EPN.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This includes both destructive and nondestructive tests for this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test environment," the following message will be displayed:

```
Enter [cabinet(1-3)],['long' or 'short'],
['repeat'(1-100) or 'clear'],['schedule']
```

Error Messages

If the entered cabinet location is greater than two characters or otherwise invalid, the following error message is displayed:

```
Identifier invalid
```

If the indicated EPN is not available, the following message is displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message is displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) of the maintenance object that is being tested. For all but the CARR-POW maintenance object, only the cabinet value is displayed. For the CARR-POW maintenance object, both the cabinet and carrier values are displayed.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "DISABLED."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test environment 1" to test a MCCPPN cabinet.

```
test environment 1


                            TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  01      POWER                           5      PASS
  01      AC-POWER                       79      PASS
  01A     CARR-POW                      127      PASS
  01B     CARR-POW                      127      PASS
  01C     CARR-POW                      127      PASS
  01D     CARR-POW                      127      PASS
  01E     CARR-POW                      127      PASS
  01      EMG-XFER                      124      PASS
  01      CABINET                       122      PASS
  01      EXT-DEV                       120      PASS
  01      RING-GEN                      118      PASS


Command Successfully Completed
```

For the following output example, assume that the command that was entered was "test environment 2" where cabinet 2 is an SCC cabinet.

```
test environment 2


                             TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  02      DC-POWER                       5      PASS
  02      EMG-XFER                     124      PASS
  02      EXT-DEV                      120      PASS
  02      RING-GEN                     117      PASS
  02      RING-GEN                     118      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

The long test will recycle power in some specified cabinet on non-SPE and maintenance board carriers and is destructive. Specifically, the 'a' carrier of PPNs and EPNs does not have power recycled. In PPNs containing duplicated SPEs the 'b' carrier also does not have power recycled.

All port carriers are recycled, and service is interrupted for each port carrier. If a carrier containing an active EI is recycled, communications with that cabinet will be disrupted. If a carrier containing an active tone-clock board is recycled, all ports in the cabinet or port network will have service disrupted.

test hardware-group

This command allows a user to perform a set of hardware diagnostic tests on the whole system, a carrier, cabinet, spe, or board. The tests will vary according to the configuration of the system and the specified command options.

SYNOPSIS

test hardware-group [system | carrier carrier location |

cabinet cabinet location | board board location | spe]

[print | schedule]

PERMISSIONS

The following logins may execute this command: inads, init.

EXAMPLES

test hardware-group system
test hardware-group system print
test hardware-group carrier 1a
test hardware-group carrier 1a schedule
test hardware-group cabinet 2
test hardware-group board 01c07
test hardware-group board 01c07 schedule
test hardware-group spe
test hardware-group spe print
test hardware-group spe schedule

DESCRIPTION

The "test hardware-group" command will run a series of tests on all the hardware on the entire system, an individual carrier, cabinet, spe, or board. The tests will vary depending on options chosen and board types. Each individual test will exercise diagnostics on all the hardware in the specified hardware group and return results of the test along with any possible error codes. Concurrent testing is done to enhance performance, therefore, test results are displayed on the SAT in the order they are received. Consequently, test results of one maintenance object may be intermixed with test results of other maintenance objects.

Because the tests in the "test hardware-group" command are not destructive, the tests performed on a particular maintenance object with either the 'short' or the 'long' option of the "test hardware-group" command may not be the same as the corresponding demand tests.

A hardware-group command executing in the foreground may be aborted by either pressing the ’cancel’ key on the SAT or by entering the "cancel hardware-group" command on a different SAT.

However, if the system technician wishes to cancel a "test hardware-group" command running in the background the "cancel hardware-group" command needs to be entered on any SAT.

A canceled "test hardware-group" command can be resumed at the point it left off by entering the "resume hardware-group" command on the SAT. Restarts are not allowed for "test hardware-group" commands entered with either the "all-ports" option or the "spe-interchange" option.

Defaults

The default for the command is short with a repeat of 1.

Parameters

carrier location	A ’carrier location’ represents the carrier to be tested and is entered as UUC format where ’UU’ is a valid cabinet number (1-3) and the ’C’ represents any value between A-E. The type of carrier may be port, or processor. In the case of a port carrier, all universal port and tone-clock boards (see reference 4) and its affiliated MOs residing in the specified carrier are tested. For a processor carrier, all SPE complex and tone-clock boards and its affiliated MOs are tested.
cabinet location	A ’cabinet location’ represents the cabinet to be tested. It can be any value between 1-3. All PN and PNC related MOs plus cabinet specific MOs, including maintenance boards and environment (ring generator, battery, power, emergency transfer, external alarms, fans, and temperature) will be tested if they reside in the specified ’cabinet location’.

board location	A 'board location' represents the physical location of the board and is entered as 'UUCSS' format, where 'UU' is a valid cabinet number (1-3), 'C' is a carrier number between A-E, and 'SS' is the slot position. All MOs on the specified 'board location' including ports will be tested.
print	This will cause the report to be printed if a printer is linked to the SAT.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [5] for more details.

Help Messages

If the system technician presses HELP after entering "test hardware-group" the following message will be displayed:

```
board  cabinet  carrier  spe  system
```

If the system technician presses HELP after entering "test hardware-group board" the following message will be displayed:

```
Enter board location: [cabinet (1-3);
     carrier (A-E);slot(00-20)]
```

If the system technician presses HELP after entering "test hardware-group cabinet" the following message will be displayed:

```
Enter cabinet (1-3)
```

If the system technician presses HELP after entering "test hardware-group carrier" the following message will be displayed:

```
Enter carrier location:
['cabinet'(1-3)]; carrier (A-E)
```

If the system technician presses HELP after entering "test hardware-group system" the following message will be displayed:

```
Entry is not required
```

If the system technician presses HELP after entering "test hardware-group spe" the following message will be displayed:

```
Entry is not required
```

Error Messages

If there is another "test hardware-group" active the following message will be displayed:

```
Command aborted - another hardware-group
        test already in progress
```

If an "add station" command is entered for a non-customer translated port at the same time as it is being tested because of the "test hardware-group" command with the ’all-ports’ option the request to "add station" will fail and the following message will be displayed:

```
Object in use; please try later
```

If an invalid physical location is specified with the "test hardware-group board" command the following message will be displayed:

```
Board invalid
```

If an unassigned board is specified with the "test hardware-group board" command the following message will be displayed:

```
Board not assigned
```

If an invalid carrier is specified with the "test hardware-group carrier" command the following message will be displayed:

```
Invalid carrier specified
```

If an invalid cabinet is specified with the "test hardware-group cabinet" command the following message will be displayed:

```
Invalid cabinet specified
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

FORM INPUT

Once the user has entered the desired action (test hardware-group) and the object (board, carrier, etc.), then the user is presented with an options form.

Test sequence	This allows the user to specify whether the short (nondestructive) or the long (more comprehensive and still nondestructive) test sequence should be exercised.
Test Repetition	This allows the user to enter either ’repeat’ with a corresponding repeat value (between 1 and 99) or ’continuously’. The repeat option will cause each test to be executed the number of times specified on each physical object. The continuously option, on the other hand, will cause all tests on all the hardware specified to be executed until the CANCEL key is hit or the ’cancel hardware-group’ command is run.
count:	This field allows the technician to enter a repeat value between 1 and 99. If the ’test sequence’ field is set to continuously, then this field is removed from the screen. When the ’test sequence’ field is set to repeat, then this field is added to the screen.
Auto-page?	This option provides the ability to continue testing and display of test results by providing a new screen every time the SAT screen is filled with test results. The screen does not scroll to accommodate new results; instead a new screen is provided after the current screen fills up. This option is not allowed if the ’background’ option has been chosen. If the ’auto-page’ option is not specified, the SAT screen will not be refreshed once it is filled with test results and testing will stop until the user enters the ’page’ key to continue or ’cancel’ key to halt the testing.

Background? This option provides the ability to run the command in the background thus freeing up the SAT. The error results will be tabulated in the error log but no results will be displayed on the terminal.

This option may not be used if the ’continuously’ option or the ’auto-page’ option is specified.

Failures? This option will select only failing test results to be displayed on the test results screen. Test results which pass or abort are not displayed. The ’failures’ option has no effect if entered with the ’background’ option.

All-ports? The ’all-ports’ option will allow testing of all customer translated line and trunk ports and also a set of line and trunk ports without customer translations. Untranslated ports for the following board types will be tested:

Table 10-7. Test of ‘all ports’ option for the following boards:

Board Number	Description
TN413	Digital Line
TN417	Auxiliary Trunk
TN429	Direct Inward/Outward Dialing Trunk
TN436	Direct Inward Dialing Trunk
TN437	Tie Trunk
TN438	Central Office Trunk
TN439	Tie Trunk
TN447	Central Office Trunk
TN458	Tie Trunk
TN459	Direct Inward Dialing Trunk
TN464C	Universal DS1
TN465	Central Office Trunk
TN467	8 port Analog line
TN468	16 port Analog line
TN479	16 port Analog line

Continued on next page

Table 10-7. Test of 'all ports' option for the following boards: — *Continued*

Board Number	Description
TN497	Tie Trunk
TN556	ISDNBRI Line
TN722B	DS1 Tie Trunk
TN726B	Data Line
TN735	MET Line
TN742	8 port Analog Line
TN746	16 port Analog Line
TN747B	Central Office Trunk
TN753	Direct-Inward-Dial Trunk
TN754	Digital Line
TN760C	Tie Trunk
TN762B	Hybrid Line
TN763C	Auxiliary Trunk
TN767	DS1 Interface
TN769	Analog Line with Message Waiting
TN784	Digital Line
TN785	16 port Analog Line
TN2135	Italian 16 Port Analog Line
TN2136	Digital Line
TN2138	International Central Office Trunk
TN2139	Direct Inward Dialing Trunk
TN2140	Tie Trunk
TN2144	Analog Line
TN2146	Direct Inward Dialing Trunk
TN2147	Central Office Trunk
TN2149	Analog Line
TN2180	16 port Analog line

SPE-interchange?	The 'spe-interchange' option will allow for the planned interchange of duplicated SPEs and subsequent testing of both the active and standby SPEs.

```
test hardware-group system                       Page 1 of 1


           TEST HARDWARE-GROUP SELECTIONS

      Select the desired options for the specified test.
            Test sequence: short
          Test repetition: repeat          count: 1


       OUTPUT OPTIONS:                HARDWARE OPTIONS:
        Auto-page? n               All-ports? n
       Background? n         SPE-interchange? n
         Failures? n
```

Field Help

Following are the help message that the system technician will see upon tabbing to the specified field and pressing the HELP key.

Test sequence	Enter short or long
Test Repetition	Enter repeat or continuously
count:	Enter repeat number between 1-99
Auto-page?	n(o) y(es)
Background?	n(o) y(es)
Failures?	n(o) y(es)
All-ports?	n(o) y(es)
SPE-interchange?	n(o) y(es)

Field Error Message

Following are the error message that will be displayed on the screen. The message are displayed when the system technician tabs out of a field and the validation routines are executed. In the following messages, an "x" represents what was entered by the user.

Test sequence	"x" is an invalid entry, please press HELP
Test Repetition	"x" is an invalid entry, please press HELP
	"x" The background option cannot be chosen with continuous testing
count:	Entry must be all digits
	Entry out of range
Auto-page?	"x" is an invalid entry, please press HELP
	"x" The auto-page and background options may not both be activated
Background?	"x" is an invalid entry, please press HELP
	"x" The background option cannot be chosen with continuous testing
	"x" The auto-page and background options may not both be activated
Failures?	"x" is an invalid entry, please press HELP
All-ports?	"x" is an invalid entry, please press HELP
SPE-interchange?	"x" is an invalid entry, please press HELP

OUTPUT

If the ’background’ option was chosen then the following message is displayed:

```
Command started in background mode
```

Progress information will be displayed on the SAT screen for a "test hardware-group" command run in the foreground. While testing is in progress, a running count of MOs tested, the total number of MOs to be tested, and the current pass number will be displayed on the screen ().

If the all-ports option is entered the following message will be displayed before testing has begun:

```
Preparing unadministered ports for testing
```

If the "failures" option was selected and no tests fail the following message will be displayed:

```
No failing test results available
```

If no tests are available for the MOs in the specified hardware group the following message is displayed:

```
No tests available for MOs in the
    specified hardware group
```

If the spe-interchange option was selected and the command was run from a non-PPNSAT the following message is displayed while the interchange takes place:

```
SPE interchange in progress, please wait
```

If the spe-interchange option was selected and the command was run from the PPNSAT, the interchange will be the last operation to run and then the SAT will be logged off as part of the interchange.

If an interchange cannot be performed the following message is displayed:

```
Cannot perform SPE interchange,
for information use ’status spe’
```

The responses to a "test hardware-group" command run in the foreground will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that has been tested.
Maintenance Name	The type of maintenance object that has been tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.

Test No.	The actual test that has been executed.
Result	An indicator as to whether the test failed, passed or was aborted. Sometimes a maintenance object cannot be tested and one of the following test results will be displayed: NO BOARD The board is administered but not inserted. EXTRA BD The wrong type of board is inserted in this slot. DISABLED This maintenance object has been disabled, either through a demand maintenance command ("disable MO") or by an internal maintenance action. SKIPPED This maintenance object is busy with other maintenance activity. Hardware-group maintenance will **not** preempt other types of testing, not even background maintenance.
Error Code	A numerical description of why the test failed or was aborted.

For the following output example, assume that the board in port network 1, carrier c, slot 7 is an analog board with three ports administered. The command that was entered was "test hardware-group system" and a repeat with count of 3 was chosen.

```
test hardware-group system


                                TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C07     ANL-BD                      51       PASS
  01C07     ANL-BD                      52       PASS
  01C0703   ANL-LINE                    35       PASS
  01C0702   ANL-LINE                    35       PASS
  01C0703   ANL-LINE                    48       PASS
  01C0701   ANL-LINE                    35       PASS
  01C0702   ANL-LINE                    48       PASS
  01C0703   ANL-LINE                    36       PASS
  01C0702   ANL-LINE                    36       PASS
  01C0701   ANL-LINE                    48       PASS
  01C0701   ANL-LINE                    36       PASS

Testing system, 11070 of 12300 (90%) MOs tested for repetition 1
```

For the following output example, the command that was entered was "test hardware-group system" and the background option was chosen.

```
test hardware-group system

Command started in background mode
```

FEATURE INTERACTIONS

Test hardware-group

Only one "test hardware-group" command can be active at any given time.

TTI

If the "test hardware-group" command is issued with the ’all-ports’ option when the TTI background task is active, some unadministered ports may not be tested. In addition, active alarms on line ports may be cleared by this task. The "status tti" command may be used to determine the state of the TTI background task.

Add Station

If a "add station" command is entered for an untranslated port at the same time as it is being tested because of the "test hardware-group" command with the ’all-ports’ option, the request to "add station" will fail and the following message will be displayed:

```
Object in use; please try later
```

Trunk Administration

If an attempt is made to add an unadministered trunk port to a trunk group at the same time as it is being tested because of the "test hardware-group" command with the ’all-ports’ option, the request will fail and the following message will be displayed:

```
Object in use; please try later
```

Save Translation

If the "test hardware-group" command is issued with the ’all-ports’ option when a translation save operation is active, some unadministered ports may not be tested. All other hardware will be tested normally.

Hardware Alarms

When a hardware error is detected by the "test hardware-group" command the hardware goes through the standard escalation strategy. Alarms will be raised on hardware that manifest 'hard' errors. This alarming strategy is the same, regardless of whether the ports are translated or not.

System Interaction

The performance of "test hardware-group" is affected by call processing traffic, administration activity, choice of the 'short' or 'long' option, whether the 'all-ports' option was chosen, whether the 'spe-interchange' option was chosen, and other demand maintenance activity.

Scheduled and Periodic maintenance

When a "test hardware-group" command is entered, all activity related to scheduled background maintenance, periodic background maintenance, and data audits is suspended for the duration of the execution of the "test hardware-group" command. When a "test hardware-group" command is canceled or when the "test hardware-group" command completes, all suspended periodic, scheduled, and data audits background maintenance activity will be restarted where it left off.

test inads-link

This command will perform hardware diagnostic tests from the inads port that is accessible through the maintenance board to an OSS telephone number.

SYNOPSIS

test inads-link [1 | 2]

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test inads-link
test inads-link 1
test inads-link 2

DESCRIPTION

The test inads-link command attempts to make a call over the inads port on the maintenance board to verify the INADS alarm notification process. By default, the link to the first OSS telephone number is tested. If there is an alarm pending to be reported or the call is in progress or up, then the test will be aborted. If the alarm origination to the OSS telephone number to be tested is disabled, the test generates an informative error and the test continues. The test will wait 2 minutes before executing to allow the remote maintenance technician to logoff freeing the line. The line must be free so the system can place a call to INADS. A local SAT user entering the "test inads-link" command need not log off for the system to place a call to INADS, but the two minute delay still exists.

Once the call is answered by INADS, the system will send a message with a test alarm type. INADS acknowledges receipt of the message and creates a trouble ticket. The trouble ticket will be closed immediately and have a "INADS LINK TEST" message entered in the description field. If an alarm is raised while the test call is up, the system will not send an alarm message over the existing link. The normal retry mechanism will be followed, which means an attempt to make a call to INADS to report the error will take place seven (7) minutes later. An INADS trouble ticket will be created only if the connection is successfully established, and a message is sent to the system acknowledging that INADS received the system message.

The "Maintain Process Circuit Packs" field must be set to yes on the inads and technician permission forms. This will provide permissions to execute the "test inads-link" command. The field can be changed by executing a "change permission login" command.

There will be no alarms raised on the system as a result of the "test inads-link" command. Attendant alarm and acknowledgment lamp states will not be changed as a result of the command. The test will not be run during periodic or scheduled maintenance.

Defaults

The test will default to test the link to the first OSS telephone number.

Parameter

1	This option will cause testing of the link to the first OSS telephone number.
2	This option will cause testing of the link to the second OSS telephone number.

Help Messages

If the system technician presses HELP after entering "test inads-link" the following message will be displayed:

['1' or '2']

Or press CANCEL to cancel the command

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

If the test passed then the following message will be displayed:

```
Command successfully completed
```

If the test failed, because the link was up or because there was an active alarm that the switch needs to report or there was a problem with the call, the following message will be displayed:

```
Command failed
```

NOTE: An entry is made in the error log describing why the inads-link test failed.

SYSTEM 85 R3 AND SYSTEM 75 R1 RELEASE DIFFERENCES

None.

FEATURE INTERACTIONS

None.

test interface

This command will test a processor interface board.

SYNOPSIS

test interface location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test interface 01a1 l
test interface 01b2 s r 2
test interface 01b2 s r 2 schedule
test interface b1 l r 25
test interface a2

DESCRIPTION

The test interface command performs hardware diagnostic tests on the technician specified processor interface circuit pack. In addition to testing the PI board, the tests will examine the protocol and link interface that is transmitted over the board.

Defaults

The default for the command is short with the repeat of 1.

Parameters

location	The location (cabinet-carrier-position) of the processor interface. The position determines which processor interface circuit pack will be cleared. A position of 1 is the first processor interface in the carrier, while a position of 2 is the second processor interface in the carrier.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.

repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence

WARNING:
Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test interface" the following message will be displayed:

```
Enter [cabinet(1)];carrier(A-B), pos(1-2),
  ['long' or 'short'], ['repeat' (1-100)
        or 'clear'], ['schedule']
```

Error Messages

If the specified carrier is not the active PE, the following message will be displayed:

```
Command must be executed from active SPE
```

If the technician-entered cabinet and carrier is invalid for a PPN, the following message will be displayed:

```
Invalid port-network specified
```

If the technician-entered carrier is not a valid carrier, the following message will be displayed:

```
Invalid carrier specified
```

If the technician-entered carrier is not active, the following error message will be entered:

```
Board invalid
```

If the specified carrier/position processor interface circuit pack is not inserted, but the specified carrier is active, the following error message will be displayed:

```
No such MO's lname/pname
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot) of the maintenance object that is being tested. With this particular maintenance object, the port address represents the carrier associated with the particular processor interface board.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test interface a1".

```
test interface a1


                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result      Error Code
  01A1    PI-SCI                      231      PASS
  01A1    PI-BD                       52       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test isdn-testcall

This command starts an outgoing ISDN-PRI test call.

SYNOPSIS

test isdn-testcall group number*/member number minutes minute number schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test isdn-testcall 80/1
test isdn-testcall 80/1 schedule
test isdn-testcall 78/2 minutes 10
test isdn-testcall 78/3 minutes 100 schedule

DESCRIPTION

The test isdn-testcall command starts an outgoing ISDN-PRI test call in the asynchronous method. The trunk to originate the ISDN-PRI test call from is specified. If the test results are "PASS" the test call is started. A test result of "ABORT" means that a resource wasn't available (i.e. B-channel, Maintenance/Test circuit pack). A test result of "FAIL" denotes that the outgoing ISDN-PRI test call was not established.

Defaults

The duration of the test call defaults to 8.4 or 9.6 seconds.

Parameters

group number	The group number is an administered number associated with each trunk group.
member number	The member number is an administered number identifying a particular trunk within a trunk group.
minute number	The duration of the test call specified in minutes (1-120).
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test isdn-testcall" the following message will be displayed:

```
Enter group #/member # ['minutes' (1-120)],
                ['schedule']
```

Error Messages

If the specified format of the trunk location is incorrect, the following message is displayed:

```
Format invalid
```

If the specified trunk group or member range is invalid, the following message is displayed:

```
Trunk or trunk group invalid
```

If a trunk group and member is not specified, the following message is displayed:

```
Must specify group/member pair
```

If the specified trunk group is not administered or has no members administered, the following message is displayed:

```
Group not assigned, or group assigned
         but with no member
```

If the specified trunk group member is not administered, the following message is displayed:

```
Group member not assigned
```

If the specified trunk is not an ISDN-PRI trunk, the following message is displayed:

```
Invalid non ISDN-PRI trunk specified
```

If no tests can be found for the associated MO, the following message is displayed:

```
No tests for this MO
```

If an ISDN-PRI test call has already been started, the following message is displayed:

```
There is a test call already in progress
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can’t complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the trunk object xxx/yyy, where xxx is the trunk group number and yyy is the member number.

Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO [for example, see "ISDN-TRK (DS1 ISDN Trunk)" section error code description Test Number 258].

For the following output example the command entered was "test isdn-testcall 80/1".

```
test isdn-testcall 77/1                             SPE A


                        TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01B1501   ISDN-TRK          077/001   258      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Additional data is available after running the test. See the status isdn-testcall command for details on how to access the additional data.

Only one ISDN trunk can be tested per port network at a time. Once testing is completed, another ISDN trunk can be tested in that port network.

The maximum number of asynchronous outgoing test calls running, depends on the number of Maintenance/Test circuit packs in the system.

test journal-printer

This command will perform tests on the journal printer links.

SYNOPSIS

test journal-printer [pms-log | wakeup-log] *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test journal-printer pms-log l
test journal-printer pms-log l schedule
test journal-printer wakeup-log r 2
test journal-printer wakeup-log r 2 schedule
test journ pm r 3
test journ pm r 3 schedule

DESCRIPTION

The test journal-printer command will perform hardware diagnostics on the link between the switch and one of the technician specified journal printer links. There are two types of journal printer links (pms-log wakeup-log).

For general information on journal printer links, see the second paragraph in the "DESCRIPTION" section of the "busyout pms-link" manual pages.

For information on what a journal printer is and does, see the second paragraph in the "DESCRIPTION" section of the "status journal-link" manual pages.

Defaults

The default for the command is short with the repeat of 1.

Parameters

pms-log	This will test the link to the pms logging printer. The maintenance name for the pms-log printer, displayed on the test results form on output, is PMS-PRNT.
wakeup-log	This will test the link to the wakeup logging printer. The maintenance name for the wakeup-log printer, displayed on the test results form on output, is JNL-PRNT.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test journal-printer", the following object command word choices will be displayed:

```
pms-log    wakeup-log
```

Error Messages

If the link is not administered, the following error message will be displayed:

```
Link not administered or not enabled
```

If no tests can be found for the link, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	Not applicable. Will always be blank.
Maintenance Name	The type of maintenance object that is being tested. If testing the pms-log printer link the maintenance name will be PMS-PRNT, else if testing the wakeup-log printer link the maintenance name will be JNL-PRNT.
Alt. Name	Not applicable. Will always be blank.
Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS", "ABORT", "FAIL", "DISABLED".
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test journal-printer pms-log".

```
test journal-printer pms-log short


                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          JRNL-LINK                   215      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recovery of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

test led

This command will perform a test on all the LEDs in a specified cabinet. The test consists of turning all the LEDs on all circuit packs on and then off.

SYNOPSIS

test led *[all | cabinet number] [short | long] repeat number*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test led
test led all r 2
test led cabinet 1
test led c 1
test led 1 long

DESCRIPTION

The test led command will validate that the specified cabinet exists. Once the range of circuit packs is determined, the test LED command will turn on all LEDs on the circuit packs contained in each carrier until all affected carriers are lit. Once all the LEDs are on there will be a 2 second pause and then all the LEDs will be turned off in the same order as they were lit. Once all of the repeat cycles are completed, all affected LEDs will be restored to the current status.

On a duplex PPN, only the long option will test the leds in the standby SPE. When executing the test led long command, the standby Processor, Memory and Packet Control circuit pack LEDs can take up to 20 seconds to light.

The following LEDs are NOT lighted by the test led command:

- SPE Select LEDs on the Duplication Interface Circuit Packs.
- Power Unit LEDs.
- The yellow (amber) LED on the tape drive.

Defaults

The default for the command is "all" with a repeat of 1 and short in a duplex system.

Parameters

all	All LEDs in all carriers will be tested.
cabinet number	The number of the cabinet that will be tested. Each carrier in the cabinet will complete testing before the next carrier is started.
short	In a simplex system the short and long option are identical and will turn on and off all leds in the specified port network. In a duplex system, the short option will NOT affect the leds in the standby SPE carrier in the PPN.
long	In a simplex system the short and long option are identical and will turn on and off all leds in the specified port network. In a duplex system, the long option will affect the leds in the standby SPE carrier in the PPN.
repeat number	The "number" specifies how many times each test is repeated. "Number" may be any integer between 1 and 100.

Help Messages

If the system technician presses HELP after entering "test led" the following message will be displayed:

```
Enter ['all' or 'cabinet' (1-3)],
['long' or 'short' ], ['repeat' (1-100)]
```

Error Messages

If there is an error in the input to the command, where "x" is the invalid input, the following message will be displayed:

```
"x" is an invalid identifier;
press RETURN to execute modified command
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

If the command is successful, the following message will be displayed:

```
Command successfully completed
```

FEATURE INTERACTIONS

None.

test link

This command will perform a set of hardware diagnostic tests on the specified link.

SYNOPSIS

test link link-id *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test link 1
test link 1 schedule
test link 3 l
test link 2 sh
test link 2 r 2
test link 2 l c

DESCRIPTION

The test link command will validate that the link specified is administered. Then the tests for a link will be executed on the specified link. The results of the test along with any possible error codes are displayed.

Defaults

The default for the command is short with the repeat of 1.

Parameters

link-id	A link number between 1-8 that identifies the link to be tested. The link number is assigned via the communication-interface links form.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.

repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test link" the following message will be displayed:

```
Enter link number(1-8), ['long' or 'short'],
  ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the link number is not within the valid range, then the following error message is displayed:

```
Link out of range, please press HELP
```

If the link has not been administered, then the following message is displayed:

```
Link not administered or not enabled
```

If there are no tests for the current MO, the following message is displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	Port address on the Processor Interface board associated with the link-id being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS", "ABORT", "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

Following is an sample output for the command "test link 1 long".

```
test link 1 long


                             TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01AXX01   PI-LINK                     182      PASS
  01AXX01   PI-LINK                     183      PASS
  01AXX01   PI-LINK                     234      PASS
  01AXX01   PI-LINK                     233      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test maintenance

This command will test the EPN maintenance circuit pack in any Expansion Port Network control carrier.

SYNOPSIS

test maintenance location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test maintenance 2
test maintenance 3 schedule
test maintenance 2 sh
test maintenance 2 l c

DESCRIPTION

The test maintenance command performs hardware diagnostic tests on a technician specified maintenance circuit pack. Specifying cabinets 2 through 3 will allow testing of any connected EPN maintenance circuit packs.

For the EPN maintenance circuit pack, the SAT interface, EI link, reset and sanity functions are tested. The long test resets the EPN maintenance circuit pack causing the EPNSAT link to be dropped and is destructive.

Defaults

The default for the parameters are short with a repeat of 1.

Parameters

location	The location designates the physical position of the desired maintenance circuit pack. The location consists of a cabinet number and carrier letter. The cabinet number is one or two digits from 2 to 3 with leading zeros allowed.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This includes both destructive and nondestructive tests for this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test maintenance", the following message will be displayed:

```
Enter [cabinet(2-3)];carrier(A)],
['long' or 'short'],   ['repeat'(1-100)
or 'clear'], ['schedule']
```

Error Messages

For any system, if the entered value is invalid, the following message will be displayed:

```
Identifier invalid
```

If the port network specified is not available, the following message will be displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) of the maintenance object that is being tested. For this maintenance object, only the cabinet and carrier values are displayed.
Maintenance Name	The maintenance name will always be MAINT.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "DISABLED."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test maintenance 2".

```
test maintenance 2


                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  02A     MAINT                       106      PASS
  02A     MAINT                       229      PASS
  02A     MAINT                       303      PASS
  02A     MAINT                       337      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

The long test on EPN maintenance circuit packs will cause the EPNSAT link to be dropped. The reset test is the last test and drops this link.

test memory

This command will test memory circuit packs.

SYNOPSIS

test memory location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test memory
test memory a
test memory a schedule
test memory 1a2
test memory b1 sh
test memory b l r 25
test memory a l c

DESCRIPTION

This command performs hardware diagnostic tests on any one memory circuit packs or on all memory circuit packs in the technician specified carrier. Neither the short nor the long test is destructive when testing memory.

Defaults

The cabinet default is always cabinet 1. For SPE simplex systems, the default carrier is the "a" carrier. For SPE duplex systems, there is no default carrier. The defaults for the remaining parameters are short with a repeat of 1.

Parameters

location	The location designates the physical position of the desired memory circuit pack. The location consists of a cabinet number and carrier letter. The cabinet number is always optional and must be a "1" or a "01" if entered. The carrier must be either "a" or "b" for SPE duplex systems. For SPE simplex systems, the carrier must be "a" if entered.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. The long version does not include any destructive tests for this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test memory" on a simplex SPE system the following message will be displayed:

```
      Enter [cabinet(1)];carrier(A),
['long' or 'short'],   ['repeat' (1-100)
        or 'clear'], ['schedule']
```

If the system technician presses HELP after entering "test disk" on a duplex SPE system the following message will be displayed:

```
Enter [cabinet(1)];carrier(A-B),
['long' or 'short'],   ['repeat' (1-100)
or 'clear'], ['schedule']
```

Error Messages

For SPE duplex systems, if no carrier is entered on the command line, the following message will be displayed:

```
A carrier must be specified for duplex systems
```

For any system, if the length of the user entered parameter exceeds five (5), the following message will be displayed:

```
Entry invalid
```

On any system, if any cabinet other than "1" or "01" is specified, the following message will be displayed:

```
Only cabinet '1' may be specified for this command
```

If a carrier is entered which is not valid for the current system configuration (for example, anything other than "A" or "B" for SPE duplex and anything other than the 'a' carrier for SPE simplex), the following message will be displayed:

```
Carrier out of range;
Enter 'a' if SPE simplex, 'a' or 'b' if SPE duplex
```

If the standby SPE was specified, and it does not respond, the following message will be displayed:

```
Standby SPE not available;
for information use 'status system'
```

If an invalid position number is entered, the following message will be displayed:

```
Board position is invalid
```

If a non administered circuit pack location is entered, the following message will be displayed:

```
Memory Board not assigned
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested will be MEM-BD for 286 systems and MEMORY for 386 systems.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL".
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test memory 1b".

```
test memory 1b


                          TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  01B     MEM-BD                      87       PASS
  01B     MEM-BD                      631      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test modem-pool

This command will perform hardware diagnostic tests on the specified modem pool group or an individual member of a specified group.

SYNOPSIS

test modem-pool group*/member [short | long] repeat number schedule*

PERMISSIONS

The following default logins may execute this command: init, inads, system technician.

EXAMPLES

test modem-pool 1
test modem-pool 1 schedule
test modem-pool 1/3 l r 2
test modem-pool 1/3 l r 2 schedule
test modem-pool 2 r 2
test modem-pool 2 l

DESCRIPTION

The "test modem-pool" command performs hardware diagnostic tests on all of the members that are in a modem-pool group or, on a single member if the optional member number is supplied.

If the member number is supplied, what is tested depends on the type of modem-pool group, Combined or Integrated. A Combined modem-pool group consists of pairs of Analog and Digital Line ports. One pair of Analog and Digital Line ports used for modem-pooling is called a conversion resource. An Integrated group, on the other hand, consists of modem-pool circuit packs each of which contains two conversion resources. Therefore, when a member number is specified for a Combined modem-pool group, one conversion resource is tested and when a member number is specified for an Integrated modem-pool group, two conversion resources are tested.

Defaults

The default for the command is short with a repeat number of 1.

Parameters

group number	The group number is assigned from administration. The group number may be any administered group from 1-5.
member number	The member number is assigned from administration. A member is a pair of analog and digital line ports (or two pair for the Integrated modem-pool case). The member number may be any administered group member from 1-32.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	This number specifies how many times each test in the sequence is to be repeated. The number may be any integer between 1 and 100. For example, if number = 2, then each test in the sequence is executed twice.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test modem-pool" the following message will be displayed:

```
Enter group #(1-5) or group #/member #,
['long' or 'short'], ['repeat' (1-100)],
['schedule'] or press CANCEL to cancel the command
```

Error Messages

If the "test modem-pool" command is entered from a login for which the command is not valid, then the following message will be displayed:

```
"test" is an invalid entry; please press HELP
```

If the group or member numbers entered are not digits, then the following message will be displayed:

```
Identifier invalid
```

If the group number or member number entered is not within the valid range of groups or members, the following message will be displayed:

```
Boards not assigned
```

If the group is not administered or is administered but with no members, the following message will be displayed:

```
Group not assigned, or group
assigned but with no member
```

If the a member is assigned, but the port is does not exist in the system, then the following message is displayed:

```
Port not assigned
```

If there are no tests found for the maintenance object, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested. This is always MODEM-PT.
Alt. Name	This field is not applicable to this command.

Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

In the following output example, the command "test modem-pool 1/3" was entered.

```
test modem-pool 1/3 short                         SPE B


                              TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C0701   MODEM-PT                  98       PASS
  01C0701   MODEM-PT                  99       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test network-control

This command will test a network control board.

SYNOPSIS

test network-control location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test network-control
test network-control a l
test network-control b sh r 2
test network-control b l r 25
test network-control a
test network-control a c

DESCRIPTION

The test network-control command performs hardware diagnostic tests on a technician specified network control circuit pack.

Defaults

The default for the command is cabinet 1, carrier a, short with a repeat of 1.

Parameters

location	The location designates the desired network control board carrier in a High or Critical Reliability System (i.e. "a" or "b").
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test network-control" the following message will be displayed for a simplex switch configuration:

```
Enter ['long' or 'short'], ['repeat' (1-100)
        or 'clear'], ['schedule']
```

For a duplex switch configuration, the following message will be displayed:

```
Enter [cabinet(1)];carrier(A-B),
['long' or 'short'], ['repeat' (1-100)
or 'clear'], ['schedule']
```

Error Messages

If the SPE is not active, the following message will be displayed:

```
Command must be executed from active SPE
```

If the carrier entered is invalid, the following message will be displayed:

```
"entered value" is an invalid identifier;
press RETURN to execute modified command
```

If the switch system is a 386 system [G3iV2-386, G3sV2, G3vsV2], and the NETCON board is not TN777B, then the following message will be displayed:

```
Must install TN777B circuit pack
```

If the entered standby carrier cannot be retrieved, the following message will be displayed:

```
Error encountered, can't complete request
```

If there aren't any tests found for this MO, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested. This object is always associated with cabinet 1. For maintenance objects: DATA-BD, SW-CTL, 12V-PWR, CARD-MEM, the slot and circuit fields of port address are blank. The administered data channel maintenance object, DATA-CHL, uses the "XX" as the slot address and has a circuit number between 01 and 04. The carrier field has a value "A" for the control carrier A in a simplex system, and "A" or "B" for control carriers A and B in a duplex system.
Maintenance Name	The type of maintenance object that is being tested. The maintenance objects are: DATA-BD for Network Control board, SW-CTL for Switch Control Arch-angel, DATA-CHL for administered data channel, 12V-PWR for 12 volt power supply unit on Network Control board, CARD-MEM for flash memory card on Network Control board. 12V-PWR and CARD-MEM are shown only when the Network Control board is TN777B in 386 systems [G3iV2-386, G3sV2, G3vsV2].
Alt. Name	This field contains the extension number of the DATA-CHL if administered. For other maintenance objects, this field is not applicable and left empty.
Test No	The actual test that is being executed.
Result	An indicator such as "PASS" for test passed, "FAIL" for test failed, "ABORT" for test was aborted, "NO BOARD" for no Network Control Board was inserted.
Error Code	A system-generated number that tells why the individual test failed or was aborted. A detailed list of the codes according to "Test No." is provided for each maintenance object.

For the following output example, assume that the entered command was "test network-control a".

```
test network-control a


                              TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result      Error Code
  01A       DATA-BD                     52       PASS
  01AXX01   DATA-CHL          4001      109      PASS
  01AXX01   DATA-CHL          4001      110      PASS
  01AXX01   DATA-CHL          4001      111      PASS
  01A       SW-CTL                      95       PASS
  01A       SW-CTL                      92       PASS
  01A       SW-CTL                      94       PASS
  01A       SW-CTL                      324      PASS
  01A       12V-PWR                     701      PASS
  01A       CARD-MEM                    695      PASS
  01A       CARD-MEM                    696      PASS
  01A       CARD-MEM                    697      PASS
  01A       CARD-MEM                    698      PASS
  01A       CARD-MEM                    699      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test packet-control

This command will test the specified packet-control.

SYNOPSIS

test packet-control *location [short | long][repeat (1-100) | clear] [schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms

EXAMPLES

test packet-control
test packet-control A
test packet-control B
test packet-control 1A
test packet-control 1B
test packet-control a short
test packet-control a s repeat 5
test packet-control b s r 5
test packet-control b long clear
test packet-control b l r 25

DESCRIPTION

The test packet-control command performs hardware diagnostic tests on a technician specified packet-control circuit pack.

Defaults

For simplex systems, the location is optional and defaults to cabinet 1, carrier A. For duplex systems, the cabinet default is again cabinet 1, but there is no default for the carrier.

Parameters

location	The location only applies to duplicated configurations. If the configuration is a simplex, the location parameter is not used and thus is not valid. For duplicated configurations, a "location" represents the carrier that the packet-control resides on in the system. Valid locations are either 1A or 1B.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. The long version does not include any destructive tests for this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if on exists against the packet-control) is cleared or a single test in the sequence fails. If no alarms are registered against the packet-control the test sequence will be run only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms related to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test packet-control", the following message is displayed:

```
Enter [cabinet(1)]; carrier (A-B),
['long' or 'short'], ['repeat' (1-100)
or 'clear'], ['schedule']
```

Error Messages

If this command is executed on the standby SPE and this SPE is busy at the moment, the following will be displayed:

```
Standby SPE busy;
See status system for more details
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

Port	This field represents the Cabinet-Carrier in which the Packet-Control resides.
Maintenance Name	The type of maintenance object that is being busied out.
Alt. Name	This field is not used in this output display.
Test No.	This field lists the test run on the packet-control.
Result	An indicator as to whether the object was successfully busied out ("PASS", "FAIL", "ABORT", "NO BOARD", "DISABLED", "EXTRA BD").
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the coeds according to "Test No." is provided for each MO.

For the following output example, the command test packet-control 1B long was entered. Note that carrier B is the active carrier in these example outputs.

```
test packet-control 1B l

                              TEST RESULTS

 Port    Maintenance Name  Alt. Name Test No.  Result      Error Code

 01B     PKT-CTRL                     583      PASS
 01B     PKT-CTRL                     584      PASS
 01B     PKT-CTRL                     585      PASS


Command successfully completed
```

For the following output example, the command test packet-control 1B was entered. Note that carrier B is the active carrier in these example outputs.

```
test packet-control 1B


                             TEST RESULTS

 Port    Maintenance Name  Alt. Name Test No.  Result      Error Code
 01B     PKT-CTRL                      585      PASS


Command successfully completed
```

For the following output example, the command test packet-control 1A was entered. Note that carrier A is the standby carrier in these example outputs.

```
test packet-control 1A


                             TEST RESULTS

 Port    Maintenance Name  Alt. Name Test No.  Result     Error Code
 01A     PKT-CTRL                   586        PASS
 01A     PKT-CTRL                   583        PASS
 01A     PKT-CTRL                   585        PASS


Command successfully completed
```

FEATURE INTERACTIONS

The reset packet-control test (586) does not run on the active packet-control. This test is part of the standby packet-control test sequence as illustrated in the OUTPUT section of this manual page.

test pkt

This command will test the Packet bus on the specified PPN or EPN.

SYNOPSIS

test pkt port-network pn number *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test pkt port-network 1 l
test pkt port-network 2 sh r 2
test pkt port-network 2 sh schedule
test pkt port-network 1 l r 25
test pkt port-network 2
test pkt port-network 1 c

DESCRIPTION

The test pkt runs a series of diagnostic packet bus tests that return results of the test along with possible error codes to the user.

Defaults

The default for this command is short with a repeat of 1.

Parameters

pn number	The individual Packet bus to be tested is entered as "NN" where "NN" represents the port network number of the port network to have its Packet bus tested. A port network number (1-3) may be entered.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test pkt" the following message will be displayed:

```
Enter ’port-network’, port network number (1-3),
     [’long’ or ’short’], [’repeat’ (1-100)
            or ’clear’], [’schedule’]
```

Error Messages

If the technician does not enter all digits for the port-network number, the following message will be displayed:

```
Entry must be all digits
```

If the port network on which the desired Packet bus resides is unavailable, the following message will be displayed:

```
EPN is not available
```

For any system, if the length of the user entered parameter "port network" exceeds 3 the following message will be displayed:

```
Entry invalid
```

If the packet bus is not activated the following message will be displayed:

```
Packet Bus is not activated,
check system-parameters maintenance form
```

If no tests can be found for the associated MO, the following message is displayed:

```
No tests for this MO
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can’t complete request
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	A port network number is displayed (1-3).
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO [for example, see MO section on "PKT-BUS (Packet Bus)"].

For the following output example, assume that the command that was entered was "test pkt port-network 1".

```
test pkt port-network 1


                 TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  PN 01   PKT-BUS                     571      PASS
  PN 01   PKT-BUS                     572      PASS
  PN 01   PKT-BUS                     573      PASS


Command successfully completed
```

FEATURE INTERACTIONS

None.

test pms-link

This command will test a property management system link.

SYNOPSIS

test pms-link *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test pms-link sh r 5
test pms-link l
test pms-link
test pms-link c
test pms-link c sch

DESCRIPTION

The test pms-link command will perform the specified property management system link tests on the specified pms link, by checking to see if the link is accessible and then performing a reset on the link. The above scenario is for the long test only.

For general information on PMS links, see the second paragraph in the "DESCRIPTION" section of the "busyout pms-link" manual pages.

For information on what a PMS is and does, see the second paragraph in the "DESCRIPTION" section of the "status pms-link" manual pages.

Defaults

The default for the command is short with the repeat of 1.

Parameters

short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test pms-link" the following message will be displayed:

```
Enter ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the link is not administered, the following error message will be displayed:

```
Link not administered or not enabled
```

If no tests can be found for the link, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	With this object the port field is blank.
Maintenance Name	The type of maintenance object that is being tested (always PMS-LINK).
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test pms-link l".

```
test pms-link long

                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          PMS-LINK                    214      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

The maintenance of a particular component on a link will sometimes interfere with the maintenance of the link itself. Maintenance can put a link component in a busy state causing link set-up to fail. Frequent attempts at re-setup of a link may delay the recover of a faulty component, due to the maintenance test of a component only taking place when the component is idle. Therefore, the technician needs to be able to disable the attempted re-setup of a link. The busyout command is used to do this, and will cause the link to be torn down. If the link is already down, the busyout command will stop periodic re-setup trys on the link.

test port

This command will perform hardware diagnostic tests on an individual port circuit.

SYNOPSIS

test port location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test port 01c1101 l
test port 01c1101 l schedule
test port 02e1502 sh r 2
test port 02d1201 r 4
test port 01c1101 c

DESCRIPTION

The test port command performs hardware diagnostic tests on an individual port circuit. In most cases, tests will be performed on hardware that is connected to the port. The technician must specify the port on the port carrier board which the tests are to be performed on.

Defaults

The default for the command is short with the repeat of 1.

Parameters

location	A "location" represents the physical position of the port to be tested and is entered as "UUcSSpp" where "UU" represents the cabinet number (1-3), "c" represents the carrier, "SS" represents the slot position, and "pp" represents the circuit.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence. **WARNING:** *Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.*
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test port" the following message will be displayed:

```
Enter port location, ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the format for the port location is incorrect, the following error message will be displayed:

```
Port/Board invalid
```

If the EPN on which the port resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the board on which the port resides is not configured in the system, the following message will be displayed:

```
Port not assigned
```

If there are no tests found for this maintenance object, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station, and it contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the port in cabinet 1, carrier c, slot 7, circuit 1 is an analog port. The command that was entered was "test port 1c0701".

```
test port 01c0701 short


                 TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C0701   ANL-LINE                    35       PASS
  01C0701   ANL-LINE                    48       PASS
  01C0701   ANL-LINE                    36       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test pri-endpoint

This command will perform hardware diagnostic tests on all port circuits (B-channels) that are associated with the PRI endpoint extension.

SYNOPSIS

test pri-endpoint extension *[short | long] repeat number schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init, nms.

EXAMPLES

test pri-endpoint 25012
test pri-endpoint 45002 sh
test pri-endpoint 45892 l
test pri-endpoint 24389 sh r 4
test pri-endpoint 34899 l r 6
test pri-endpoint 34912 l r 5 schedule
test pri-endpoint 93483 r 2
test pri-endpoint 10022 c
test pri-endpoint 92349 schedule

DESCRIPTION

The test pri-endpoint command performs hardware diagnostic tests on all port circuits (B-channels) that are associated with the specified PRI endpoint.

Defaults

The default for the command is short with repeat number of 1.

Parameters

extension	The extension of the PRI endpoint to be tested. The number of digits in an extension is determined by the dial-plan.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of nondestructive diagnostic tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the user presses HELP after entering "test pri-endpoint", the following message is displayed:

```
Enter extension number, ['long' or 'short'],
      ['repeat' (1-100)], ['schedule']
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the PRI endpoint resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a PRI endpoint, the following message will be displayed:

```
Extension assigned to object other than pri-endpoint
```

If the board that contains the PRI endpoint is not inserted in the system, the following message will be displayed:

```
Board not inserted
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a port-by-port and test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested. The name for PRI endpoint port is "PE-BCHL".
Alt. Name	The alternate way of identifying the maintenance object. This field contains the specified extension number of the PRI endpoint.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, the command "test pri-endpoint 22501" was entered. Assume that the PRI endpoint ports for extension 22501 are in cabinet 1, carrier B, slot 20, circuit 1 to 3.

```
test pri-endpoint 22501 short                    page 1 of 1


                            TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result      Error Code
  01B2001   PE-BCHL           22501     36       PASS
  01B2001   PE-BCHL           22501     255      PASS
  01B2001   PE-BCHL           22501     256      PASS
  01B2001   PE-BCHL           22501     257      PASS
  01B2002   PE-BCHL           22501     36       PASS
  01B2002   PE-BCHL           22501     255      PASS
  01B2002   PE-BCHL           22501     256      PASS
  01B2002   PE-BCHL           22501     257      PASS
  01B2003   PE-BCHL           22501     36       PASS
  01B2003   PE-BCHL           22501     255      PASS
  01B2003   PE-BCHL           22501     256      PASS
  01B2003   PE-BCHL           22501     257      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test processor

This command will test the processor circuit pack.

SYNOPSIS

test processor location *[short | long] clear schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test processor
test processor schedule
test processor a
test processor 1a
test processor b sh
test processor a l c

DESCRIPTION

The test processor command performs hardware diagnostic tests on a technician specified processor circuit pack.

Defaults

For SPE simplex systems, the location is optional and defaults to cabinet 1, carrier "a". For SPE duplex systems, the cabinet default is again cabinet 1 but there is no default for the carrier. Defaults for the remaining parameters are short with a repeat of 1.

Parameters

location	The location designates the physical position of the desired processor. The location consists of a cabinet number and carrier letter. The cabinet number is always optional and must be a "1" or a "01" if entered. The carrier is an optional "a" for SPE simplex systems but is required for SPE duplex systems and must be either "a" or "b" in this case.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. The long version does not include any destructive tests for this command.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test processor" on a simplex SPE system the following message will be displayed:

286:

```
Enter ['long' or 'short'], ['clear'], ['schedule']
```

386:

```
Enter ['long' or 'short'],
['repeat'(1-100) or 'clear'], ['schedule']
```

If the system technician presses HELP after entering "test processor" on a duplex SPE system the following message will be displayed:

286:

```
Enter [cabinet(1)];carrier(A-B),
      ['long' or 'short'],
    ['clear'], ['schedule']
```

386:

```
Enter [cabinet(1)];carrier(A-B),
      ['long' or 'short'],
['repeat'(1-100) or 'clear'], ['schedule']
```

Error Messages

For SPE duplex systems, if no carrier is entered on the command line, the following message will be displayed:

```
A carrier must be specified for duplex systems
```

For any system, if the length of the user entered parameter exceeds three (3), the following message will be displayed:

```
Entry invalid
```

On any system, if any cabinet other than "1" or "01" is specified, the following message will be displayed:

```
Only cabinet '1' may be specified for this command
```

If a carrier is entered which is not valid for the current system configuration (for example, anything other than "A" or "B" for SPE duplex and anything other than the 'a' carrier for SPE simplex), the following message will be displayed:

```
Carrier out of range;
Enter 'a' if SPE simplex, 'a' or 'b' if SPE duplex
```

If the standby SPE was specified, and it does not respond, the following message will be displayed:

```
Standby SPE not available;
for information use 'status system'
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested will be PROCR, PR-MAINT and MEMORY (MEMORY will be displayed only for the 386 processor).
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD".
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test processor a" for a 286 processor.

```
test processor a                               SPE B


                         TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result      Error Code
  01A     PROCR                       77       PASS
  01A     PROCR                       80       PASS
  01A     PROCR                       82       PASS
  01A     PR-MAINT                    102      ABORT       1018
  01A     PR-MAINT                    103      ABORT       1018
  01A     PR-MAINT                    106      PASS
  01A     PR-MAINT                    228      PASS
  01A     PR-MAINT                    229      ABORT       1018


Command successfully completed
```

"test processor a" for a 386 processor.

```
test processor a                               SPE B


                          TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result      Error Code
  01A     PROCR                           77      PASS
  01A     PROCR                           80      PASS
  01A     PROCR                           82      PASS
  01A     PR-MAINT                       102      ABORT       1018
  01A     PR-MAINT                       103      ABORT       1018
  01A     PR-MAINT                       106      PASS
  01A     PR-MAINT                       228      PASS
  01A     PR-MAINT                       229      ABORT       1018
  01A     MEMORY                          87      PASS
  01A     MEMORY                         631      PASS


Command successfully completed
```

FEATURE INTERACTIONS

None.

test shadow-link

This command allows the technician to test the shadow link.

SYNOPSIS

test shadow-link *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test shadow-link l
test shadow-link sh r 2
test shadow-link sh r 2 schedule
test shadow-link c

DESCRIPTION

The test shadow-link command performs hardware diagnostics for the shadow link between the two duplication-interface circuit packs. This command works only with a High or Critical Reliability System. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for more details.

Defaults

The default for the command is short with the repeat of 1.

Parameters

short	The short and long test sequence both execute only test #318.
long	The short and long test sequence both execute only test #318.

repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test shadow-link" the following message will be displayed:

```
Enter ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
   Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address will always be blank for this command.
Maintenance Name	The maintenance name will always be SHDW-LNK for this command.
Alt. Name	Not applicable.
Test No	The test number will always be 318 for this command.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "DISABLED,".
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test shadow-link"

```
test shadow-link

                              TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          SHDW-LNK                    318      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test signaling-group

This command performs a set of hardware diagnostic tests on the specified signaling group. The tests vary according to whether a short or long option is specified.

SYNOPSIS

test signaling-group group identifier *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test signaling-group 1
test signaling-group 1 repeat 10
test signaling-group 2 short
test signaling-group 4 long
test signaling-group 4 long clear
test signaling-group 2 schedule

DESCRIPTION

The test signaling-group validates that the specified signaling group is administered and runs a series of diagnostic tests that return results of the test along with possible error codes to the user.

A signaling group is a collection of B-channels signaled for by a designated single D-channel or set of D-channels over an ISDN-PRI.

Defaults

The default for the command is short with the repeat of 1.

Parameters

group identifier	The signaling group identifier is an administered number associated with each signaling group (1-8).
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:
Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test signaling-group", the following is displayed:

```
Enter group identifier (1-8), ['long' or 'short'],
    ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the specified group identifier is non numeric or out of range, the following message is displayed:

```
Signaling group invalid
```

If the specified group identifier is not administered, the following message is displayed:

```
No signaling group assigned
```

If no tests can be found for the associated MO, the following message is displayed:

```
No tests for this MO
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can't complete request
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The signaling group number (1-8) of the signaling group that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not Applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO [for example, see MO section on "ISDN-SGR (ISDN-PRI Signaling Group)"].

For the following output example, assume that the command "test signaling-group 1" was entered.

```
test signaling-group 1                           SPE A


                           TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  1       ISDN-SGR                    636      PASS
  1       ISDN-SGR                    639      PASS
  1       ISDN-SGR                    637      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Additional data is available after running a test. See the status signaling-group command for details on how to access the additional data.

test sp-link

This command performs a set of hardware diagnostic tests on the system printer link (if one exists). The tests vary according to whether a short or long option is specified.

SYNOPSIS

test sp-link *[short | long] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test sp-link
test sp-link sh
test sp-link l
test sp-link schedule
test sp-link sh sch

DESCRIPTION

The test sp-link command validates that the system printer link is administered and runs a series of diagnostic tests that return results of the test along with possible error codes to the user.

The system printer link is a link from the switch to an external printer over which jobs can be printed. This link is created by administering the system printer extension and setting up a call to the system printer.

Defaults

The default for the command is short.

Parameters

short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test sp-link", the following is displayed:

```
Enter ['long' or 'short'], ['schedule']
```

Error Messages

If the system printer link is not administered, the following message is displayed:

```
Link not administered or not enabled
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message is displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message is displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	Not applicable. Will always be blank.
Maintenance Name	The type of maintenance object that is being tested. This will always be "SYS-PRNT".
Alt. Name	Not applicable. Will always be blank.

Test No	The actual test that is being executed.
Result	The result of the individual test - "PASS", "ABORT", "FAIL", "NO BOARD", "DISABLED", "EXTRA BD".
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example the command entered was "test sp-link".

```
test sp-link                                  SPE A


                             TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          SYS-PRNT                    215      PASS
          SYS-PRNT                    213      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test spe-standby

This command allows the technician to test the standby Switch Processing Element.

SYNOPSIS

test spe-standby *[short | long][repeat number | clear]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test spe-standby long
test spe-standby l
test spe-standby s r 2
test spe-standby c

DESCRIPTION

The test spe-standby command performs hardware diagnostic tests on the standby Switch Processing Element (SPE) in a duplex SPE system. This command tests all MOs in the standby MO. The STBY-SPE MO itself does not have any defined tests. Instead tests are run on the following MOs when the **test spe-standby** command is run. Refer to the sections for these MOs for more details. This command is only for a High or Critical Reliability System. This command will run the following tests on the standby SPE:

1. MEM-BD (286 systems)
2. MEMORY (386 systems)
3. SHDW-LNK
4. SHDW-CIR
5. SPE_SELEC
6. DUPINT
7. DATA-BD
8. DATA-CHL
9. SW-CTL
10. PROCR
11. PR-MAINT

12. 12V-PWR (386 systems only)
13. CARD-MEM (386 systems only)
14. FL-DATA (386 systems only)
15. TAPE (286 systems only)
16. TAPE-DATA (286 systems only)
17. PI-BD
18. PI-PT
19. PKT-CTRL

Defaults

The defaults for this command are short with a repeat of 1.

Parameters

short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

Help Messages

If the system technician presses HELP after entering "test spe-standby" the following message will be displayed:

```
Enter ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If the standby is entering maintenance mode when this command is executed, then the following message is displayed:

```
Cannot interrupt Standby SPE while entering
    maintenance mode; please try later
```

If the standby SPE is not refreshed when this command is executed, then the following message is displayed:

```
Standby SPE memory not refreshed;
use the "refresh spe-standby" command.
```

If the standby SPE is not refreshed and the active SPE is hard selected via the SPE select switches when this command is executed, then the following message is displayed:

```
Active SPE locked via select switches;
   Standby SPE memory not refreshed
```

If the standby SPE is busy with another task, then the following message is displayed:

```
Standby SPE busy with another task;
for information use "status system 1"
```

If the standby SPE is not available when this command is executed, then the following message is displayed:

```
Standby SPE not available;
for information use "status system 1"
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested. This maintenance object will display the cabinet and carrier location of the standby SPE only.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a data module.

Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED,".
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the standby SPE is located in carrier B and the command entered is "test spe-standby".

```
test spe-standby                               SPE A


                            TEST RESULTS

Port    Maintenance Name Alt. Name Test No. Result       Error Code
01B     SHDW-CIR                   285                   PASS
01B     SHDW-CIR                   284                   PASS
01B     SPE-SELECT                 278                   PASS
01B     DUPINT                     315                   PASS
 .        .                         .                      .
 .        .                         .                      .
 .        .                         .                      .


Command Successfully Completed
```

FEATURE INTERACTIONS

The testing of the standby SPE maintenance object makes the standby SPE unavailable to take over for the active SPE.

test station

This command performs hardware diagnostic tests on an individual port circuit that is associated with the extension.

SYNOPSIS

test station extension *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init, nms.

EXAMPLES

test station 81709 l
test station 85136 s r 2
test station 85036 l r 25
test station 85036 l r 25 schedule
test station 84297 r 4
test station 81709 c

DESCRIPTION

The test station command performs hardware diagnostic tests on an individual port circuit assigned to that extension. Tests will be performed on the hardware that is connected to the port. The technician must specify the extension and a translation is automatically done to the physical port location.

Defaults

The default for the command is short with the repeat of 1.

Parameters

extension	The extension of the station to test. The number of digits in an extension is determined by a dial-plan.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.

WARNING:

Since the "clear long" options clear all counters if tests pass, it is possible for firmware counters to be cleared even when a problem exists. In some cases customer service might degrade since calls may be routed over defective equipment.

schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test station" the following message will be displayed:

```
 Enter extension, ['long' or 'short'],
['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the format for the extension is incorrect, the following error message will be displayed:

```
Extension invalid
```

If the EPN on which the port resides is not accessible, the following message will be displayed:

```
EPN is not available
```

If the extension is not administered, the following message will be displayed:

```
Extension not assigned
```

If the object associated with the specified extension is not a station, the following message will be displayed:

```
Extension exists but assigned to a different object
```

If the board that contains the port is not inserted in the system, the following message will be displayed:

```
Board not assigned
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains the extension when the object is a station.

Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the port in cabinet 1, carrier c, slot 7, circuit 1 is an analog port and extension 81902 is connected to that port. The command that was entered was "test station 81902".

```
test station 81902 short


                            TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C0701   ANL-LINE                    35       PASS
  01C0701   ANL-LINE                    48       PASS
  01C0701   ANL-LINE                    36       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test synchronization

This command will update all the boards involved with synchronization.

SYNOPSIS

test synchronization *[short | long] [repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test synchronization r 3
test synchronization sh r 1
test synchronization sh r 1 schedule
test synchronization l

DESCRIPTION

The test synchronization command will make sure that the proper sources are being used for timing synchronization and will update the boards with the correct synchronization parameters. The tone-clocks, DS1s, and EIs are all sent down-link messages to place them in the correct synchronization configuration given the current on-line synchronization reference.

The synchronization subsystem provides error free digital communication between the switch and other PBXs, COs, or customer premise equipment. The subsystem is made up of system components involved in synchronization: TDM bus clock, DS1 trunk board, maintenance and administration software resident in the SPE.

Defaults

The default for this command is short with a repeat of 1.

Parameters

short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This will involve both destructive and nondestructive tests. For the synchronization maintenance object, the same nondestructive test is run for both the short and long tests: test 417. If stratum-3 synchronization is administered, an additional nondestructive test (649) is also run.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against synchronization maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against synchronization maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test synchronization", the following message will be displayed:

```
Enter ['long' or 'short'], ['repeat' (1-100)
        or 'clear'], ['schedule']
```

Error Messages

If there are no tests found for synchronization maintenance object, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	Not applicable.
Maintenance Name	The maintenance object being tested is Synchronization.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

The command that was entered was "test synchronization short".

```
test synchronization short


                            TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
          SYNC                        417      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test tape

This command tests the tape.

SYNOPSIS

test tape location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test tape
test tape schedule
test tape a
test tape 1a
test tape b sh
test tape b l r 25
test tape 01b l r 25
test tape 01b l r 25 schedule
test tape a l c

DESCRIPTION

The test tape command will perform a series of tests on the tape circuit pack and tape cartridge. The tape cartridge is rewound and only a specific portion of the tape cartridge is used in the test for actual reads and writes. Tapes used for core dumps have an incompatible file system and shouldn’t be used with this command.

Defaults

For SPE simplex systems, the location is optional and defaults to cabinet 1, carrier "a". For SPE duplex systems, the cabinet default is again cabinet 1 but there is no default for the carrier. Defaults for the remaining parameters are short with a repeat of 1.

Parameters

location	The location designates the physical position of the desired tape. The location consists of a cabinet number and carrier letter. The cabinet number is always optional and must be a "1" or a "01" if entered. The carrier is an optional "a" for SPE simplex systems but is required for SPE duplex systems and must be either "a" or "b" in this case.
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. The long version does not include any destructive tests with this command.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against tape) is cleared or a single test in the sequence fails. If no alarms are registered against tape then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test tape" on a simplex SPE system, the following message will be displayed:

```
Enter [cabinet(1);carrier(A)],['long' or 'short'],
     ['repeat'(1-100) or 'clear'], ['schedule']
```

If the system technician presses HELP after entering "test tape" on a duplex SPE system the following message will be displayed:

```
Enter [cabinet(1)];carrier(A-B),['long' or 'short'],
     ['repeat' (1-100) or 'clear'], ['schedule']
```

For SPE simplex systems, the carrier is optional and should be the ’a’ carrier if entered. For SPE duplex systems, the carrier is required and must be either ’a’ or ’b’.

Error Messages

For SPE duplex systems, if no carrier is entered on the command line, the following message will be displayed:

```
A carrier must be specified for duplex systems
```

For any system, if the length of the user entered parameter exceeds three (3), the following message will be displayed:

```
Entry invalid
```

On any system, if any cabinet other than "1" or "01" is specified, the following message will be displayed:

```
Invalid port-network specified.
```

If a carrier is entered which is not valid for the current system configuration (for example, anything other than "A" or "B" for SPE duplex and anything other than the ’a’ carrier for SPE simplex), the following message will be displayed:

```
Invalid port-network specified.
```

If the standby SPE was specified, and it does not respond, the following message will be displayed:

```
Standby SPE not available; for information use ’status spe’
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
’login id’:’command’ has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	For the tape maintenance object, only the cabinet and carrier values are displayed.
Maintenance Name	The maintenance object being tested is TAPE.
Alt. Name	Not applicable.
Test No.	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test tape".

```
test tape


                            TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  01A     TAPE                        230      PASS
  01A     TAPE                         66      PASS
  01A     TAPE                         69      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

This command will abort if any other tape operation has already begun.

Failure of the tape test may result in the tape being placed in an out-of-service state. In this state, access to the tape by all system software except maintenance software is blocked.

Tapes used for core dumps have an incompatible file systems and can’t be used for this command.

test tdm

This command tests all the time slots on a bus associated with a PPN or an EPN.

SYNOPSIS

test tdm port-network pn number *[short | long][repeat number | clear][schedule]*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test tdm port-network 1 l
test tdm port-network 2 sh r 2
test tdm port-network 2 sh sch
test tdm port-network 1 l r 25
test tdm port-network 2
test tdm port-network 1 c

DESCRIPTION

The test tdm command performs hardware diagnostic tests on the time slots of the desired bus.

Defaults

The default for this command is short with a repeat of 1.

Parameters

pn number	The individual TDM bus to be tested is entered as "NN" where "NN" represents the port network number of the port network to have its TDM bus tested. Both halves ("a" and "b") of the TDM bus will be tested. A port network number (1 - 3) may be entered with or without a leading zero (0).
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the TDM-BUS maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the TDM-BUS maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test tdm" the following message will be displayed:

```
Enter 'port-network', port network number (1-3),
['long' or 'short'], ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the technician does not enter all digits for the port-network number, the following message will be displayed:

```
Entry must be all digits
```

If the technician enters a Port Network number that is not administered, the following message will be displayed:

```
Port Network number not assigned
```

If the port network on which the desired TDM bus resides is unavailable, the following message will be displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	For TDM-BUS maintenance object the port network number and the bus (A or B) is displayed.
Maintenance Name	The maintenance object being tested is TDM-BUS.
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test tdm port-network 1".

```
test tdm port-network 1


                            TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  PN 01A  TDM-BUS                     294      PASS
  PN 01A  TDM-BUS                     296      PASS
  PN 01A  TDM-BUS                     297      PASS
  PN 01B  TDM-BUS                     294      PASS
  PN 01B  TDM-BUS                     296      PASS
  PN 01B  TDM-BUS                     297      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test tone-clock

This command will test a tone/clock board.

SYNOPSIS

test tone-clock location *[short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test tone-clock 01a l
test tone-clock 01b l schedule

DESCRIPTION

The test tone/clock command performs hardware diagnostic tests on a technician specified tone/clock circuit pack.

Defaults

The default for the command is short with a repeat of 1.

Parameters

location	A "location" represents the physical position of the tone/clock to be tested and is entered as "UUc" where "UU" represents the cabinet number, and "c" represents the carrier. A cabinet number (1 - 3) may be entered with or without a leading zero (0).
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the tone clock circuit pack) is cleared or a single test in the sequence fails. If no alarms are registered against the tone clock circuit pack then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test tone-clock" the following message will be displayed:

```
Enter [[cabinet(1-3)];carr(A-B)],['long' or 'short'],
      ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If an identifier greater than 3 (three) characters is entered, or the cabinet entered is not a digit (number), the following message will be displayed:

```
Identifier invalid
```

If the carrier entered is invalid, the following message will be displayed:

```
Invalid carrier specified
```

If the cabinet entered is not within the valid range of cabinets or the cabinet is not administered, the following message will be displayed:

```
Cabinet number not assigned
```

If there is no tone/clock board at the specified location, one of the following messages will be displayed:

```
Board not inserted
Board not assigned
```

If the specified cabinet carrier location is that of a switch node, the following message will be displayed:

```
Switch Node carrier specified; invalid command for SN carrier
```

If the cabinet carrier location entered is that of an EPN that is not available, the following message will be displayed:

```
EPN is not available
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy; Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The tone clock circuit pack maintenance object will only display the cabinet-carrier location.
Maintenance Name	The maintenance objects being tested is TONE-BD, TONE-PT and TDM-CLK.
Alt. Name	Not applicable.

Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test tone-clock 1a".

```
test tone-clock 1a


                           TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  01A     TONE-BD                     46       PASS
  01A     TONE-BD                     52       PASS
  01A     TONE-PT                     40       PASS
  01A     TONE-PT                     41       PASS
  01A     TDM-CLK                     148      PASS
  01A     TDM-CLK                     149      PASS
  01A     TDM-CLK                     150      PASS
  01A     TDM-CLK                     151      PASS
  01A     TDM-CLK                     574      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test trunk

This command will test an entire trunk group or a specific trunk group member.

SYNOPSIS

test trunk group number*/member number [short | long][repeat number | clear] schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, cust, init.

EXAMPLES

test trunk 78 l
test trunk 80/1 sh r 2
test trunk 78/2 l r 25
test trunk 78/2 l r 25 schedule
test trunk 80
test trunk 80 schedule
test trunk 78 r 4
test trunk 78 c

DESCRIPTION

The test trunk command performs hardware diagnostic tests on an entire trunk group or an individual trunk group member, depending on the options entered by the technician.

Defaults

The default for the command is short with the repeat of 1.

Parameters

group number	The group number is an administered number associated with each trunk group (1-99).
member number	The member number is an administered number identifying a particular trunk within a trunk group (1-99).
short	This will cause the command to execute a series of nondestructive diagnostic tests.
long	This will execute a more comprehensive and longer version of the diagnostic tests. This may involve both destructive and nondestructive tests.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
clear	This option causes the test sequence (short or long) to repeat until the alarm (if one exists against the maintenance object) is cleared or a single test in the sequence fails. If no alarms are registered against the maintenance object then the test sequence will be exercised only once. The long clear option forces a clear of all alarms if no errors are encountered during testing. The short clear option only clears alarms pertinent to tests in the short sequence.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test trunk" the following message will be displayed:

```
Enter group # or group #/member #, ['long' or 'short'],
     ['repeat' (1-100) or 'clear'], ['schedule']
```

Error Messages

If the format for the trunk location is incorrect, the following error message would be displayed:

```
Format invalid
```

If the trunk group or member range is invalid, the following message will be displayed:

```
Trunk or trunk group invalid
```

If a software fault is encountered while the command is executing, the following message will be displayed:

```
Error encountered, can't complete request
```

If the trunk group is not administered, the following message will be displayed:

```
Group not assigned, or group assigned but with no member
```

If the trunk group member is not administered, the following message will be displayed:

```
Group member not assigned
```

If there are no tests found for this maintenance object, the following message will be displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address (cabinet-carrier-slot-circuit) of the maintenance object that is being tested.
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	The alternate means of identifying the maintenance object. This field contains xxx/yyy when the object is a trunk, where xxx is the trunk group number and yyy is the member number. It contains P/xxx when the object is a private CO line, where xxx is the private CO line group number.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED."
Error Code	A system-generated number that tells why the release failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO.

For the following output example, assume that the command that was entered was "test trunk 78".

```
test trunk 78


                            TEST RESULTS

  Port      Maintenance Name  Alt. Name Test No. Result       Error Code
  01C1505   CO-TRK            078/001   3        PASS
  01C1505   CO-TRK            078/001   36       PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

None.

test tsc-administered

This command performs switched services request to run a heartbeat test on any type of administered Temporary Signaling Connection (TSC).

SYNOPSIS

test tsc-administered signaling group number/*tsc index repeat number schedule*

PERMISSIONS

The following default logins may execute this command: system technician, inads, init.

EXAMPLES

test tsc-administered 1
test tsc-administered 1/1 repeat 2
test tsc-administered 1/2 schedule

DESCRIPTION

The test tsc-administered command runs a switched services request to run the TSC heartbeat test is for administered Temporary Signaling Connection's (TSCs) on a signaling group.

Defaults

The default for the command is a repeat of 1.

Parameters

signaling group number	An administered number associated with each signaling group (1-8).
tsc index	A number associated with each TSC in a signaling group.
repeat number	The "number" specifies how many times each test in the sequence is to be repeated. "Number" may be any integer between 1 and 100.
schedule	When the "schedule" option is specified, the command is validated and then a scheduling form is displayed to allow the technician to schedule execution of the command. The command is then placed in the command queue and is executed at the specified time. The information displayed by the command is sent to the system printer instead of the screen. Refer to the Report Scheduler and System Printer feature specification [1] for more details.

Help Messages

If the system technician presses HELP after entering "test tsc-administered" the following message will be displayed:

```
Enter group # (1-8) or group #, [/tsc index (1-64)],
          ['repeat' (1-100)], ['schedule']
```

Error Messages

If the format for the specified signaling group or the signaling group and TSC is incorrect, the following message is displayed:

```
Format invalid
```

If the specified signaling group number is out of range, the following message is displayed:

```
Signaling group invalid
```

If the specified signaling group is not administered, the following message is displayed:

```
No signaling group assigned
```

If the specified signaling group has no TSC assigned or the specified TSC is unadministered, the following message is displayed:

```
No TSC assigned
```

If the specified TSC number is out of range, the following message is displayed:

```
Tsc index invalid
```

If the software data cannot be sent to the SAT, the following message is displayed:

```
Error encountered, can't complete request
```

If no tests can be found for the associated MO, the following message is displayed:

```
No tests for this MO
```

If the command entered is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

If during the execution of a command a resource problem occurs that requires the user to restart the command, then the following message will be displayed:

```
Command resources busy;
Press CANCEL to clear, and then resubmit
```

If all of the available maintenance resources are currently in use, then the following message will be displayed:

```
All maintenance resources busy; try again later
```

OUTPUT

The responses will be displayed on a test-by-test basis with one line of data displayed for each test result.

Port	The port address of the administered temporary signaling connection that is being tested (signaling group no/tsc index).
Maintenance Name	The type of maintenance object that is being tested.
Alt. Name	Not applicable.
Test No	The actual test that is being executed.
Result	The result of the individual test -"PASS," "ABORT," "FAIL," "NO BOARD," "DISABLED," "EXTRA BD."
Error Code	A system-generated number that tells why the test failed or aborted. A detailed list of the codes according to "Test No." is provided for each MO (for example, see MO section "TSC-ADM (Administered Temporary Signaling Connections)").

For the following output example, the command that was entered was "test tsc-administered 1/1".

```
test tsc-administered 1/1


                             TEST RESULTS

  Port    Maintenance Name  Alt. Name Test No. Result       Error Code
  1/1     TSC-ADM                     604      PASS


Command Successfully Completed
```

FEATURE INTERACTIONS

Additional data is available after running the test. See the status tsc-administered command for details on how to access the additional data.

upgrade software

This command allows the software text image, the flash component of the LMM firmware (386 only), the MTP firmware (386 only), the Packet Control (PACCON) and the Processor Interface (PI) firmwares to be upgraded. Save translation must be done before this command.

NOTE:
For more information about software upgrades prior to DEFINITY DCS Release 5 see "Software Upgrade" in Chapter 5, "Routine Maintenance Procedures". For upgrading a Release 5 System see "Software Upgrade" in Chapter 5, "Routine Maintenance Procedures".

SYNOPSIS

Simplex/Duplex[1]

upgrade software

PERMISSIONS

The following logins may execute this command: system technician, inads, init.

EXAMPLES

Simplex/Duplex

upgrade software

DESCRIPTION

Simplex

386 Only

The command verifies that a software card-mem is present and then, if present, proceeds to reprogram the flash memory and perform a level-4 restart. During the restart of the system, the system technician is prompted to replace the software card-mem with the translation card-mem. Service is provided upon completion of the system restart. Service down time is between 5 to 12 minutes.

1. In this context, *simplex* is equivalent to the *stand reliability option*
In this context, *duplex* is equivalent to the high reliability option or *critical reliability option*.

286 Only

This command invokes a level-4 restart on the system. As the core image is read from the tape with the new software, the system is upgraded to the new software. Service is provided upon completion of the system restart. Service down time is between 10 to 20 minutes.

Duplex

386 Only

The command verifies that a software card-mem is present in the standby SPE, programs the flash memory, resets the standby SPE, and prompt the system technician to replace the software card-mem with the translation card-mem as in the simplex case. An interchange of SPE's is performed upon completion of a successful standby upgrade. At the same time, the old active SPE is upgraded automatically with the new software through similar swapping of card-mems. The service disruption is between 1 to 4 minutes, which is less disruptive than the simplex case.

286 Only

This command invokes a level-4 restart on the standby SPE which reads in the core image from the tape containing the new software. Upon successful completion of the restart, an SPE-interchange occurs. The standby SPE becomes the active SPE and performs a level-2 restart. The new standby SPE is upgraded when the new active SPE enables memory shadowing 10 minutes after the upgrade. The service disruption is between 5 to 10 minutes, which is less disruptive than the simplex case.

Defaults

None.

Parameters

None.

Help Messages

If the system technician presses HELP after entering "upgrade software," the following message is displayed:

```
Entry is not required
```

386 Only

If no card-mem is loaded into the system, the following message will be displayed:

```
Software card-mem is not inserted in the system
```

If a wrong card-mem is loaded into the system, the following message will be displayed:

```
Incorrect card-mem loaded; insert software card-mem
```

If the directory information on the software card-mem is corrupted or the card-mem is not formatted properly, the following message will be displayed:

```
Software card-mem not readable; try another card-mem
```

286 Only

If the cancel key is depressed when the command is executed in a duplex system, the following message will be displayed:

```
This command may not be canceled
```

Both 386 and 286

If this command is in conflict with another currently executing command, then a message will be displayed showing the login id of the conflicting user and the conflicting command. The message is as follows:

```
'login id':'command' has a command conflict
```

386 Only

If the checksum on the software card-mem is bad, the following message will be displayed:

```
Bad checksum on software card-mem; try another card-mem
```

If the software upgrade failed in the standby SPE, the following message will be displayed:

```
No response on upgrade status from standby SPE, command failed
```

If the software card-mem in the standby SPE is not replaced with a translation card-mem within 2 minutes, the following message will be displayed:

```
No translation card-mem inserted
in the standby SPE, command aborted
```

If the flash text checksum failed after the standby upgrade, the following message will be displayed:

```
Standby SPE text checksum failed, command aborted
```

If the software card-mem is not inserted in the active SPE within 2 minutes after the prompting string: "REPLACE TRANSLATION CARD-MEM ON <active carrier> WITH SOFTWARE CARD-MEM," the command has to be retried again and the following message will be displayed:

```
No software card-mem inserted in active SPE; command aborted
```

If the SPE-select switches are thrown to prevent the SPE-interchange during a software upgrade, the following message is displayed:

```
SPE select switches thrown; upgrade complete only on standby
```

Both 386 and 286

If the standby SPE is not in the standby mode and is busy running tests, the following message will be displayed:

```
Standby SPE busy with another task;
for information use 'status system'
```

If the standby SPE has not completed initialization, the following message will be displayed:

```
Standby SPE memory not refreshed; Use 'refresh spe-standby'
```

If the active SPE cannot communicate with the standby SPE after the standby SPE is properly upgraded, the following message will be displayed:

```
Upgrade failed; no communication with
  standby after new software booted
```

If the SPE-interchange failed and the new software cannot be run in the active SPE, the following message is displayed:

```
Software upgrade failed, could not perform an interchange
```

OUTPUT

386 Only

The following is the output of a successful simplex upgrade upon entering the "upgrade software" command:

```
 INITIATING SOFTWARE UPGRADE
 MEM-CARD CHECKSUMPASSED
REPROGRAMMING MTPPASSED
ERASING MEMORYPASSED
REPROGRAMMING SPEPASSED
FLASH TEXT CHECKSUM       PASSED
 UPGRADE COMPLETE
 <beep>
 REPLACE SOFTWARE MEM-CARD WITH TRANSLATION MEM-CARD
 <beep>
```

Explanations and error recoveries to the above steps are as follows:

INITIATING SOFTWARE UPGRADE:	This indicates that the system is proceeding to do a software upgrade.
MEM-CARD CHECKSUM:	If the card-mem checksum fails, the system will reboot without performing an upgrade. Retry the command with another software card-mem.
REPROGRAMMING MTP:	If the MTP programming fails, the Manager I will not be functional anymore. So the rest of the upgrade (if it occurs) will not be visible. Nor will the MTP be present to monitor the health of the 386. The only recovery procedure is to power down and power up the system since the presence of a software card-mem will cause a software upgrade.
ERASING MEMORY:	The rest of the memory is being erased.
REPROGRAMMING SPE:	This shows the status of the reprogramming. A total of 7 Mbytes has to be reprogrammed. If the reprogramming fails in the midst of upgrade, it will take the system into *SPE-down* mode. In this mode, the system technician can only reset the system or display alarms. The system should be reset, and another upgrade attempt will be done due to the detection of a software card-mem in the system.
FLASH TEXT CHECKSUM:	If the checksum fails, the software may or may not be healthy. But it will try to run for as long as it can until further system reset due to escalation or system technician intervention.
REPLACE SOFTWARE MEM-CARD WITH TRANSLATION MEM-CARD:	The system technician is prompted by a beep and this text string on the Manager I to replace the software card-mem with the translation card-mem. The system will boot without translation if the replacement is not done within 2 minutes. The only way to recover from this is to replace the card-mem and issue a *reset system 3* to read in the translations again.
UPGRADE COMPLETE:	This indicates that the software upgrade is completed.

286 Only

The following is displayed when the "upgrade software" command is entered:

```
LMM VERSION 7.2.0
ROM CHECKSUM TEST ( = DF22)       PASSED
DUAL PORT RAM TEST                PASSED
SOFT INT TEST                     PASSED
NMI TEST                          PASSED
READ_WRITE MEMORY                 PASSED
MEMORY BOARD 1 DATA BIT TEST      PASSED
MEMORY BOARD 1 CHECK BIT TEST     PASSED
MEMORY BOARD 1 MEE SING BIT TEST  PASSED
MEMORY BOARD 1 MEE DOUB BIT TEST  PASSED
MEMORY BOARD 2 DATA BIT TEST      PASSED
MEMORY BOARD 2 CHECK BIT TEST     PASSED
MEMORY BOARD 2 MEE SING BIT TEST  PASSED
MEMORY BOARD 2 MEE DOUB BIT TEST  PASSED
MEMORY FUNCTIONAL TEST            PASSED
TAPE DIAGNOSTIC                   PASSED
READING TAPE IMAGE                PASSED
RAM CHECKSUM TEST ( = A545)       PASSED
RAM CHECKSUM DATA ( = A4C0)       PASSED
RESET 4 (REBOOT) PERFORMED
```

Duplex:

The following is the output of a successful duplex upgrade upon entering the "upgrade software" command (assume that carrier A is active):

```
TN786 CLMM Release 1.9.0
INITIATING SOFTWARE UPGRADE
MEM-CARD CHECKSUM           PASSED
REPROGRAMMING MTP           PASSED
REPROGRAMMING SPE           PASSED
FLASH TEXT CHECKSUM         PASSED
REPLACE SOFTWARE MEM-CARD ON B WITH TRANSLATION MEM-CARD
UPGRADE COMPLETE
REPLACE TRANSLATION MEM-CARD ON A WITH SOFTWARE MEM-CARD
TN786 CLMM Release 1.9.0
INITIATING SOFTWARE UPGRADE
MEM-CARD CHECKSUM           PASSED
REPROGRAMMING MTP           PASSED
REPROGRAMMING SPE           PASSED
FLASH TEXT CHECKSUM         PASSED
REPLACE SOFTWARE MEM-CARD ON A WITH TRANSLATION MEM-CARD
UPGRADE COMPLETE
```

NOTE:
Carrier A is assumed to be active.

Explanations and error recoveries to the above steps are as follows:

INITIATING SOFTWARE UPGRADE:	This indicates that the system is proceeding to do a software upgrade.

REPROGRAMMING MTP:	If the standby MTP programming fails, Manager I screen updates will be gone even though upgrade may continue. The active SPE will finally reset the screen (about 15 minutes) and the upgrade is considered failed.
ERASING MEMORY:	The rest of the standby memory is being erased.
REPROGRAMMING SPE:	This shows the status of the reprogramming. A total of 7 Mbytes has to be reprogrammed. If the reprogramming fails in the midst of upgrade, it will take the standby SPE into *SPE-down* mode. The display of the failed upgrade will remain until the active SPE resets the screen again (takes about 15 minutes). The upgrade attempt has to be retry.
FLASH TEXT CHECKSUM:	If the standby checksum fails, the standby SPE will run unpredictably. The active SPE will eventually take over the Manager I screen (about 15 minutes) and the upgrade is failed.
REPLACE SOFTWARE MEM-CARD ON B WITH TRANSLATION MEM-CARD:	The system technician is prompted by a beep and this text string on the Manager I to replace the standby software card-mem with the translation card-mem. If the card-mem is not replaced within 2 minutes, the standby SPE will go into SPE-down mode. Retry command again.
REPLACE TRANSLATION MEM-CARD ON A WITH SOFTWARE MEM-CARD:	The system technician is prompted by a beep and this text string on the Manager I to replace the translation card-mem with the software card-mem on the active SPE. If this step is not done, the SPE-interchange will not happen. A major alarm will be raise against the standby SPE as it has different software now.
REPLACE SOFTWARE MEM-CARD ON A WITH TRANSLATION MEM-CARD:	The system prompts the system technician to replace the software card-mem with the translation card-mem in the new standby SPE. Failure to replace the card-mem will cause the standby to boot up with no translation, but the active's translation will be shadowed over when shadowing is enabled.
UPGRADE COMPLETE:	The upgrade for the new standby SPE is completed.

286 Only

No output is displayed when the standby SPE is upgraded. The following output is displayed when the level-2 SPE-interchange occurs:

```
READ_WRITE MEMORY              PASSED
RAM CHECKSUM TEXT ( = A545)    PASSED
ROM CHECKSUM TEST ( = DF22)    PASSED
DUAL PORT RAM TEST             PASSED
SOFT INT TEST                  PASSED
NMI TEST                       PASSED
RESET 2 (COLD_2) PERFORMED
```

FEATURE INTERACTIONS

System Restarts

An upgrade will cause a system restart. Simplex systems will result in a level-4 restart. Duplex system will undergo a level-2 SPE-interchange after the standby is upgraded through a level-4 restart.

Initcauses

Executing "display initcauses" will show that software upgrade and the level of system reset being done.

Multi-user Contention

When this command is executing, all other maintenance commands will be blocked. Exceptions to these are most of the status or display type commands. All administrations commands are not blocked. It is the user's responsibility to make sure that no new translations are added between the last save translation operation and the completion of the *upgrade software* command.

Recent Change History Log

The *upgrade software* command will not be logged for both simplex and duplex systems. This is due to the clearing of memory during the level 4 reset.

Periodic and Scheduled Maintenance

Periodic and scheduled maintenance will be suspended while the upgrade command is executing.

Error and Alarm Log

Error and alarm logs before the software upgrade will be lost.

Demand Busyout Objects

Maintenance objects that have been demand busyout will be released when the processor reboots or interchanges during the software upgrade. If the command is cancelled before the actual reboot or interchange starts, then all demand busyout objects status will be preserved.

Standby SPE Maintenance

Data consistency alarms will be generated if the software in the active and standby are not consistent.

Disabled Objects

All disabled objects retain their "disabled" status after a software upgrade according to status recorded in the last successful *save translation* command.

Remote Software Upgrade

In a tape-base system, after the system technician has gone on-site to replace the tapes, the upgrade can be performed later remotely. This is not possible in a flash system.

Delayed/Automatic Upgrade

In a tape-based system, it is possible to install in the new tapes and have the system do an upgrade the next time the system does a *reset system 4*. This is not possible in the flash system.

Maintenance Object Repair Procedures

11

General

Trouble-clearing is based on the type of indication received, system-alarmed troubles, or user-reported troubles. When viewing the Alarm Log, all major alarms are displayed first, minor alarms are displayed second, and warning alarms are displayed last. Each level of alarm is displayed by importance of functional area. The first alarmed entry should be resolved first because it may be affecting the rest of the alarmed entries.

Sometimes system-alarmed and user-reported troubles exist at the same time. The alarmed troubles should always be cleared first, if possible. This often clears the user-reported faults without additional maintenance.

Port Troubles

Failures in trunk and station circuit packs in the port carriers and in the port slots of the control carrier(s) are the easiest to repair. Failures are usually independent and can be cleared by replacing the circuit pack with the red alarm LED or on-board alarm in the Error Log. It is desirable to wait until the amber (busy) LED is off before removing the pack, if possible. However, during moderate to heavy system activity, at least one station or trunk is usually busy.

There is an alternative to replacing a port circuit pack that has only one (or a few) failed port(s). The voice terminal or trunk assigned to the failed port can be moved to a good port on the same or another port pack. If this is done, the wiring must also be changed at the cross-connect field (see *DEFINITY Communications System Generic 1 and Generic 3i Wiring*, 555-204-111, for cross-connect field wiring information). This method should be done only to improve the system temporarily until a new circuit pack is obtained.

This is an administrative rather than a maintenance procedure and should be done by the System Manager. The new port must be compatible with the trunk or voice terminal. System records should be updated to identify the defective port so that it is not used again. Packs with more than two or three defective ports should *always* be replaced.

Common Control Troubles

The circuit packs in the SPE(s) of the control carrier(s) A (and B) are more difficult to repair. For systems not equipped with High or Critical Reliability, the system must be powered down before any of these packs are replaced. After the suspect circuit pack has been replaced, the system is powered up (rebooted). For High or Critical Reliability Systems, refer to Chapter 8, "Reliability Systems: A Maintenance Aid".

Another factor increasing the difficulty of trouble-clearing in the SPE is the high degree of interaction among the circuit packs. Multiple alarms and off-board alarms are more likely to occur in common control troubles than in port troubles. Use of the Alarm Log and the List of Alarms is often necessary when clearing problems.

For more detailed information on repairing Common Control circuit packs, refer to the "XXX-BD (Common Port Circuit Pack)" maintenance procedure near the end of this chapter.

Voice Terminal and Trunk Troubles

If the system isolates a fault to a voice terminal or if a user complaint indicates a voice terminal problem, the trouble must be isolated to the voice terminal itself or to the wiring between the cabinet and the voice terminal. Tests for checking wiring and voice terminal performance can be generated at the administration terminal and at designated voice terminals.

WARNING:
A visual inspection of voice terminal wiring, particularly the mounting cord, is always advisable in case of voice terminal trouble reports. A dead voice terminal can be the result of a loose mounting cord. Voice terminal trouble can also occur when wiring is crushed or severed by furniture or traffic.

Trunk problems, reported by alarms or by users, can be evaluated through tests from voice terminals or the administration terminal. If trunk troubles appear to be outside the system, the responsible common carrier should be asked to make the repairs.

Error Generation/Tracking

Errors may be detected by periodic maintenance tests run on an MO or by using the MO (for example, placing a phone call or saving translations). These errors are reported to the maintenance subsystem and logged in the Error Log which then causes initial testing to begin on the MO.

All types of errors logged against an MO are kept in a maintenance record for that MO. This record is created when the first error is reported and remains active until maintenance determines that the problem no longer exists. A counter is kept for each type of error, and each time the error recurs the associated counter is increased.

Each error and test counter is assigned a threshold value. Accelerated testing begins when the counter becomes "Active." In general, alarms are raised only by test failures; in-line errors, in most cases, do not raise alarms. An alarm is not resolved until **all** tests have passed and all alarming counters go to 0. Also, the maintenance record is active until all counters are reduced to 0.

Error/Alarm Resolution

The same tests that run automatically are also available to the technician, and the results of these system technician-demanded tests affect the error counters in the same way. Thus, if an alarm is raised by a transient problem that is no longer active, the alarm can be resolved quickly running the appropriate tests the correct number of times.

Maintenance Object Test/Repair Procedures

The rest of this chapter contains information required for accurate interpretation of the Alarm Log, efficient maintenance testing, and speedy repair of alarmed MOs. The following details are provided for each MO, if applicable:

- Release number that MO description applies to (includes Domestic or International releases; for example, "International G1.2SE")
- Alarm level(s)
- Hardware error(s) associated with the MO
- The associated test that caused the error(s)
- Test sequences
- Test description(s)
- Error code description(s)
- Recommended maintenance procedures

NOTE:
Some test commands may trigger test sequences for more than one MO.

For your convenience, the MOs have been arranged alphabetically by their Alarm Log names. The only exception is XXX-BD which is a set of common tests used by certain circuit packs that share the generic hardware that interfaces with the TDM Bus. The circuit packs included in the XXX-BD category are listed in the beginning of the "XXX-BD (Common Port Circuit Pack)" Maintenance documentation section.

12V-PWR (12 Volt Power Supply)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
12V-PWR	MINOR	test card-mem sh	12 Volt Power Supply
12V-PWR	WARNING	test card-mem sh	12 Volt Power Supply

The 12 Volt Power Supply unit in the TN777B NETCON circuit pack is required for programming flash memory devices in circuit packs such as the TN786B or TN790 Processor circuit pack and the removable memory card inserted into the TN777B NETCON circuit pack. During the erase and write operations of a flash memory or of a memory card, the 12 volt power supply must be turned on under the instruction of software. For the read-only operation of a flash memory or of a memory card, the 12 volt power supply is not required. The maintenance strategy for the 12 volt power supply is to ensure that the power supply is functional as designed.

If the 12 volt power supply cannot be turned on, all the erase and write operations to a flash device fail. Features such as "save translation," "save announcements," "system upgrade," "hard patching," and "core dump" always fail in this case.

Hardware Error Log Entries and Test to Clear Values

12 Volt Power Supply Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test card-mem
1(a)	Any	12 Volt Power Supply Test (#701)	MINOR	ON	test card-mem
257(b)	Any	12 Volt Power Supply Test (#701)	WARNING	ON	test card-mem

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. Software cannot turn on the 12 volt power supply to provide 12 volt power to the flash memory or to the memory card.

b. Software can turn on the 12 volt power supply, and 12 volt power is available. However, the software cannot turn the power supply off after operations are completed. The 12 volt power remains on. This error does not affect the normal operations involved in accessing the memory or the memory card.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table that follows when you are inspecting errors in the system. By clearing error codes associated with the *12 Volt Power Supply Test* for example, you may also clear errors generated from other tests in the testing sequence. The 12 Volt Power Supply Test can be initiated via either the **test card-mem** command or the **test network-control** command.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
12 Volt Power Supply Test (#701)	X	X		ND
Memory Card Insertion Test (#695) (a)	X	X		ND
Memory Card Format and Read Test (#696) (a)	X	X		ND
Memory Card Match Test (#697) (a)	X	X		ND
Memory Card Write-Protected Test (#698) (a)	X	X		ND
Memory Card Directory Recovery Test (#699) (a)	X	X		ND
Memory Card Translation Data Integrity Test (#694) (a)		X		ND
Memory Card Erase/Write/Read Test (#693) (a)		X		ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to "CARD-MEM (Memory Card)" Maintenance documentation for a description of this test.

12 Volt Power Supply Test (#701)

This test is a nondestructive test. The purpose of the test is to diagnose the 12 volt power supply unit in the TN777B NETCON circuit pack. No erase and write-to-memory operations are started or verified during the test. The contents of flash memory and of the memory card should not be changed.

The test turns on the power supply, and it verifies that 12 volt power appears by reading the control register in the TN777B NETCON circuit pack. After the power supply is turned on, the maintenance software waits for three seconds before verifying the appearance of 12 volt power. After the 12 volt power supply can be turned on and verified, the test turns the power supply off and then verifies that the power is off. The control register in the TN777B NETCON circuit pack is read again for the verification.

If, while this test is running, an application attempts to erase or write a flash memory or a memory card, this test remains active, and the application is barred.

Table 11-1. 12 Volt Power Supply Test

Error Code	Test Result	Description/ Recommendation
1192	ABORT	12 volt power supply is being used by other applications or by maintenance. 1. The 12 volt power supply is in use. Retry the **test card-mem** command after the maintenance operation application is completed.
2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.

Continued on next page

Table 11-1. 12 Volt Power Supply Test — *Continued*

Error Code	Test Result	Description/ Recommendation
109	FAIL	The 12 volt power supply unit in the TN777B NETCON circuit pack cannot be turned on by the software. 1. Retry the **test card-mem** command one more time to verify the operation of the 12 volt power supply in the TN777B NETCON circuit pack. 2. If the failure indicated by Error Code 109 persists, the TN777B NETCON circuit pack must be replaced with a new circuit pack. Follow the standard procedure for replacing the NETCON circuit pack from the SPE control carrier. 3. After the new TN777B circuit pack is inserted, enter the **test card-mem** command to verify the operations of the 12 volt power supply in the TN777B NETCON circuit pack. The alarm is resolved after the test passes twice. 4. If the failure persists even after a new NETCON circuit pack is inserted, escalate the problem.
110	FAIL	The 12 volt power supply unit in the TN777B NETCON circuit pack cannot be turned off by the software. 1. Retry the **test card-mem** command one more time to verify the operation of the 12 volt power supply in the TN777B NETCON circuit pack. 2. If the failure indicated by Error Code 110 persists, the TN777B NETCON circuit pack should be scheduled for replacement during the next regular maintenance visit. This failure does not cause any service disruption.
	PASS	The 12 volt power supply unit in the TN777B NETCON circuit pack is functioning correctly.

ABRI-PORT (ASAI ISDN-BRI Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ABRI-PORT[2]	MAJOR(b)	test port PCSSpp l	ASAI ISDN-BRI Port
ABRI-PORT	MINOR	test port PCSSpp l	ASAI ISDN-BRI Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

2 The alarm level for ABRI ports may be administered using the **set options** command. The alarm level can be set independently for Off-Board and On-Board alarms to MAJOR for all ABRI ports in the system.

Refer to "BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port)" Maintenance documentation for repair procedures.

AC-POWER (AC Power) for AC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
AC-POWER	WARNING	test environment P	AC Power

1 Where P is an appropriate port network number determined via the PORT field from the Alarm or Error Log.

DEFINITY Generic 1 offers two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, PPN or EPN cabinet configuration aspects in a High or Critical Reliabilty system are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate section(s).

- For a single-carrier cabinet system, refer to the DC-POWER (DC Power) Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for AC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems", or "POWER (Battery & Battery Charger) for AC-Powered Systems".
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for DC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for DC-Powered Systems", or "POWER (Battery & Battery Charger) for DC-Powered Systems".

The AC Power MO represents the AC power provided to the switch from a wall outlet in a multicarrier cabinet system. The AC power comes from the wall outlet, through the Power Distribution Unit (PDU), and is then distributed to the various Carrier Port Power Units. The Battery Charger monitors AC power via fuse F5. Figure 11-1 illustrates the relation of fuse F5 to the rest of the system (Figure 11-1 also shows other environment maintenance-related items that can be ignored for this section on AC Power). Figure 11-2 illustrates the fuse arrangement in a Small Cabinet (from a System 75 R1V3 upgrade). In a Small Cabinet, fuse F3 plays the role fuse F5 plays in the multicarrier cabinet system. Figure 11-3 shows the position of the fuses on the PDU and describes how to replace a fuse. When the switch loses power (for example, a power outage in the building), a Major alarm is logged against AC Power and the system goes on battery backup, which is known as Nominal Power Holdover (NPH). If power is restored before the NPH time expires, the alarm is resolved. Each multicarrier cabinet port network has separate batteries for NPH. The nominal power holdover provided is as follows:

- In a multicarrier cabinet PPN in a system without High or Critical Reliability, the battery supplies 10 seconds of power to the PPN cabinet and then an additional 10 minutes of power to just the control carrier in the PPN. The administration terminal is logged off. In this case, the system software does the timing.
- In a multicarrier cabinet PPN in a High or Critical Reliability system, the battery supplies five seconds of power to the PPN cabinet and then an additional five minutes of power to just the two control carriers in the PPN. In this case, the system software does the timing.
- In an EPN, the battery supplies 15 seconds of power to the EPN cabinet and no partial holdover. In this case, the EPN Maintenance circuit pack does the timing.

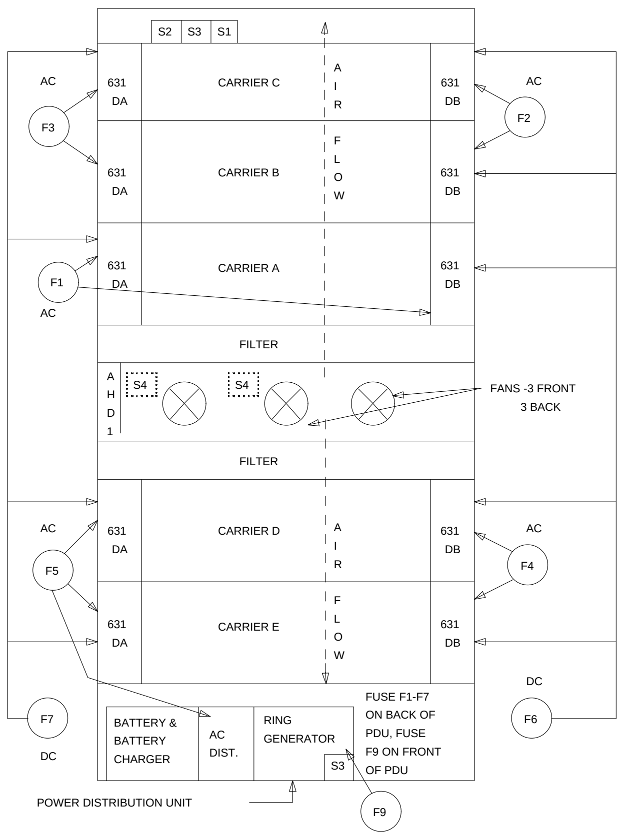

Figure 11-1. Multicarrier Cabinet Environment Components (AC-POWER)

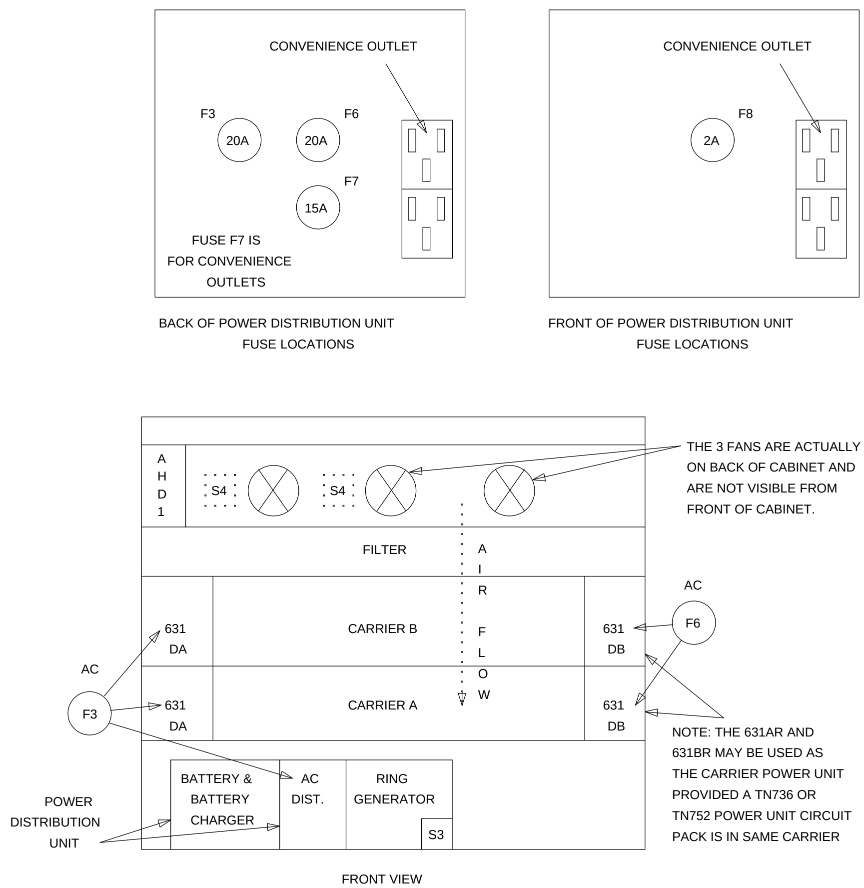

Figure 11-2. Small Cabinet Environment Components (AC-POWER)

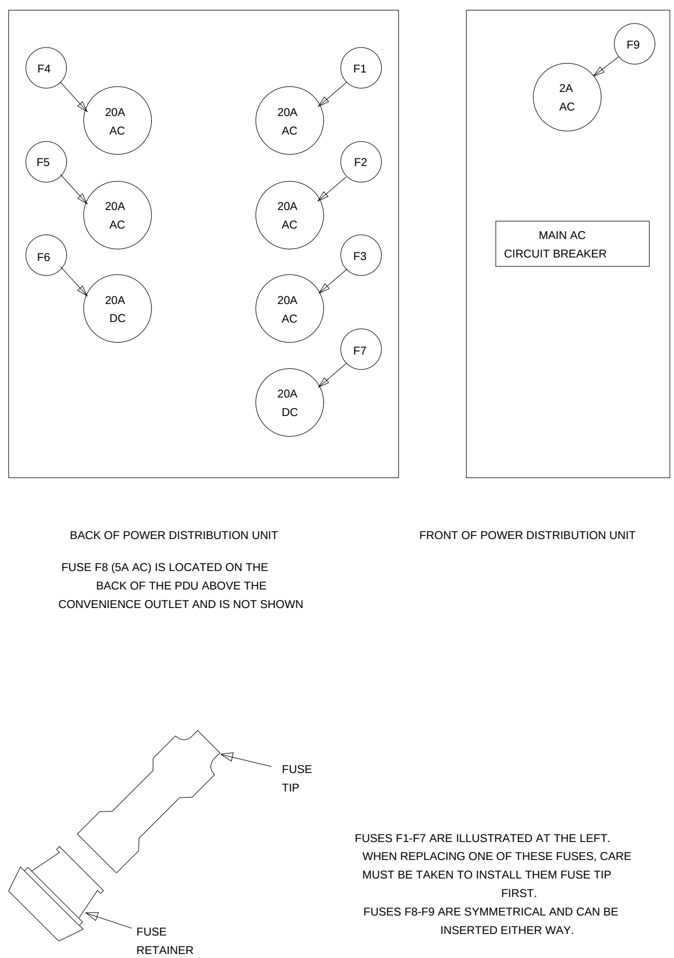

Figure 11-3. Multicarrier Cabinet Fuse Location and Replacement

Hardware Error Log Entries and Test to Clear Values

AC Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
513	Any	AC Power Query Test (#78)	WARNING	OFF	test environment P sh r 1

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence.

Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *AC Power Query Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78)	X	X	ND
Power Unit Query Test (carrier E) (#127) (b)	X	X	ND
Power Unit Query Test (carrier D) (#127) (b)	X	X	ND
Power Unit Query Test (carrier A) (#127) (b)	X	X	ND
Power Unit Query Test (carrier B) (#127) (b)	X	X	ND
Power Unit Query Test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Temperature Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to "POWER (Battery & Battery Charger) for AC-Powered Systems" Maintenance documentation for a description of this test.

b. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for a description of this test.

c. Refer to "EMG-XFER (Emergency Transfer)" Maintenance documentation for a description of this test.

d. Refer to "CABINET (Cabinet Sensors)" Maintenance documentation for a description of this test.

e. Refer to "EXT-DEV ADMIN? N (External Device Alarm)" or "EXT-DEV ADMIN? Y (External Device Alarm)" Maintenance documentation for a description of this test.

f. Refer to "RING-GEN (Analog Ring Generator)" Maintenance documentation for a description of this test.

NOTE:
This test only shows up in the test sequence if there is a TN768 or TN780 Tone-Clock circuit pack in the port network being tested.

AC Power Query Test (#78)

This test queries the Maintenance/Tape Processor in a PPN in a system without High or Critical Reliability, the Duplication Interface circuit pack in a High or Critical Reliability system PPN, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of AC power to the switch.

Table 11-2. TEST #78 AC Power Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Then, repeat the test. 3. If the test continues to ABORT with a 2000 Error Code, check for and resolve all DUPINT (Duplication Interface) errors in a High or Critical Reliability system PPN, PR-MAINT (Maintenance/Tape Processor) errors in a standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 4. If the test continues to ABORT with a 2000 Error Code, then escalate the problem.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-2. TEST #78 AC Power Query Test — *Continued*

Error Code	Test Result	Description / Recommendation
1	FAIL	**NOTE:** For a Global AC MCC (J58890CH) use the procedures outlined in step 2. The switch is currently without AC power. **WARNING:** *Turn off power to the 397C Battery Chrger before removing Fuse F5.* 1. Check for AC at the wall outlet. a. If there is no AC power at the wall outlet, then the problem is not with the system itself. Power must be restored to the wall outlet. b. If there is AC power at the wall outlet, then there could be a problem with the Battery or Battery chargers. Resolve all alarms logged against POWER (Battery & Battery Charger), and rerun the test. If the test still fails, the fuse F5 may have blown (See the above WARNING before removing Fuse F5). Replace fuse F5 (see Figure 11-3), and rerun the test. If the test still fails, then the PR-MAINT (Maintenance/Tape Processor) in a PPN in a system without High or Critical Reliability, the DUPINT (Duplication Interface) circuit pack in a High or Critical Reliability system PPN, or the EPN MAINT (Maintenance) circuit pack in an EPN multicarrier cabinet system may be incorrectly reporting the problem. Resolve all

Continued on next page

Table 11-2. TEST #78 AC Power Query Test — *Continued*

Error Code	Test Result	Description / Recommendation
1 *(cont'd.)*	FAIL	c. alarms against these MOs, and rerun the test. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that **are not** detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, then escalate the problem. 2. Procedures for a Global MCC (J58890CH): a. For a nominal holdover system if there is no AC power at the wall outlet, then the problem is not with the system itself. Power must be restored to the wall outlet. For a Extended Power System follow normal escalation procedures b. If there is AC power at the wall outlet, then there could be a problem with the Rectifiers (RM850), Battery Interface Unit, or battery. Resolve all alarms logged against the POWER Maintenance Object, and rerun the test. If the test still fails, the BIU may be defective. Check to see if the BOD alarm LED is "on", on the BIU. If the BOD LED is "on" replace the Battery Interface Unit (BIU). If the BOD LED is "off" and the BOK LED is "on" then the SYSAM or the EPN Maintenance circuit pack may be incorrectly reporting the problem. Resolve all alarms against these Maintenance Objects and rerun the test. c. If the test still fails, then follow normal escalation procedures

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Table 11-2. TEST #78 AC Power Query Test — *Continued*

Error Code	Test Result	Description / Recommendation
100	FAIL	The switch is currently without AC power, and AC Power maintenance is in the middle of timing the NPH interval. 1. Follow the repair steps outlined above for Error Code 1.
	PASS	The PR-MAINT (Maintenance/Tape Processor) in a PPN in a system without High or Critical Reliability, the DUPINT (Duplication Interface) circuit pack in a High or Critical Reliability system PPN, or the EPN MAINT (Maintenance) circuit pack in an EPN multicarrier cabinet system has reported that the switch has AC power. If there is no AC power at the wall outlet, then look for and resolve all alarms against the appropriate MO listed.

AC-POWER (AC Power) for DC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
AC-POWER	WARNING	test environment P	AC Power

1 Where P is an appropriate port network number determined via the PORT field from the Alarm or Error Log.

DEFINITY Generic 1 offers two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, the PPN or EPN cabinet configuration aspects in a High or Critical Reliability system are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate section(s).

- For a single-carrier cabinet system, refer to the "DC-POWER (Single-Carrier Cabinet Power)" Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for AC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems", or "POWER (Battery & Battery Charger) for AC-Powered Systems".
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for AC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems", or "POWER (Battery & Battery Charger) for AC-Powered Systems".

In a DC-powered multicarrier cabinet system, the AC-POWER maintenance object still exists, but serves no functional purpose. Because the system cannot determine the type of powering provided, all AC-POWER tests should always either pass or abort.

Hardware Error Log Entries and Test to Clear Values

AC Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
513	Any	AC Power Query Test (#78)	WARNING	OFF	test environment P sh r 1

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *AC Power Query Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78)	X	X	ND
Power Unit Query Test (carrier E) (#127) (b)	X	X	ND
Power Unit Query Test (carrier D) (#127) (b)	X	X	ND
Power Unit Query Test (carrier A) (#127) (b)	X	X	ND
Power Unit Query Test (carrier B) (#127) (b)	X	X	ND
Power Unit Query Test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Temperature Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to "POWER (Battery & Battery Charger) for AC-Powered Systems" Maintenance documentation for a description of this test.

b. Refer to "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems" Maintenance documentation for a description of this test.

c. Refer to "EMG-XFER (Emergency Transfer)" Maintenance documentation for a description of this test.
d. Refer to "CABINET (Cabinet Sensors)" Maintenance documentation for a description of this test.
e. Refer to "EXT-DEV ADMIN? N (External Device Alarm)" or "EXT-DEV ADMIN? Y (External Device Alarm)" Maintenance documentation for a description of this test.
f. Refer to "RING-GEN (Analog Ring Generator)" Maintenance documentation for a description of this test.

AC Power Query Test (#78)

This test queries the Maintenance/Tape Processor in a PPN in a system without High or Critical Reliability, the Duplication Interface circuit pack in a High or Critical Reliability system PPN, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of AC power to the switch. In a DC-powered system, this test should never fail.

Table 11-3. TEST #78 AC Power Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
any	FAIL	The Maintenance/Tape Processor in a PPN in a system without High or Critical Reliability, the Duplication Interface circuit pack in a High or Critical Reliability system PPN, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system is incorrectly reporting a problem with AC power. If this test fails, the problem is with the circuit pack and not with AC-POWER. The suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, then follow normal escalation procedures.
	PASS	All that can be inferred is that the PR-MAINT (Maintenance/Tape Processor) in a PPN in a system without High or Critical Reliability, the DUPINT (Duplication Interface) circuit pack in a High or Critical Reliability system PPN, or the EPN MAINT (Maintenance) circuit pack in an EPN multicarrier cabinet system is working properly.

ADM-CONN (Administered Connection)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADM-CONN	MAJOR	status administered-connection N	Administered Connection
ADM-CONN	MINOR	status administered-connection N	Administered Connection
ADM-CONN	WARNING	status administered-connection N	Administered Connection

1 Where N is an appropriate Administered Connection number determined via the PORT field from the Alarm or Error Log.

An Administered Connection (ADM-CONN) provides an end-to-end connection between two access endpoints or data-modules. This connection is automatically established whenever the Administered Connection is administered and the Administered Connection is due to be active. An error is logged whenever an Administered Connection cannot be established, either initially, on retry, fast retry, redial, or auto restoration, or whenever an established Administered Connection fails (including an Administered Connection that is subsequently reestablished via fast retry, redial, or auto restoration). An alarm is logged whenever an Administered Connection cannot initially be established or fails and cannot be reestablished. An administrable alarming strategy is supported on a per Administered Connection basis. An alarm is raised for an Administered Connection when either the number of consecutive failed attempts to establish the Administered Connection reaches the alarm threshold or it can be determined that a failed attempt to establish was due to an administered error (see note d). The alarm raised ("major," "minor," "warning," or "none") is specified in the "Alarm Type" field of the Administered Connection Administration Form.

Hardware Error Log Entries and Test to Clear Values

Table 11-4. Administered Connection Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0 (a)(b)(c)(k)	Any	None	Any	OFF	None
1 (a)(b)(c)(d)(e)	Any	None	Any	OFF	None
2 (a)(b)(c)(f)	Any	None	Any	OFF	None
6 (a)(b)(c)(g)	Any	None	Any	OFF	None
16 (a)(b)(c)(k)	Any	None	Any	OFF	None
17 (a)(c)(h)	Any	None	Any	OFF	None
18 (a)(b)(c)(i)	Any	None	Any	OFF	None
21 (a)(b)(c)(g)	Any	None	Any	OFF	None
22 (a)(b)(c)(d)(j)	Any	None	Any	OFF	None
28 (a)(b)(c)(d)(e)	Any	None	Any	OFF	None
29 (a)(b)(c)(k)	Any	None	Any	OFF	None
31 (a)(b)(c)(g)	Any	None	Any	OFF	None
34 (a)(b)(c)(l)	Any	None	Any	OFF	None
38 (a)(b)(c)(m)	Any	None	Any	OFF	None
40 (a)(b)(c)(l)	Any	None	Any	OFF	None
41 (a)(b)(c)(m)	Any	None	Any	OFF	None
42 (a)(b)(c)(l)	Any	None	Any	OFF	None
43 (a)(b)(c)(q)	Any	None	Any	OFF	None
44 (a)(b)(c)(l)	Any	None	Any	OFF	None
50 (a)(b)(c)(d)(n)	Any	None	Any	OFF	None
52 (a)(b)(c)(d)(o)	Any	None	Any	OFF	None
54 (a)(b)(c)(o)	Any	None	Any	OFF	None
58 (a)(b)(c)(l)	Any	None	Any	OFF	None
65 (a)(b)(c)(d)(p)	Any	None	Any	OFF	None
66 (a)(b)(c)(d)(p)	Any	None	Any	OFF	None

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Table 11-4. Administered Connection Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
69 (a)(b)(c)(d)(p)	Any	None	Any	OFF	None
81 (a)(b)(c)(q)	Any	None	Any	OFF	None
82 (a)(b)(c)(r)	Any	None	Any	OFF	None
88 (a)(b)(c)(d)(s)	Any	None	Any	OFF	None
91 (a)(b)(c)(q)	Any	None	Any	OFF	None
95 (a)(b)(c)(q)	Any	None	Any	OFF	None
96 (a)(b)(c)(q)	Any	None	Any	OFF	None
97 (a)(b)(c)(q)	Any	None	Any	OFF	None
98 (a)(b)(c)(q)	Any	None	Any	OFF	None
99 (a)(b)(c)(q)	Any	None	Any	OFF	None
100 (a)(b)(c)(q)	Any	None	Any	OFF	None
102 (a)(b)(c)(i)	Any	None	Any	OFF	None
111 (a)(b)(c)(q)	Any	None	Any	OFF	None
127 (a)(b)(c)(g)	Any	None	Any	OFF	None

a. These errors have no specific test associated with them. Refer to Notes b through s for an explanation and appropriate action.

b. These errors are valid only for Administered Connection established over ISDN facilities; only error 127 is valid for Administered Connection established over non-ISDN facilities (or between two endpoints on the same switch).

- Aux Data 1—Administered Connection establishment failed
- Aux Data 2—Active Administered Connection failed; attempting reestablishment via auto restoration
- Aux Data 3—Auto restoration failed
- Aux Data 4—Active Administered Connection failed; attempting reestablishment via fast retry
- Aux Data 5—Fast retry failed

c. **These errors are typically associated with administrative problems and are not expected to be of a temporary nature. Therefore, the Administered Connection is not retried and the failure is alarmed immediately (that is, the alarm threshold specified by the customer is ignored).**

d. The address of the destination endpoint is: an unassigned number (1); has an invalid number format (28); or is restricted form terminating calls ("Access Denied") [due to COR (Class of Restriction)]. Verify that the destination address is correct and that the destination endpoint is administered. **The destination endpoint is not administered on the switch where this error is logged.**

e. A request has been made to use a transit network or common carrier that cannot be accessed. Check the routing pattern used by this Administered Connection and verify that the inter-exchange carrier specified is correct.

f. The exact failure cause is unknown or has been mapped to one of these values. If this is not a temporary condition, try reversing the direction of the Administered Connection (that is, originate the Administered Connection from the destination switch). This may yield another failure cause; if not, and if this condition persists, follow normal escalation procedures.

g. The destination endpoint is not available. Check the status of the destination endpoint (for example, by using the **status access-endpoint** or **status data-module** command) and verify that the endpoint is not busy or otherwise unavailable (for example, out-of-service). **The status for the destination endpoint is not available on the switch where this error is logged.**

h. This switch sent an ISDN message to another switch, which either did not respond (18) or did not respond within the allotted time (102). This could be due to link failure or congestion or outage at the other switch. If this is not a temporary condition, follow normal escalation procedures.

i. The address of the destination endpoint has changed. Verify that the new address is correct and change the Administered Connection accordingly. **The destination endpoint is not administered on the switch where this error is logged.**

j. If this is not a temporary condition, follow normal escalation procedures.

k. These errors indicate that a resource (for example, a circuit or bearer capability) required by the Administered Connection is not presently available. If this is not a temporary condition, follow normal escalation procedures.

l. A network failure (38) or temporary failure (41) has occurred. Error Log entries for other maintenance objects (for example, DS1-BD or ISDN-LNK) may indicate a local problem. If not, and if this condition persists, follow normal escalation procedures.

m. A request to use a network service has been denied because the service has not been purchased. Check the routing pattern used by this Administered Connection and verify that the service type is correct. If the service type appears correct, check with the customer or network provider or both to determine what services have been purchased by the customer.

n. These errors indicate that outgoing calls may be barred on the originating switch (52) or that incoming calls may be barred on the destination switch (54). To restore an Administered Connection failure, issue the **status administered connection** command for current Administered Connection state (observe the retry count). If the Administered Connection state is "failed," then verify and correct the Administered Connection Administration Form.

o. The requested bearer capability (65), channel type (66), or facility (69) is not implemented or is unknown to the network. Check the address of the destination endpoint and the routing pattern used by this Administered Connection, and verify that they are correct and available. If no problem is found, follow normal escalation procedures.

p. These errors indicate that an ISDN protocol error has occurred. If this is not a temporary condition, follow normal escalation procedures.

q. If this is not a temporary condition, follow normal escalation procedures.

r. The destination endpoint (or some intermediate facility) is not compatible with the originating endpoint. Check the BCC fields of the routing pattern used by this Administered Connection. Also, check whether or not the originating and destination endpoints are compatible (for example, the originating access endpoint is voice-grade data, and the destination access endpoint is 64k data).

ADX16D-B (16 Port AUDIX Digital Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADX16D-B	MINOR	test board UUCSS sh	AUDIX Circuit Pack
ADX16D-B	WARNING	test board UUCSS sh	AUDIX Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The ADX16D-B maintenance object represents a TN566/TN2169 Definity AUDIX circuit pack combination (sometimes called Embedded AUDIX) operating in 16 port mode digital (DP). For circuit-pack-level problems, see XXX-BD. Port-level maintenance is covered by ADX16D-P.

On G3rV1 systems, the TN566/TN2169 combination operating in control-link mode appear to the system as a TN746 Analog Line circuit pack with vintage greater than 50. The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADXCL-PT.

DEFINITY AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests described in this manual apply only to switch-side maintenance which tests circuit pack components related to the TDM bus interface. The AUDIX system has an extensive maintenance strategy of its own that is described in *DEFINITY AUDIX System Maintenance*, 585-300-110.

ADX16D -P (16-Port AUDIX Digital PORT)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADX16D-P	MIN	test port PCSSpp l	AUDIX 16-Port Digital
ADX16D-P	WRN	test port PCSSpp sh	AUDIX 16-Port Digital

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

When a call is not answered, it is transferred to AUDIX, which answers the call.

DEFINITY AUDIX is a full-service voice messaging system that allows both system users and outside callers to write, edit, send, and forward voice messages to other users. It resides on two circuit packs, the TN566 Multifunction Board (MFB) and the TN2169 (ALM) Alarm Board.

In 16-port digital port (DP) mode the TN566 circuit pack supports up to 16 voice ports, each port is equipped with a primary and secondary information channel. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADXCL-PT. On G3r V1 systems, TN566/TN2169 DEFINITY AUDIX circuit packs operating in control-link mode appear to the system as a TN746 Analog Line circuit pack with vintage greater than 50.

The tests described in this manual apply only to switch-side maintenance which tests circuit pack components related to the TDM bus interface. The AUDIX system has an extensive maintenance strategy of its own that is described in *DEFINITY AUDIX System Maintenance*, 585-300-110.

Due to its width, the TN566 circuit pack occupies a total of five adjacent slots. When used in a Gs and G3i, it occupies the slot on the backplane into which the MFB plugs: the three slots to the immediate left and one slot to the immediate right. When used in a G3vs, the TN566 occupies the slot on the backplane into which the MFB plugs, and three additional slots to the left.

CAUTION:
*DEFINITY AUDIX unlike some AUDIX systems is **not** an adjunct. Always shut down the AUDIX system before:*

- *Removing a TN566 or TN2169 DEFINITY AUDIX circuit pack.*
- *Recycle power to a carrier or cabinet containing DEFINITY AUDIX circuit packs.*
- *Remove power to a carrier or cabinet containing DEFINITY AUDIX circuit packs*

Shutting Down DEFINITY AUDIX

Always shut down the AUDIX system before removing the TN566/TN2169 or removing or recycling power to it.

1. When AUDIX is shut down, the LCD display on the faceplate will display `E_SHUT`, `M_SHUT` or `386_DEAD`.
2. If one of the above is not displayed, press the `BOOT/SHUTDOWN` button on the AUDIX faceplate and wait for `M_SHUT` to be displayed steadily. (The display will flash while the disk spins down).
3. You can now safely remove (or recycle power to) the AUDIX circuit packs.
4. To restart AUDIX from the `SHUT` service state, press the `BOOT/SHUTDOWN` button.

Hardware Error Log Entries and Test to Clear Values

16-Port AUDIX Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port UUCSSpp sh r 1
1 (a)	40987	None	WRN	OFF	
1 (b)	1 to 20	None	WRN	OFF	
15 (c)	Any	None			
18 (d)	0	busyout port UUCSSpp	WRN	OFF	release port UUCSSpp
23 (e)	0	None	WRN	OFF	
130 (f)		None	WRN	ON	test port UUCSSpp sh
257 (g)	40971	None			
513 (h)	Any	None			
1537 (i)	40968	None	WRN	OFF	
1793		Voice & Ctrl. Local Loop Test (#13)	MIN/WRN[2]	ON	test port UUCSSpp 1 r 3
2049		NPE Crosstalk Test (#9)	MIN/WRN[2]	ON	test port UUCSSpp 1 r 3
2305 (j)	40967	None			
3840 (k)	40965	None			
3840 (l)	41029	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. The user may experience a noisy port or link. This is a off-board problem that is detected by the port circuit. If this problem exists, replace the circuit pack (see the precaution at the beginning of this section). Once this problem is resolved, the alarm will be retired after a predetermined amount of time.

b. At least 15 off-board problems have been detected with the link to the voice port. When an error with the link is detected, an on-board counter is incremented.

   The user could experience a noisy port or link. This is an off-board problem that is detected by the port circuit. If this problem exists, replace the circuit pack (see precaution at the beginning of this section). Once the problem is resolved, the alarm is retired after a predetermined amount of time.

c. This is a internal type error that occurs when an audit request fails.

d. The port is busied-out by command. Use the **release port UUCSSpp** command to release the port.

e. The circuit pack in administered but not installed. The alarm will clear when a circuit pack is inserted into the assigned slot.

f. The circuit pack has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack (see the precaution at the beginning of this section).

g. Something is interfering with transmitting to the voice port. This is usually an on-board problem and can be ignored if no user complaints are received.

h. AUDIX is not available to the switch, possibly due to a busyout on the AUDIX system. To check out the AUDIX system, use the *DEFINITY AUDIX System Maintenance (AT&T 858-300-110)* document.

i. An in-line maintenance error has generated an off-board warning due to a problem with the link to a voice port. This problem can be ignored if no user complaints are received. If the problem persists, replace the circuit pack (see precaution at the beginning of this section). Once the circuit pack is replaced, the alarm will be retired after a certain period of time.

j. The link between the voice port and the circuit pack has been successfully reset. No craft action is required.

k. No voice ports are connected to the DEFINITY AUDIX circuit pack. No maintenance action is required.

l. The message buffer in the circuit pack is full.

NO-OP Tests

The maintenance strategy for DEFINITY AUDIX emulates the one for DIG-LINE. The tests listed below apply only to DIG-LINE and not to DEFINITY AUDIX and are referred to as *NO-OP* tests. NO-OP tests always return PASS. Users should ignore these tests.

- Electronic Power Feed Test (#11)
- Station Lamp Updates Test (#16)
- Station (Digital) Audits Test (#17)
- Digital Terminal Remote Loop Around Test (#1201)

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Battery Feed Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Voice and Control Channel Loop Around Test (#13)		X	ND
NPE Crosstalk Test (#9)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#9)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain and provides conference functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete. Crosstalk testing is performed on both the primary information channel (voice) and on the secondary information channel (data) associated with each DEFINITY AUDIX port. If this test fails on either channel, the voice port is taken out-of-service.

Table 11-5. TEST #9 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test 1. Check the port status. Use the **display port UUCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state of the port indicates that the port is unavailable for the test, wait until the port is idle and retry the test. 2. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-5. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-5. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	Test disabled via background testing. Use the **status station** command to determine when the voice port is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

Continued on next page

Table 11-5. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1, 2	FAIL	The Network Processing Element (NPE) of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. Failure code 1 indicates that the Crosstalk test failed on the primary channel. Failure code 2 indicates that the Crosstalk test failed on the secondary channel. 1. Replace the circuit pack (see precaution at the beginning of this section).
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test. 1. Check the port status. Use the **display port UUCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state of the port indicates that the port is unavailable for the test, wait until the port is idle and retry the test. 2. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

Voice and Control Channel Local Loop Test (#13)

This test checks the information and control channels between the Switch Processing Element (SPE) and the DENFINTY AUDIX port circuit. The SPE sends a message to loop around both the information and control channels for the port. The primary information (voice) channel loop back test is run first. This test is run by sending a digital count on the Tone-Clock circuit pack on the primary information channel time slot and receiving the same digital count with a general purpose Tone Detector.

The Control Channel Loop Around Test is performed while the primary information channel is still looped back. This test sends four different transparent patterns to the on-board microprocessor which loops them back. A data integrity test is made by checking the loop back pattern to the original pattern.

The Loop Around Test for the secondary information channel is then performed using the same process as the primary channel.

After the above tests are completed a Conference test is implemented for the primary information channel. This test is the same as Conference Test #6.

Only one value (Pass, Fail, or Abort) is generated as a result of the four tests. If any test fails or aborts, the sequence is stopped.

Table 11-6. TEST #13 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	The system resources required to run this test are not available. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-6. TEST #13 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port UUCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

Continued on next page

Table 11-6. TEST #13 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-6. TEST #13 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	Conference Test failed on the primary channel. In some cases users may not notice a disruption in service. In extreme cases, the conference feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of the port.
15	FAIL	The control channel between the processor and the DEFINITY AUDIX circuit pack is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port. This failure could also be disruptive to other use.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of the port.
None	FAIL	The test failed for reasons external to the DEFINITY AUDIX circuit pack. 1. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack by using the **test board UUCSS s** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack, and the Tone Detector circuit pack. 3. If the Tone Generator circuit pack and the Tone Detector circuit pack are functioning properly, and if the test still fails, replace the DEFINITY AUDIX circuit pack (see the precautions at the beginning of this section).
	PASS	Voice and Control Channel Local test passed. All channels are transmitting properly. 1. To be sure that this is not an intermittent problem, repeat the test up to 10 times to see if it will continues to pass. 2. If complaints still exist, examine the connections.

ADXCL-BD (AUDIX Control Link Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADXCL-BD	MIN	test board PCSS sh	AUDIX Control Link Circuit Pack
ADXCL-BD	WRN	test board PCSS sh	AUDIX Control Link Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or [G1.2, G3iV1.1-286, G3iV2-386] 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The maintenance strategy for DEFINITY AUDIX Analog or Control Link emulates the one for ANL-16-L. The few tests that apply only to ANL-16-L and not to DEFINITY AUDIX Control Link are listed below and are referred to as *NO-OP* tests. NO-OP tests always return PASS. Users should ignore this test.

- Neon Test (#220)

Refer to "XXX-BD (Common Port Circuit Pack)" Maintenance documentation for circuit pack level errors. See also "ADXCL-PT (16-Port AUDIX Analog Line/Control Link Mode)" Maintenance documentation for related port information.

NOTE:
For information on removing DEFINITY AUDIX Control Link circuit packs, refer to *DEFINITY AUDIX Maintenance, 585-300-110*. For information on installing DEFINITY AUDIX Control Link circuit packs, refer to *DEFINITY AUDIX System R2.0 Installation, 555-300-111*.

ADXCL-PT (16-Port AUDIX Analog Line/Control Link Mode)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADXCL-PT	MIN	test port PCSSpp l	16-Port AUDIX Analog Line/Control Link
ADXCL-PT	WRN	test port PCSSpp sh release station <ext>	16-Port AUDIX Analog Line/Control Link

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

When a call is not answered, it is transferred to AUDIX, which answers the call.

The DEFINITY AUDIX circuit pack is a port circuit pack that allows both system users and outside callers to write, edit, send, and forward voice messages to other users. This circuit pack can be administered to up to sixteen analog voice ports. Each of the sixteen ports can support one DEFINITY AUDIX voice port. Whenever AUDIX answers a call, it uses one of the available voice ports.

The circuit pack resides on the TN566 Multifunction Board (MFB).[1]

Due to its width, the TN566 circuit pack actually consumes a total of five adjacent slots: the slot on the backplane into which the MFB plugs, the three slots to the immediate left, and one slot to the immediate right.

NOTE:
DEFINITY AUDIX is **not** an adjunct.

Failures of the common ringing application circuitry are reported as part of the Common Port Circuit Pack errors (see errors 1281 and 1537 in the XXX-BD (Common Port Circuit Pack) Maintenance documentation).

1. In some earlier systems, DEFINITY AUDIX appears to the system as a TN746B 16-Port Analog Line circuit pack. In these systems, you need to check the vintage number and suffix of the circuit pack to determine if a TN746B circuit pack is really a DEFINITY AUDIX. For TN746B circuit pack, *if the vintage is greater than or equal to 50*, the circuit pack is actually DEFINITY AUDIX. Otherwise, the circuit pack is normal TN746B 16-Port Analog Line circuit pack.

Hardware Error Log Entries and Test to Clear Values

16-Port AUDIX Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40977	None			
18	0	busyout station <extension>	WRN	ON	release station <extension>
23(b)	0	None	WRN	OFF	
130(c)		None	WRN	ON	test port PCSSpp sh
257(d)	40973	None			
513(e)	Any	None			
1025(f)		Loop Around Test (#161)	MIN/WRN[2]	ON	test port PCSSpp l r 2
1281		Conference Test (#7)	MIN/WRN[2]	ON	test port PCSSpp l r 2
1537		NPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. This is an in-line error and can only be resolved over time. This indicates that no terminal equipment was present when ringing was attempted. Execute the short **test port PCSSpp** command.

b. The circuit pack has been logically administered but not physically installed. The alarm will be cleared when the circuit pack is installed.

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. This is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only one Analog circuit pack in the system has this problem, then replace the circuit pack. If only Analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If Analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

e. AUDIX is not available. Check the AUDIX system.

f. TDM BUS is out of Service.

NO-OP Tests

The maintenance strategy for DEFINITY AUDIX Analog or Control Link emulates the one for ANL-16-L. The few tests that apply only to ANL-16-L and not to DEFINITY AUDIX Control Link are listed below and are referred to as *NO-OP* tests. NO-OP tests always return PASS. Users should ignore these tests.

- Battery Feed Test (#35)
- Audits and Updates Test (#36)
- Station Present Test (#48)

NOTE:
Tests 36 and 48 ABORT when AUDIX is not running.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Battery Feed Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Loop Around Test (#161)		X	ND
Conference Test (#7)		X	ND
NPE Crosstalk Test (#6)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port’s NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-7. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-7. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-7. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	This condition indicates that the test is not applicable when the analog port is used in a combined modem pool. This error can be ignored.
1018	ABORT	Test disabled via administration. 1. To enable the test for the particular analog station being tested, enter the **change station <extension>** command and change the "Test?" field on the Station Form from "n" to "y."
2000	ABORT	Response to the test request was not received within the allowable time period.
2012	ABORT	System could not respond to this request.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-8. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-8. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. This only applies to analog stations. 1. To enable the test for the particular analog station being tested, enter the **change station <extension>** command and change the "Test?" field on the Station Form from "n" to "y."
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

Loop Around Test (#161)

Each Analog port consists of:

- an NPE for port connectivity and gain, and conferencing functionality

This test is designed to check the on-board transmission capabilities of the NPE on the analog port. A Tone Detector and a Tone Generator talk and listen on the same pair of time slots as the Analog Port. The Analog Port is then instructed to go into loop around mode (see the following below). The test passes if the signal measured by the Tone Detector is within acceptable limits. For the TN566, the gain has been artificially reduced to be within the tolerances required by the switch TONE LEVEL MEASUREMENTS.

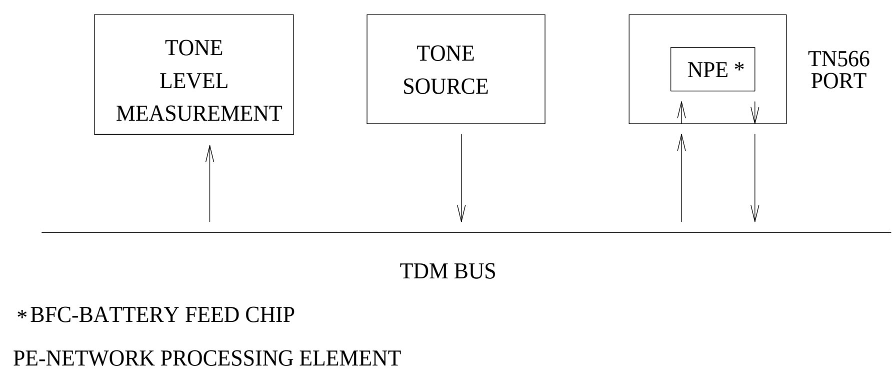

Figure 11-4. Analog Loop Around Test

Table 11-9. TEST #161 Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-9. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to the "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to the "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. To enable the test for the particular analog station being tested, enter the **change station <extension>** command and change the "Test?" field on the Station Form from "n" to "y."

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Table 11-9. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The reflective Loop Around Test failed. This causes noisy or unreliable connections or other users calling this port may hear an echo. 1. Replace the circuit pack.
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

ADXDP-BD (AUDIX Digital Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADXDP-BD	MIN	test board PCSS sh	AUDIX Digital Circuit Pack
ADXDP-BD	WRN	test board PCSS sh	AUDIX Digital Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or [G1.2, G3iV1.1-286, G3iV2-386] 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to "XXX-BD (Common Port Circuit Pack)" Maintenance documentation for circuit pack level errors. See also "ADXDP-PT (AUDIX Digital Port)" Maintenance documentation for related port information.

NOTE:
For information on removing DEFINITY AUDIX Digital circuit packs, refer to *DEFINITY AUDIX Maintenance, 585-300-110*. For information on installing DEFINITY AUDIX Digital circuit packs, refer to *DEFINITY AUDIX System R2.0 Installation, 555-300-111*.

ADXDP-PT (AUDIX Digital Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ADXDP-PT	MIN	test port PCSSpp l	AUDIX Digital Port
ADXDP-PT	WRN	test port PCSSpp sh	AUDIX Digital Port

1 Where P is the port network number (1 for PPN and 2 or [G1.2,G3iV1.1-286, G3iV2-386] 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

When a call is not answered, it is transferred to AUDIX, which answers the call.

The DEFINITY AUDIX circuit pack is a port circuit pack that allows both system users and outside callers to write, edit, send, and forward voice messages to other users. This circuit pack can be administered to up to eight voice ports in increments of two. The pack can support eight ports, with two logical information channels (primary information channel and secondary information channel) on each port. Each of the eight ports can support one DEFINITY AUDIX voice port. Whenever AUDIX answers a call, it uses one of the available voice ports.

The circuit pack resides on the TN566 Multifunction circuit pack (MFB).[2]

Due to its width, the TN566 circuit pack actually consumes a total of five adjacent slots: the slot on the backplane into which the MFB plugs, the three slots to the immediate left, and one slot to the immediate right.

NOTE:
DEFINITY AUDIX is **not** an adjunct.

Failures of the common ringing application circuitry are reported as part of the Common Port Circuit Pack errors (see error 1793 in the XXX-BD (Common Port Circuit Pack) Maintenance documentation).

2. In some earlier systems, DEFINITY AUDIX appears to the system as a TN746B 16-Port Analog Line circuit pack. In these systems, you need to check the vintage number and suffix of the circuit pack to determine if a TN746B circuit pack is really a DEFINITY AUDIX. For TN746B circuit pack, *if the vintage is greater than or equal to 50*, the circuit pack is actually DEFINITY AUDIX. Otherwise, the circuit pack is normal TN746B 16-Port Analog Line circuit pack.

Hardware Error Log Entries and Test to Clear Values

DEFINITY AUDIX Digital Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40987	None	WARNING	OFF	
1 (b)	1 to 20	None	WARNING	OFF	
15 (c)	Any	None			
18 (d)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
23 (e)	0	none	WRN	OFF	
130 (f)		None	WARNING	ON	test port PCSSpp sh
257 (g)	40971	None			
513 (h)	Any	None			
1537 (i)	40968	None	WARNING	OFF	
1793		Voice & Ctrl. Local Loop	MIN/WRN[2]	ON	test port PCSSpp l r 3
		Test (#13)			
2049		NPE Crosstalk Test (#9)	MIN/WRN[2]	ON	test port PCSSpp l r 3
2305 (j)	40967	None			
3840 (k)	40965	None			
3840 (l)	41029	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. The user may experience a noisy port or link. This is an off-board problem that is detected by the port circuit. If this problem exists, replace the circuit pack. Once the problem is resolved, the alarm is retired after a predetermined amount of time.

b. At least 15 off-board problems have been detected with the link to the voice port. When an error with the link is detected, an on-board counter is incremented.

The user could experience a noisy port or link. This is an off-board problem that is detected by the port circuit. If this problem exists, replace the circuit pack. Once the problem is resolved, the alarm is retired after a predetermined amount of time.

c. This is an internal type error that occurs when an audit request fails.

d. The port in question is busied out by maintenance personnel. Make sure that the port is released from busyout via the **release port PCSSpp** command.

e. The circuit pack has been logically administered but not physically installed. The alarm will be cleared when the circuit pack is installed.

f. The circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the AUDIX circuit pack.

g. There are problems transmitting to the voice port. This is usually an on-board problem, and it can be ignored if no user complaints are received.

h. AUDIX is not available. Check the AUDIX system. For Aux Data 0, tests 11, 16, and 17 fail with no error code.

i. An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice port. This can be ignored if no user complaints are received. If the problem persists, replace the circuit pack. Once the problem is resolved, the alarm is retired after a pre-determined amount of time.

j. The link between the circuit pack and the voice port is successfully reset. No system technician action is necessary.

k. No voice port is connected to the DEFINITY AUDIX circuit pack. No maintenance action is required.

l. The message buffer in the circuit pack is full.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *Voice and Control Channel Local Loop Around Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Voice and Control Channel Local Loop Around Test (#13)		X	ND
NPE Crosstalk Test (#9)		X	ND

1 D = Destructive; ND = Nondestructive

NO-OP Tests

The Maintenance Strategy for DEFINITY AUDIX emulates the one for DIG-LINE. The few tests that apply only to DIG-LINE and not to DEFINITY AUDIX are listed in the following table, and they are referred to as "NO-OP". NO-OP tests always return PASS, and users should ignore these tests.

NO-OP Tests for ADXDP-PT
Electronic Power Feed Test (#11)
Station Lamp Updates Test (#16)
Station (Digital) Audits Test (#17)

NOTE:
Tests 16 and 17 ABORT when AUDIX is not present.

NPE Crosstalk Test (#9)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and it provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and that it never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's Long Test Sequence, and it takes about 20 to 30 seconds to complete. Crosstalk testing is performed on both the primary information channel (voice) and on the secondary information channel (data) associated with each DEFINITY AUDIX port. If this test fails on either channel, the voice port is taken out-of-service.

Table 11-10. TEST #9 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test. 1. Check the port status. Use the **display port PCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for this test. You must wait until the port is idle. 2. If the port status is idle, retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2	ABORT	System resources may not have been available, or the port may have been busy during the test. 1. Check if port is being used. Retry the command after one minute. 2. If the test continues to abort after five attempts, escalate the problem.

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Table 11-10. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use. Use the **display port PCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors, and if it is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-10. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the command at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was put in use during the test. The test has been aborted. 1. Use the **display port PCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting.
1020	ABORT	Test disabled via background testing. Use the **status station** command to determine when the voice port is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-10. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1,2	FAIL	The Network Processing Element (NPE) of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. Error Code 1 indicates that the Crosstalk test failed on the primary channel. Error Code 2 indicates that the Crosstalk test failed on the secondary channel. 1. Replace the pack.
	PASS	The port is using its allocated time slots correctly. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times to make sure it continues to pass. 2. If complaints still exist, examine the connections.

Voice and Control Channel Local Loop Test (#13)

This test checks the information and control channels between the Switch Processing Element (SPE) and the DEFINITY AUDIX port circuit. The SPE sends a message to loop around both the information and control channels for the port. First, the primary information (voice) channel loop back test is run. The test is performed by sending a digital count from the Tone-Clock circuit pack on the primary information channel time slot and receiving the same digital count with a general purpose Tone Detector.

While the primary information channel is still looped around, the Control Channel Loop Around Test is performed. This test involves sending four different transparent patterns to the on-board microprocessor, receiving them back, and comparing them.

The Loop Around Test for the secondary information (data) channel is then performed. This test is the same as the primary information channel loop around test.

Next, a Conference Test is implemented for the primary information channel. This test is the same as Conference Test #6.

Only one value (Pass, Fail, or Abort) is generated as a result of the four tests run. If any test fails or aborts, the sequence is stopped.

Table 11-11. TEST #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-11. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use. Use the **display port PCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots that are out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors, and if it is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-11. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the command at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was put in use during the test. The test has been aborted. Use the **display port PCSSpp** to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-11. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Rerun the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
7	FAIL	Conference Test failed on the primary channel. In some cases, users may not notice a disruption in service. In extreme cases, the conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.
15	FAIL	The control channel between the processor and DEFINITY AUDIX circuit pack is not transmitting properly. User impact may range from noticing nothing to being unable to use the port. Could also be disruptive to other users.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port. 1. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack by using the **test board PCSS s** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and if the test still fails, replace the DEFINITY AUDIX circuit pack.
	PASS	Voice and Control Channel Local Loop test passed. All channels are transmitting properly. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times to make sure it continues to pass. 2. If complaints still exist, examine the connections.

NOTE:
For information on removing DEFINITY AUDIX circuit packs, refer to *DEFINITY AUDIX Maintenance,* 585-300-110. For information on installing DEFINITY AUDIX circuit packs, refer to *DEFINITY AUDIX System R1.0 Installation,* 555-300-111.

ALARM-PT (ALARM PORT)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ALARM-PT	MIN	test port UUCSSpp l	Alarm-Port
ALARM-PT	WRN	test port UUCSSpp sh	Alarm-Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The Alarm Port Maintenance Object provides on-board maintenance for an analog line port that is administered as an external device alarm port. Tests are provided to verify the analog line port's ability to detect an external device alarm. The External Device Alarm (EXT-DEV) Maintenance Object is used for the off-board external device alarm.

ANL-16-L (16-Port Neon Analog Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ANL-16-L	MIN	test port PCSSpp l	16-Port Neon Analog Line
ANL-16-L	WRN	test port PCSSpp sh release station <ext>	16-Port Neon Analog Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The following are 16-Port Analog Line circuit packs:

TN746	TN746B
TN468 [G3iV2-386]	TN749 [G3iV2-386]
TN468B [G3iV2-386]	TN2135 [G3iV2-386]
TN2144 [G3iV2-386]	TN2149 [G3iV2-386]

These circuit packs provide 16 ports for analog voice terminals. The TN746, TN468, and TN749 support only single-line, on-premises/in-building, analog voice terminals, and not off-premises stations, since these circuit packs are not equipped with lightning protection. The TN746B, TN2144, TN2149, and TN468B support both on-premises and off-premises (that is, out-of-building) analog voice terminals. The TN468, TN468B, TN479, TN2135, TN2144, and TN2149 do NOT support the neon message waiting feature.

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled via the **change station <extension>** command. However, on some releases of the software, this action disables Tests #6, #7, #161, and #35 as well as Test #48.

No maintenance of the terminal connected to the 16-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of the Common Port Circuit Pack errors (see errors 1281 and 1793 in the XXX-BD (Common Port Circuit Pack) Maintenance documentation).

Hardware Error Log Entries and Test to Clear Values

16-Port Neon Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40960 40977	none			
15 (b)	Any	Audits and Updates Test (#36)			
18	0	busyout station <extension>	WRN	ON	release station <extension>
130 (c)		None	WRN	ON	test port PCSSpp sh
257 (d)	40973	none			
513 (e)		Station Present Test (#48)	WRN	OFF	test port PCSSpp sh r 2
769		Battery Feed Test (#35)	MIN/WRN[2]	ON	test port PCSSpp sh r 2
1025		Loop Around Test (#161)	MIN/WRN[2]	ON	test port PCSSpp l r 2
1281		Conference Test (#7)	MIN/WRN[2]	ON	test port PCSSpp l r 2
1537		NPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. This is an in-line error and can only be resolved over time. This indicates that no terminal equipment was present when ringing was attempted. Execute the short **test port PCSSpp** command, and follow the procedure for the results of Test #48.

- 40960—indicates that too many simultaneous incoming ringing attempts were made on this board. Only four ports on a board may be ringing simultaneously. A fifth incoming call will cause an inline error from the board.

- 40977—indicates that no terminal equipment was connected when ringing was attempted. Run the short Test via the **test port PCSSpp** command, and follow the procedure for the results of Test #48.

b. This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate associated errors (if any).

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. This is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only one Analog circuit pack in the system has this problem, then replace the circuit pack. If only Analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If Analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

e. Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled using the **change station <extension>** command. However, on some releases of the software, this action disables Tests #6, #7, #161, and #35 as well as Test #48.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Battery Feed Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed Test (#35)	X	X	ND
Station Present Test (#48)	X	X	ND
Loop Around Test (#161)		X	ND
Conference Test (#7)		X	ND
NPE Crosstalk Test (#6)		X	ND
Station Status and Translation Audits and Updates Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-12. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-12. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-12. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold).
1018	ABORT	The test has been disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for a particular station being tested, enter **change station extension** and set the 'Test?' field on the station from 'n' to 'y.'
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-12. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Table 11-12. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-13. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-13. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold).
1018	ABORT	The test has been disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for the particular analog station being tested, enter **change station extension** and set the 'Test?' field on the station from 'n' to 'y.'

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Table 11-13. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT Maintenance documentation. 2. If there are no TONE-PT errors in the error log, retry the test at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. 1. Issue the **display port** and the **status station** commands to determine if the station is idle. If the station is found to be idle, issue the **test port** command for this port. 2. If the test continues to fail, issue the **busyout port** and the **release port** commands, and then retest the port. 3. If the test still fails, replace the board.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

Continued on next page

Table 11-13. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Battery Feed Test (also called Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery, and by trying to detect a current.

NOTE:
For the TN746B 16-Port Neon Analog Line circuit pack, Test #35 always "passes." No actual testing is performed on the TN746B while the test is running. Test #35 operates in the normal manner for TN746.

Table 11-14. TEST #35 Battery Feed Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-14. TEST #35 Battery Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold).
1018	ABORT	The test has been disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for the particular analog station being tested, enter **change station extension** and set the 'Test?' field on the station from 'n' to 'y.'
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-14. TEST #35 Battery Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This could be a marginal test, and the terminal equipment may be operating satisfactorily. 1. Retry the test at 1-minute intervals for a maximum of 5 times. 2. If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems.
	PASS	The port’s battery feed chip is able to provide power to the station equipment to detect on-/off-hook, but may not be able to supply power for touch-tones. If touch-tones are inoperative on this station, then replace the circuit pack because this port is inoperative. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Station Status and Translation Audits and Updates Test (#36)

This test updates the Analog port's message lamp state (if it has one) and translations (such as station type, dial type, network connection) with information kept in the software. The software is updated with the switchhook state reported by the port processor. When the ringer is in the off state, this test also turns off the station's ringer to prevent constant ringing caused by defective hardware.

Table 11-15. TEST #36 Station Status and Translation Audits and Updates Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold).

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Table 11-15. TEST #36 Station Status and Translation Audits and Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006	ABORT	This port has been busied out by command, or taken out-of-service by the failure of the NPE Crosstalk Test. 1. Look in the error log for error type 18 (port busied out) for this port. If this error is present, release the port with the **release station extension** command, and run the test again. 2. Look in the error log for error type 1025 (NPE crosstalk test failed) for this port. If this error is present, investigate the errors associated with the NPE Crosstalk Test 6. 3. Make sure that the terminal is connected and in service, and then retest. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed. The other updates were not performed because of this failure. This may occur when the audit is performed at the same time that the terminal equipment goes off-hook. Use the **status station** command to determine when the port is available for testing. 1. When the port becomes available for testing, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

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Table 11-15. TEST #36 Station Status and Translation Audits and Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5	FAIL	This does not indicate a hardware problem. However, there may be an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
7	FAIL	The translation update failed. This does not indicate a hardware problem. However, there may be an internal software error. The ringer update was not performed because of this failure.
8	FAIL	This does not indicate a hardware problem. However, there may be an internal software error. The ringer update failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Station Present Test (also called Ringing Application Test) (#48)

This test provides a burst of ringing current to the terminal equipment and detects that current flows. This test ascertains whether terminal equipment is connected to the port.

This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled using the Tests field of the station administration screen form. However, on some releases of the software, this action disables Tests #6, #7, #161, and #35 as well as Test #48.

Table 11-16. TEST #48 Station Present Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-16. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold).
1008	ABORT	Could not allocate a ringing circuit. Either all the ringing circuits are in use or the ringing generator is defective or it is not wired correctly. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is not wired correctly (see errors for RING-GEN). If it doesn't occur on other ports, then all four ring phases are in use.

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Table 11-16. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	The test has been disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the brief ringing disturbance that this test may cause). 1. To enable the test for the particular analog station being tested, enter **change station extension** and set the 'Test?' field on the station from 'n' to 'y.'
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment such as modems may fail even when connected properly. 1. Remotely test the equipment. 2. If the test fails again, look for RING-GEN errors in the error log. If present, refer to the RING-GEN (analog ring generator) Maintenance documentation. 3. Check all of the wiring between the station equipment and the switch. Then, run the test again. 4. If the test still fails, the set may be defective. Check the set, and replace it, if necessary. 5. Some terminal equipment could fail even when it is connected properly. If this is the case, disable the test using the **change station extension** command (enter 'n' into the Test field). Note that this action also disables tests 6, 7, 161, and 35 on this port.

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Table 11-16. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The station is connected properly to the switch. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Loop Around Test (#161)

Each Analog port consists of:

- an NPE for port connectivity and gain, and conferencing functionality
- a code that converts the digital signals of the TDM Bus to analog signals
- a battery feed chip that provides power to the telephone set for signaling, dial pulsing, transmission, and balance

This test is designed to check the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. A Tone Detector and a Tone Generator talk and listen on the same pair of time slots as the Analog Port. The Analog Port is then instructed to go into loop around mode (see the following below). The test passes if the signal measured by the Tone Detector is within acceptable limits.

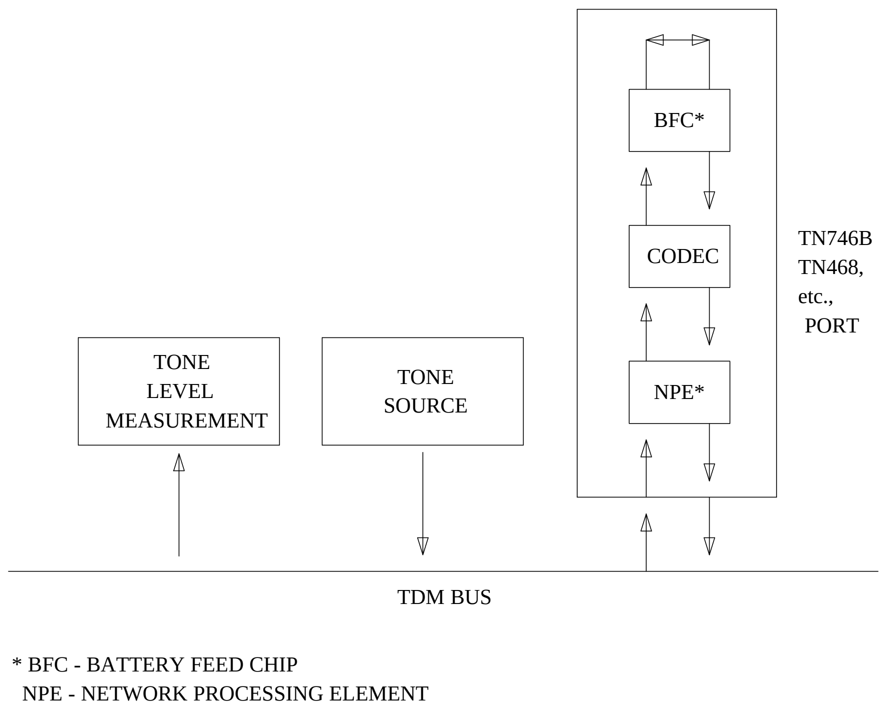

Figure 11-5. Analog Loop Around Test

Table 11-17. TEST #161 Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-17. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to the "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to the "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test is not run because the port is administered as either an External Alert or Announcement port.

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Table 11-17. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	The test has been disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for the particular analog station being tested, enter **change station extension** and set the ‘Test?’ field on the station from 'n' to 'y.'
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	The reflective loop around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board, as described below. 1. Since the test may be affected by a line seizure, repeat the test at 1-minute intervals for a maximum of 5 times. 2. Run circuit pack tests to check the tone generator circuit pack and the tone detector circuit pack by using the **test board UUCSS short** command. 3. Resolve any problems that are detected on the tone generator circuit pack or the tone detector circuit pack. 4. If the tone generator and tone detector circuit packs are functioning properly and the test still fails and a voice terminal is connected and wired properly, replace the analog line circuit pack.

Continued on next page

Table 11-17. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

ANL-BD (Analog Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ANL-BD	MIN	test board PCSS sh	8-Port Analog Line Circuit Pack
ANL-BD	WRN	test board PCSS sh	8-Port Analog Line Circuit Pack
ANL-BD	MIN	test board PCSS sh	8-Port Neon Analog Line Circuit Pack
ANL-BD	WRN	test board PCSS sh	8-Port Neon Analog Line Circuit Pack
ANL-BD	MIN	test board PCSS sh	16-Port Neon Analog Line Circuit Pack
ANL-BD	WRN	test board PCSS sh	16-Port Neon Analog Line Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or [G.1] 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to "XXX-BD (Common Port Circuit Pack)" Maintenance documentation for circuit pack level errors. See also "ANL-LINE (8-Port Analog Line), ANL-NE-L (8-Port Neon Analog Line)", and "ANL-16-L (16-Port Neon Analog Line)" Maintenance documentation for related line information.

ANL-LINE (8-Port Analog Line), ANL-NE-L (8-Port Neon Analog Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ANL-LINE	MIN	test port PCSSpp l	8-Port Analog Line
ANL-LINE	WRN	test port PCSSpp sh	8-Port Analog Line
ANL-NE-L	MIN	test port PCSSpp l	8-Port Neon Analog Line
ANL-NE-L	WRN	test port PCSSpp sh	8-Port Neon Analog Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The 8-Port Analog Line circuit packs are:

TN742	TN431 [G3iV2-386]
TN769	TN443 [G3iV2-386]
TN712	TN467 [G3iV2-386]
	TN411 [G3iV2-386]

These circuit packs provide eight ports for single line on-premises or off-premises analog endpoints such as analog voice terminals, queue warning level lamps, recorded announcements, dictation machines, PagePac™ paging equipment, external alerting devices, modems, facsimile machines, and AUDIX voice ports. The TN769 supports a neon message waiting lamp. The other eight-port analog lines do not support the lamp.

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled using the Tests field of the station administration screen. However, on some releases of the software, this action disables Tests #6, #47, and #35 as well as Test #48. Test #47 may cause a false alarm when the port is connected to off-premises equipment, some non-voice terminal equipment, and some loop equipment. If this is the case, then the test should be disabled using the Tests field of the **change station <extension>** command.

No maintenance of the terminal connected to the 8-Port Analog Line circuit pack or 8-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the neon message waiting lamp power (for ANL-NE-L only) and the common ringing application circuitry are reported as part of the Common Port Circuit Pack errors (see errors 1281 and 1793 in the XXX-BD (Common Port Circuit Pack) Maintenance documentation).

Hardware Error Log Entries and Test to Clear Values

8-Port Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40960 40975 40977	None			
15 (b)	Any	Audits and Updates Test (#36)			
18	0	busyout station <extension>	WRN	OFF	release station <extension>
130(c)		None	WRN	ON	test port PCSSpp sh
257 (d)		Station Present Test (#48)	WRN	OFF	test port PCSSpp sh r 3
513		Battery Feed Test (#35)	MIN/WRN[2]	ON	test port PCSSpp sh r 2
769 (e)		Loop Around and Conference Test(#47)			test port PCSSpp l r 3
1025		NPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 3
1281 (f)					
1793 (f)					

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major or Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. These are in-line errors and can only be resolved over time.

- 40960—indicates that too many simultaneous incoming ringing attempts were made on this board. Only four ports on a board may be ringing simultaneously. A fifth incoming call will cause an inline error from the board.

- 40975—indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal doesn't ring, then replace it. Otherwise, issue the **test port PCSSpp** command, and follow the procedure for Test #48.
- 40977—indicates that no terminal equipment was connected when ringing was attempted. Run the Short Test via the **test port PCSSpp** command, and follow the procedure for the results of Test #48.

b. This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate errors (if any).

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled via the **change station <extension>** command. However, on some releases of the software, this disables Tests #6, #47, and #35 as well as Test #48.

e. Test #47 may cause a false alarm when the port is connected to off-premises equipment, some non-voice terminal equipment, and some loop equipment. If this causes a false alarm, then disable the test by changing the Tests field of the **change station** command to "no."

f. Refer to "XXX-BD (Common Port Circuit Pack)" Maintenance documentation.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery Feed Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed Test (#35)	X	X	ND
Station Present Test (#48)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Loop Around and Conference Test (#47)		X	ND
Station Status and Translation Audits and Updates Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-18. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-18. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-18. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	The test was aborted due to a configuration problem. This code will result under either of the following conditions: 1. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). 2. The circuit pack is one of the following: — TN742 vintages 13,14 and 15 — TN769 vintages 3,4 and 5
1018	ABORT	Test disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for a particular station, enter **change station extension** and set the 'Test?' field on the 'Station Form' to 'y.'
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.

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Table 11-18. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a tone-clock problem). The tone-clock and tone detectors could be having a communication problem, for example, the companding modes could be out of synchronization. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-18. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for Analog circuit packs TN712 prior to Vintage 14 and TN742 prior to Vintage 4.

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Table 11-18. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Battery Feed Test (also called Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery, and trying to detect a current.

Table 11-19. TEST #35 Battery Feed Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-19. TEST #35 Battery Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This code will result under either of the following conditions: 1. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). 2. The circuit pack is one of the following: — TN742 vintages 13,14 and 15 — TN769 vintages 3,4 and 5
1018	ABORT	Test disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for a particular station, enter **change station extension** and set the 'Test?' field on the 'Station Form' to 'y.'

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Table 11-19. TEST #35 Battery Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a tone-clock problem). The tone-clock and tone detectors could be having a communication problem, for example, the companding modes could be out of synchronization. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This may occur when the test is performed at the same time that the terminal equipment goes off-hook. 1. Use **status station** to determine when the port is available for testing. When the port becomes available for testing, retry the command at 1-minute intervals a minimum of five times. 2. If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems. 3. If the test continues to fail, escalate the problem.

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Table 11-19. TEST #35 Battery Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port's battery feed chip is able to provide power to the station equipment to detect on-/off-hook. However, the battery feed chip may still be unable to provide power for touch-tones. If tones are heard when buttons are pressed, then the battery feed chip is functioning correctly; otherwise, replace the circuit pack because this port is defective. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for TN712 Analog circuit packs prior to Vintage 14 and TN742 prior to Vintage 6.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations (such as station type, dial type, network connection) with information kept in the software. The software is updated with the switchhook state reported by the port processor. When the ringer is in the off state, this test also turns off the station's ringer to prevent constant ringing caused by defective hardware.

Table 11-20. TEST #36 Station Status and Translation Audits and Updates Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This code will result under either of the following conditions: 1. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). 2. The circuit pack is one of the following: — TN742 vintages 13,14 and 15 — TN769 vintages 3,4 and 5

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Table 11-20. TEST #36 Station Status and Translation Audits and Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006	ABORT	This port has been busied out by command or taken out-of-service by the failure of the NPE Crosstalk Test. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, then release the port with the **release station extension** command and run the test again. 2. Look in the Error Log for Error Type 1025 (NPE Crosstalk Test failed) for this port. If this error is present, then investigate the errors associated with the NPE Crosstalk Test (#6) first. 3. Make sure that the terminal is connected and in service, and then retest. 4. If the test continues to abort, escalate the problem.
	ABORT	Could not allocate the necessary system resources to run this test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed, and the other updates were not performed because of this failure. This condition may occur when the audit is performed at the same time that the terminal equipment goes off-hook. Use the **status station** command to determine when the port is available for testing. 1. When the port becomes available for testing, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

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Table 11-20. TEST #36 Station Status and Translation Audits and Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5	FAIL	This does not indicate a hardware problem but may indicate an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
7	FAIL	The translation update failed. The ringer update was not performed because of this failure. This does not indicate a hardware problem but may be an internal software error.
8	FAIL	This does not indicate a hardware problem but may be an internal software error. The ringer update failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for TN712 Analog circuit packs prior to Vintage 14 and TN742 circuit packs prior to Vintage 6.

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Table 11-20. TEST #36 Station Status and Translation Audits and Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Loop Around and Conference Test (#47)

Each Analog Port consists of:

- an NPE for port connectivity and gain, and conferencing functionality
- a code that converts the digital signals of the TDM Bus to analog signals
- a battery feed chip that provides power to the telephone set for signaling, dial pulsing, transmission, and balance.

This test is designed to check the on-board transmission capabilities of the NPE, the code, and the battery feed chip of the Analog Port. A Tone Detector and a Tone Generator talk and listen on the same pair of time slots as the Analog Port. The Analog Port is then instructed to go into loop around mode (see Figure 11-5). The test passes if the signal measured by the Tone Detector is within acceptable limits.

The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. As part of Test #47, the operation of the port conference circuits in the NPE for three and four parties is also tested. In addition, a test is run to measure noise. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

The noise test is performed by filtering out the tone, and then measuring inherent port noise.

NOTE:
This Loop Around Test is sensitive to the length of the loop, the equipment in the loop, or the equipment terminating the loop, such as off-premises stations. If this test is causing a false alarm, then disable the test by changing the Tests field to "no" using the **change station** command for this station.

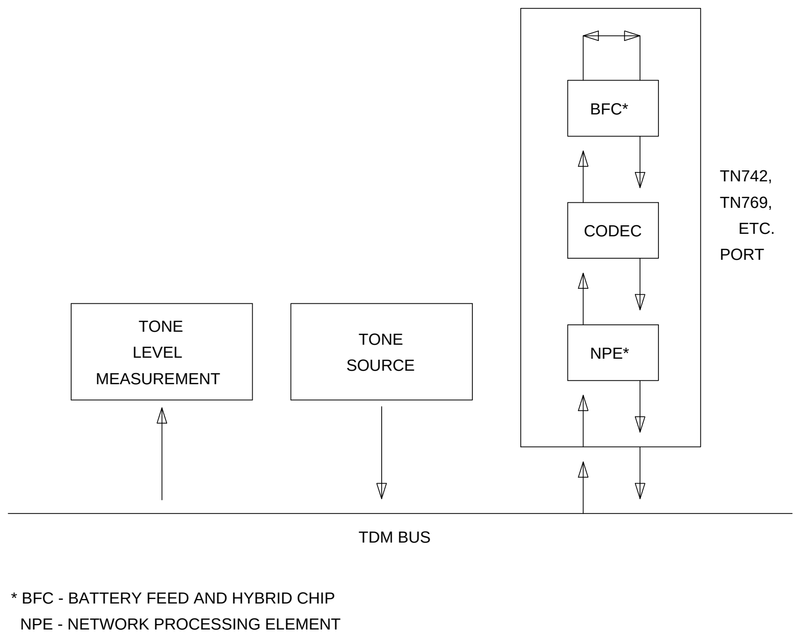

Figure 11-6. Analog Loop Around and Conference Test

Table 11-21. TEST #47 Loop Around and Conference Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	ABORT	The port was seized by a user for a valid call. 1. Enter **display port PCSSpp** to determine the station's extension. Enter **status station extension** to determine the service state of the port. If the port is in use, it will be unavailable for certain tests. Wait until the port is idle before retesting. 2. If the port is idle, retry the command at 1-minute intervals up to 5 times. 3. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. (This could be a Music-on-Hold port.) 1. Enter **display port PCSSpp** to determine the station's extension. Enter **status station extension** to determine the service state of the port. If the port is in use, it will be unavailable for certain tests. Wait until the port is idle before retesting. 2. If the port is idle, retry the command at 1-minute intervals up to 5 times. 3. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized for a valid call during the conference or noise test. Use the **status station** command to determine when the port is available for testing. 1. If the circuit pack is a TN742 with vintage 10 or less, this test is not valid. Otherwise, proceed with #2. 2. When the port is available for testing, retry the command at 1-minute intervals, a maximum of 5 times. 3. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This code will result under either of the following conditions: 1. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). 2. The circuit pack is one of the following: — TN742 vintages 13,14 and 15 — TN769 vintages 3,4 and 5

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	Test disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for a particular station, enter **change station** extension and set the ‘Test?’ field on the ‘Station Form’ to ‘y.’
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a tone-clock problem). The tone-clock and tone detectors could be having a communication problem, for example, the companding modes could be out of synchronization. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	The conference test or the noise test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board, as described below.
13		The reflective loop around with gain set to low and the 600-ohm balance failed. This will cause noisy or unreliable connections.
14		The reflective loop around test (with the gain set to high, using RC balance) failed. This could cause noisy or unreliable connections. The problem can also be off-board, as described below.
15		The nonreflective loop around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board, as described below.
		More information continues on the next page.

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7 13 14 15 *(cont'd.)*	FAIL *(cont'd.)*	1. Disconnect the terminal equipment from the circuit pack at the cross-connect and run the test again. 2. If the test fails again, replace the circuit pack and reconnect the terminal equipment. If the test passes the second time, then the test results were affected by the terminal equipment connected to the port; in this case, ignore the results of this test if all other tests pass or abort and the station is operating properly. Failure of test 47 does not cause an alarm. If there are failures of other tests, then investigate those errors. User reported troubles with this port should be investigated by using other port tests, by examining station wiring, and by examining the station to ensure that it is correctly translated as off-premises or on-premises. **NOTE:** If the loop around and conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test.

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Table 11-21. TEST #47 Loop Around and Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for TN712 Analog circuit packs prior to Vintage 14 and TN742 circuit packs prior to Vintage 6.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Station Present Test (also called Ringing Application Test) (#48)

This test provides a burst of ringing current to the terminal equipment and detects that current flows. This test is to ascertain whether or not terminal equipment is connected to the port.

This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled using the Tests field of the station administration screen. However, on some releases of the software, this action disables Tests #6, #47, and #35 as well as Test #48.

Table 11-22. TEST #48 Station Present Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** to determine the station’s extension. Enter **status station** extension to determine the service state of the port. If the port is in use, it will be unavailable for certain tests. Wait until the port is idle before retesting. 1. If the port is idle, retry the command at 1-minute intervals up to 5 times. 2. Check for phone left off-hook or for wiring problems. 3. If the test continues to abort, escalate the problem.

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Table 11-22. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This code will result under either of the following conditions: 1. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). 2. The circuit pack is one of the following: — TN742 vintages 13,14 and 15 — TN769 vintages 3,4 and 5

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Table 11-22. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1008	ABORT	Could not allocate a ringing circuit for one of the following reasons: ■ All the ringing circuits are in use, or ■ The ringing generator is defective, or ■ It is not wired correctly. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for Test #48 on other circuit packs as well, then the ringing generator may be defective or not wired correctly. If it does not occur on other ports, then that circuit pack is currently using all four ringing phases.
1018	ABORT	The test was disabled via administration. The default for the 'Test' field on the 'Station' form is 'y'; thus, you may want to determine why this field has been set to 'n' on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). 1. To enable the test for a particular station, enter **change station** extension and set the ‘Test?’ field on the ‘Station Form’ to ‘y.’
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a tone-clock problem). The tone-clock and tone detectors could be having a communication problem, for example, the companding modes could be out of synchronization. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-22. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The terminal equipment is not connected to the circuit pack or the ringing generator may have failed. 1. Remotely test the equipment. 2. If the test fails again, look for RING-GEN errors in the error log. If present, refer to the RING-GEN (analog ring generator) Maintenance documentation. 3. Check all of the wiring between the station equipment and the switch. Then, run the test again. 4. If the test still fails, the set may be defective. Check the set, and replace it, if necessary. 5. Some terminal equipment (such as a modem) could fail even when it is connected properly. If this is the case, disable the test using the **change station extension** command (enter 'n' into the 'Test' field). Note that this action also disables tests 6, 7, 161, and 35 on this port.
	PASS	The station is connected properly to the switch. This test may also pass if no terminal equipment is connected and the terminal is located far from the switch (that is, it is off-premises). User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for TN712 Analog circuit packs prior to Vintage 14 and TN742 circuit packs prior to Vintage 6.

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Table 11-22. TEST #48 Station Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

ANN-BD (Announcement Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ANN-BD	MINOR	test board PCSS l	Announcement Circuit Pack
ANN-BD	WRN	test board PCSS l	Announcement Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The TN750 Announcement circuit pack is a service circuit which provides a DEFINITY Generic 3 customer with an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (for example, announcements on hunt group calls). There are 16 Announcement Ports on the Announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. In addition to the 16 Announcement Ports, the Announcement circuit pack also has one Data Line Circuit Port (port 17). The Data Line Circuit Port is used for uploading/downloading the announcement memory to/from the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2]. If there are any errors associated with port 17, refer to "DAT-LINE (Data Line)" Maintenance documentation. If there are any errors associated with any other port, refer to "ANN-PT (Announcement Port)" Maintenance documentation.

NOTE:
TN750C is required if your system will have multiple announcement boards. To use multiple announcement boards, you must have G3V4 software, and at least one TN750C (up to ten are allowed). Only one TN750A/B may be present in the system when a TN750C is used. The announcements from a TN750A/B can be saved and restored to a TN750C — but once the announcements are recorded onto a TN750C, they are not backward compatible with the TN750A/B.

The Announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack and communicates with the switch via the control channel on the TDM Bus. The second processor, or Speech Processor (SP), controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels (one for each Announcement Port).

General Notes

Here are a few **very important** general notes that apply to any problem on the Announcement circuit pack. The user should read this before attempting to work on the TN750 Announcement circuit pack or Announcement Ports, **especially if the circuit pack needs to be replaced.**

1. The Announcement circuit pack retains all integrated announcements *as long as the circuit pack has power*. For this reason, whenever there is a problem with either the Announcement circuit pack or an Announcement Port that may require the circuit pack to be reset, it is always best to try to reset the circuit pack via the **reset board PCSS** command first. If that does not work, replace the circuit pack. **Announcements are preserved through a software reset, but they are lost when the circuit pack is reseated.**
2. **If a customer has announcements on the Announcement circuit pack that cannot be rerecorded easily, then announcements must be saved on the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] to ensure that they are not lost.** This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the circuit pack is in proper working order (see Note).

   NOTE:
   Unlike translations, announcements are NEVER automatically saved to the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2].

3. The administration terminal **save announcements** command replaces the announcement file on the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] the Announcement circuit pack speech memory. Care must be taken not to mistakenly enter this command and, as a result, destroy a valid file on the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2].
4. The **restore announcements** command replaces the Announcement circuit pack speech memory with the announcement file on the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2]. Care must be taken not to mistakenly enter this command, destroying valid speech memory (especially if the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] does not have a valid announcement file on it).
5. Whenever the Announcement circuit pack is replaced, announcements must always be rerecorded or downloaded to the new circuit pack. Otherwise, call processing is not able to use the pack.
6. If announcement speech memory is corrupted, announcements should not be saved [that is, if the Announcement Checksum Test (#209) fails, or if the speech sounds corrupted on playback]. This can ruin a good announcement file on the system tape [G3iV1.1-286] or memory card

[G3sV2, G3iV2-386, G3vsV2] and potentially cause errors/alarms on any circuit pack to which the new file is downloaded. However, if the customer does not have a valid announcement file on the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2], announcements can be saved in an effort to try to retain some of them (all of the announcements recorded may not be corrupted).

7. Due to a hardware fault in the TN750 announcement board, the following sequence of events my cause the announcement file to become corrupted and unusable:
   - Fill the board with recorded announcements.
   - Delete the last few announcements recorded.
   - Re-record the announcements deleted.

   If the announcement file becomes corrupted, the only solution is to re-record all announcements. To do this, follow these steps:

   a. Remove the announcement board.
   b. Remove the tape cartridge from the tape drive. Do this so that announcements are not automatically restored from tape.
   c. Re-insert the announcement board.
   d. Re-record all announcements.
   e. Insert the tape cartridge in the tape drive.
   f. Issue the save announcements command to save all the announcements on the tape.

   This hardware fault is fixed in the TN750B announcement board. However, the TN750B board will not automatically correct an announcement file which has previously been corrupted by a TN750 board. The only way to correct an announcement file corrupted by the TN750 board is to follow the steps above.

Announcement Administration

A brief description of the integrated announcement administration is given here to aid in troubleshooting the Announcement circuit pack and its ports. In many cases, it is necessary to record, play back, and/or delete announcements to resolve an alarm. It may also be necessary to save and restore announcements as part of the maintenance procedures. For a complete description of integrated announcement administration, please refer to the following manuals:

1. *DEFINITY Communications System Generic 3 Implementation*, 555-230-653
2. *DEFINITY Communications System Generic 1 and Generic 3 System Management*, 555-230-500

3. *DEFINITY Communications System Generic 3 V2 Traffic Reports*, 555-230-511
4. *DEFINITY Communications System Generic 1 and Generic 3 Voice Terminal Operations*, 555-230-701

Announcement Session

Announcements can be recorded, played back, and deleted from an announcement session. A station's COS needs to include console permissions in order for that station to be able to enter an announcement session. To enter an announcement session, go off-hook on a station that has console permissions and enter the appropriate Feature Access Code (FAC), administered as Announcement access code on the FACs form. Dial tone should be returned at this point. Enter the extension of the announcement that needs to be recorded, deleted, or played back. Again, dial tone should be heard. To record an announcement, press station keypad digit 1, record after the tone, and hang up when done. To play back an announcement, press 2. To delete an announcement, press 3 (confirmation tone is given if the delete worked). Announcements can also be played back by simply calling the announcement extension associated with them.

Uploading/Downloading Announcements

Integrated announcements on the TN750 Announcement circuit pack can be uploaded to the system tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] with the administration terminal **save announcements** command. Likewise, integrated announcements can be downloaded to the Announcement circuit pack with the **restore announcements** command. Both of these commands require a free data module of NETCON type to be administered, a data module of announcement type (on the Announcement circuit pack) to be administered, and a tape cartridge to be in the system's tape drive (must not be write-protected) or a memory card (must not be write-protected). These commands are useful in maintaining the customer's recorded announcements. Depending on system traffic, announcement uploads and/or downloads take between 30 and 45 minutes.

The system **automatically** tries to download the Announcement circuit pack five minutes after it is inserted. This automatic download procedure is aborted if:

1. An announcement is recorded within 10 minutes of circuit pack insertion.
2. An announcement download is invoked sooner with the administration terminal **restore announcements** command.
3. No announcement and/or NETCON data module is administered.
4. Either the announcement data module is busy or all the administered NETCON data modules are busy.

5. No tape [G3iV1.1-286] or memory card [G3sV2, G3iV2-386, G3vsV2] is in the system.
6. The tape or memory card in the system does not have a valid announcement file saved on it.

NOTE:
Unlike translations, there is no provision in the Generic 3 system for automatically saving announcements to the system tape or memory card.

Hardware Error Log Entries and Test to Clear Values

Table 11-23. Announcement Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level (See WARNING message below)	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS sh r 1
1(a)	0	Circuit pack removed or SAKI Test (#53)	MINOR	ON	
2(p)		None			
14(b)	1 to 64	Announcement Checksum Test (#209)			
18	0	busyout board PCSS	WARNING	OFF	release board PCSS
23(c)	0	None	WARNING	OFF	
125(d)		None	MINOR	ON	
170(e)	0	None	MINOR	ON	
217(f)	0	None	WARNING	OFF	
257	65535	Control Channel Test (#52)	MINOR	ON	test board PCSS l r 20
257(g)	Any	None			
267(f)	0	None	WARNING	OFF	
513(h)	Any	None			
1025(i)	4363	NPE Audit Test (#50)			test board PCSS l
1281(j)	17699	None			
1538(k)	Any	None	MINOR	ON	
1793		Angel-SP Handshake Test (#208)	MINOR	ON	test board PCSS l r 3
	17680	In-line Error			

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Table 11-23. Announcement Circuit Pack Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level (See WARNING message below)	On/Off Board	Test to Clear Value
2049(l) (m)		Clock Match Inquiry Test (#212)	MINOR	ON	test board PCSS sh r 3
	17674	In-line Error			
2305		140AY Loop Around Test (#210)	MINOR	ON	test board PCSS sh r 3
2561		Super Frame Match Inquiry Test (#211)	MINOR	ON	test board PCSS sh r 3
	17676	In-line Error			
2817(l)		Announcement Checksum Test (#209)	MINOR	ON	test board PCSS sh r 3
	17682	In-line Error			
	17699 (m)	In-line Error			
3840(n)	Any	None			
3999(o)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

WARNING:
All alarms are upgraded to MAJOR when the BASE Tone Generator is set to 12. (France).

Notes:

a. Error Type 1— This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

NOTE:
The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, follow the instructions for "Red (alarm)" in the "Control and Port Circuit Pack Status LEDs" section in Chapter 7, "LED Interpretation".

NOTE:
The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

WARNING:
Reseating and/or replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.

b. Error Type 14—Whenever the Announcement Checksum Test (#209) fails, this error is logged. The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by the **display announcement** command. This error only appears in the Error Log in conjunction with Error Type 2817. Follow the procedures for Error Type 2817 to troubleshoot Error Type 14.

c. Error Type 23—The circuit pack has been logically administered but not physically installed. The alarm is cleared when the circuit pack is installed.

d. Error Type 125—A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

e. Error Type 170—Announcement board is not allowed in slot A03 for a system with Enhanced SCC cabinet. The red led of announcement board is turned on and the error message "Announcement board is not allowed in slot A03" is shown on SAT when **test/busyout/release board A03** commands are entered. The announcement board must be removed and inserted into a different slot.

f. Error Type 217 and 267— Indicate that there is more than one TN750 Announcement circuit pack inserted in the system. Remove the alarmed circuit pack..

g. Error Type 257—This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

h. Error Type 513—This error, when reported with Aux Data in the range of 4352 to 4358, indicates the circuit pack has reported a hardware failure on the circuit pack. The circuit pack should be replaced.

WARNING:
Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.

i. Error Type 1025—This error is not service-affecting and no action is required.

j. Error Type 1281—The SP found a fault in the speech main memory (SMM) (that is, it found one or more faulty memory locations). Whenever this error is logged, error 2817 is also logged [see Note (k)], which causes the maintenance system to run the Announcement Checksum Test (#209) to determine if the bad memory location was being used by an announcement.

k. Error Type 1538—The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The tests run on the ports of this circuit pack are returning with a NO-BOARD.
   2. A busyout/release of the circuit pack has no effect on test results.
   3. A **list configuration** command shows that the circuit pack and ports are properly installed.

   The system tries to restore the circuit pack within 15 minutes. If the error recurs after 15 minutes, replace the circuit pack. (Refer to the "Handling Port Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures".)

l. Error Type 2049 and 2817—These errors are logged in conjunction with Error Type 1281, Aux Data 17699. Since that error [see Note (j)] means that a defective speech memory location was found, the announcement checksum error is also logged. This causes the Announcement Checksum Test (#209) to run, which determines if the defective memory location has corrupted any recorded announcements. If the Checksum Test passes, the faulty memory location is currently not being used, and the SP marks the location as faulty to ensure that future announcements do not attempt to use it.

NOTE:
As memory locations are marked faulty, the amount of available memory decreases, which decreases the total amount of announcement time available on the circuit pack.

m. Error Type 2049—A transient error that does not cause an alarm can occasionally occur during a SPE, TDM BUS, or Tone Clock interchange. It is possible for a marginal Tone-Clock circuit pack to cause this error against the ANN-BD without alarming the TONE-BD. If this error occurs again, replacing the Tone-Clock circuit pack may clear up this error. See the FAIL case in the Clock Match Inquiry Test (#212).

n. Error Type 3840— This error is not service-affecting and no action is required.

o. Error type 3999— Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

p. Error Type 2—Check the Class of Restriction (COR) administered for the Data Line extension assigned to the TN750 for uploading and downloading announcements. The extension can be found by using **list data-module**

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Control Channel Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Control Channel Loop Around Test (#52) (a)		X		ND
Angel-Speech Processor (SP) Handshake Test (#208)		X		ND
Clock Match Inquiry (#212)	X	X		ND
Super Frame Match Inquiry (#211)	X	X		ND
140AY Loop Around Test (#210)	X	X		ND
Announcement Checksum Test (#209)	X	X		ND
Network Processor Element (NPE) Audit Test (#50) (a)		X		ND
SAKI Test (#53) (a)			X	D

1 D = Destructive; ND = Nondestructive

a. For a complete description of these tests, refer to the "XXX-BD (Common Port Circuit Pack)" Maintenance documentation.

Angel-Speech Processor (SP) Handshake Test (#208)

This test checks the integrity of the communication link between the two processors on the Announcement circuit pack. Failure of this test indicates that the Speech Processor is insane and **results in the loss of all integrated announcements on the circuit pack.**

Table 11-24. TEST #208 Angel-Speech Processor (SP) Handshake Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-24. TEST #208 Angel-Speech Processor (SP) Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed. Circuit pack cannot be used. **Announcement speech memory is cleared when this test fails. Therefore, when the problem has been resolved, announcements must be rerecorded or downloaded to the circuit pack.** Refer to "General Notes" near the beginning of this Maintenance documentation. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack and then run this test again. 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack **even if Step 1 works**. **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance documentation.*
	PASS	The communications link between the two processors on the Announcement circuit pack is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to "ANN-PT (Announcement Port)" Maintenance documentation for a description of the port tests.

Announcement Checksum Test (#209)

Associated with every recorded announcement is a checksum. In this test, the SP checks a stored global checksum covering all recorded announcements against a calculated one and returns the results to the maintenance system. If the global checksum failed, maintenance requests the SP to check each individual announcement's checksum.

If the test fails, then it returns the total number of defective announcements found. In addition, associated with each failure is an error in the Error Log (Error Type 14). The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by the **display announcement** command.

Table 11-25. TEST #209 Announcement Checksum Test

Error Code	Test Result	Description/ Recommendation
0	ABORT	An error code of 0 indicates that the announcement file has been corrupted due to a hardware fault in the TN750 board. Follow step #7 under "General Notes" at the beginning of this section.
1023	ABORT	There are no announcements currently recorded on the circuit pack.

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Table 11-25. TEST #209 Announcement Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1024	ABORT	This abort code is given for the following reasons: 1. An announcement upload or download is in progress. 2. An announcement upload or download is requested when this test is running. 3. A record is in progress. 4. A record request comes in when this test is running. If an announcement upload or download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and [for G3iV1.1-286] the tape drive should be active or [for G3sV2, G3iV2-386, or G3vsV2] the "card-in-use" amber LED for the memory card is on (to determine the extension of the announcement data module, use the **list data-module** command). See Note (a) at end of table for more information. 1. Wait until the blocking event is finished, and then run this test again. An upload or download could take up to 45 minutes to complete, and a recording session is finished as soon as the station that was making the recording is placed on-hook. 2. If the test continues to abort, and a record or upload/download is not in progress, escalate the problem.

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Table 11-25. TEST #209 Announcement Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-25. TEST #209 Announcement Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0-256	FAIL	Test failed. The error code indicates the total number of defective announcements that were found. When TEST #209 fails with error code 0, the Global Checksum failed on the board, but no individual Checksum failed. **NOTE:** Since the announcements are recorded digitally, it is possible for the Announcement Checksum Test to *fail* but still have all the announcements sound uncorrupted. When an individual announcement fails the Checksum Test, always listen to the announcement first before taking any action (an announcement can be played back by dialing the announcement extension associated with the announcement number). If the announcement sounds corrupted, then rerecord it or delete it. 1. Look in the Error Log to determine the number of the first defective announcement. Play back the announcement. If the announcement sounds defective, rerecord it or delete it. If the error code was greater than one (indicating that there is more than one defective announcement), run this test again and repeat this step. 2. If after deleting and rerecording all defective announcements, the checksum test still fails, reset the circuit pack using the **reset board PCSS** command and run this test again. 3. If the test still continues to fail, reseat the circuit pack and restore all announcements with an appropriate time estimate (for example, 40 minutes.) Then rerecord the lost announcements (that is, those recorded since the last save operation) and run this test again. 4. If the test still continues to fail, replace the circuit pack, and run this test again. **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.*

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Table 11-25. TEST #209 Announcement Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	All recorded announcements checksum correctly, indicating that the speech main memory is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to "ANN-PT (Announcement Port)" Maintenance documentation for a description of the port tests.

Notes:

a. The Announcement circuit pack can exhibit a condition that does not allow recording.

   If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack will be unusable by software, one of which is the record port. Also, **save/restore announcements** will not work, since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this, and attempts to use the ports.

   If the circuit pack is locked into this state, the following symptoms are observed:

   1. When attempting to record an announcement, users hear the proper record tone, but the announcement do not record (they do not know it until the announcement is played back).
   2. Performing a **test board long** when the circuit pack is in this state yield the following abort codes:
      - Ports 1 AND 9 abort Test #206 with code 1024
      - Ports 1 AND 9 abort Test #205 with code 2000
      - Board level Tests #209 and #210 abort with code 1024
   3. The **save/restore announcements** command times out with:

      Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- reset circuit pack using the **reset board PCSS** command
- release circuit pack using the **release board PCSS** command

140AY Loop Around Test (#210)

This test checks the integrity of the record channel on the Announcement circuit pack (Announcement Port 1). The main function of the 140AY device is to accept Pulse Code Modulation (PCM)/Adaptive Differential Pulse Code Modulation (ADPCM) samples and compress/expand the samples using ADPCM. This test connects a Tone Generator to one port (Announcement Port 1, the recording port), and a Tone Detector to another port (Announcement Port 9). A tone is generated by the Tone Generator on the first port and looped through the 140AY device to the second port. The Tone Detector then responds with a tone present/absent message. The 140AY Loop Around Test is repeated at three different speech compression rates.

Since this test involves sending a tone through two different ports, the Playback Speech Memory Array (PSMA) Test (#206) [see ANN-PT (Announcement Port) Maintenance documentation for a description of this test] is run on the two ports first to make sure that they are working properly.

Table 11-26. TEST #210 140AY Loop Around Test

Error Code	Test Result	Description/ Recommendation
1-3	ABORT	Response to the test request was not received within the allowable time period. The error code indicates at which speech compression rate the test aborted (one being the first rate tested, three being the last). 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
10	ABORT	The PSMA Test (#206) failed on Announcement Port 1.
90	ABORT	The PSMA Test (#206) failed on Announcement Port 9. 1. Refer to"ANN-PT (Announcement Port)" Maintenance documentation, Test #206.

Continued on next page

Table 11-26. TEST #210 140AY Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. This test needs Announcement Ports 1 and 9 to run. One of the ports may be in use on a valid call. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and Ports 1 and 9 are not in use, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to the "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to the "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-26. TEST #210 140AY Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1007	ABORT	The Announcement circuit pack thinks that Port 1 or Port 9 is busy. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow the Announcement Port maintenance procedures for Ports 1 and 9. 3. If the Announcement Ports pass all their tests, escalate the problem.
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and [for G3iV1.1-286] the tape drive should be active or [for G3sV2, G3iV2-386, or G3vsV2] the "card-in-use" amber LED for the memory card should be on (to determine the extension of the announcement data module, use the **list data-module** command). See Note (a) at end of table for more information. 1. Wait until download is finished (can take up to 45 minutes), and then run the test again. 2. If the test continues to abort and there is no download in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this error type. 1. Retry the command at one minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-26. TEST #210 140AY Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2007	ABORT	The Announcement circuit pack thinks that Port 1 or Port 9 is busy. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow the Announcement Port maintenance procedures for Ports 1 and 9. 3. If the Announcement ports pass all their tests, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1-3	FAIL	Test failed. The error code indicates at which speech compression rate the test actually failed (one being the first rate tested, three being the last). 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test still fails, replace the circuit pack (see Warning) and run this test again. 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). ⚠ **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.*
	PASS	The record channel on the Announcement circuit pack is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to "ANN-PT (Announcement Port)" Maintenance documentation for a description of the port tests.

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Notes:

a. The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack will be unusable by software, one of which is the record port. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this, and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 AND 9 abort Test #206 with code 1024
   - Ports 1 AND 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- reset circuit pack using the **reset board PCSS** command
- release circuit pack using the **release board PCSS** command

Super Frame Match Inquiry Test (#211)

The super frame is a means by which the SP synchronizes with the 140AY device on the Announcement circuit pack. If the super frame is not synchronized, the SP is not able to properly process record/playback requests. Both the SP and the hardware generate a super frame pulse. When these two pulses are out of synch, the SP sets a flag to indicate the mismatch. When this test is run, the state of this flag is returned.

Table 11-27. TEST #211 Super Frame Match Inquiry

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-27. TEST #211 Super Frame Match Inquiry — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed. Announcement playbacks should sound corrupted. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.*
	PASS	The SP can properly process record/playback requests. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to "ANN-PT (Announcement Port)" Maintenance documentation for a description of the port tests.

Clock Match Inquiry Test (#212)

This test is supported to determine the state of the clock generation circuitry on the Announcement circuit pack. This circuitry is used for controlling various pieces of the hardware, like the 140AY device. It is also used to synchronize the Announcement circuit pack with the clock that is on the backplane.

Table 11-28. TEST #212 Clock Match Inquiry Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-28. TEST #212 Clock Match Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed. Announcements recorded or played back while the clock circuitry is not functioning properly sound distorted. The ANN-BD may be defective or the Active Tone-Clock circuit pack (TONE-BD) in the same Port Network as the ANN-BD may be marginal and is causing this test to fail. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, proceed to Step 2 or 3 as applicable. 2. If this is a High or Critical Reliability system, determine the Active TONE-BD in this Port Network via the **status system** command and make the Standby Tone-Clock circuit pack active via the **set tone-clock PCSS** command. Rerun the test. If the test passes, then replace the now Standby Tone-Clock circuit pack. If the test continues to fail, replace the ANN-BD circuit pack. **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.*

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Table 11-28. TEST #212 Clock Match Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	3. If this is a Standard system (that is, not a High or Critical Reliability system), replace the ANN-BD. Rerun the test. If the test continues to fail, replace the Tone-Clock circuit pack located in the same Port Network as the ANN-BD. **WARNING:** *Replacing the Tone-Clock circuit pack causes a standard system PPN to perform a COLD 2 reset or an EPN to reset. See the "How to Replace a Tone-Clock Circuit Pack" section in the "TONE-BD (Tone-Clock Circuit Pack)" Maintenance documentation. Replacing the ANN-BD results in loss of integrated announcements. See "General Notes" near the beginning of this Maintenance procedure.* 4. If there are recurring alarms on this circuit pack caused by this test failing, replace the ANN-BD even if the previous steps were successful. **WARNING:** *Replacing the TONE-BD causes a standard system PPN to perform a COLD 2 reset or an EPN to reset. Replacing the ANN-BD results in loss of integrated announcements. See the "General Notes" section near the beginning of this Maintenance procedure.*
	PASS	Announcement record/playbacks should have clear sound quality. User-reported troubles on this circuit pack should be investigated using other circuit packs and port tests. Refer to "ANN-PT (Announcement Port)" Maintenance documentation for a description of the port tests.

ANN-PT (Announcement Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ANN-PT	MINOR	test port PCSSpp l	Announcement Port
ANN-PT	WRN	test port PCSSpp l	Announcement Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The TN750 Announcement circuit pack is a service circuit pack that provides a customer with an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (that is, announcements on hunt group calls). There are 16 Announcement Ports on the Announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. In addition to the 16 Announcement Ports, the Announcement circuit pack also has one Data Line Circuit Port (Port 17). The Data Line Circuit Port is used for uploading/downloading the announcement memory to/from the system tape. If there are any errors associated with Port 17, refer to "DAT-LINE (Data Line)" Maintenance documentation. If there are any errors associated with the circuit pack, refer to "ANN-BD (Announcement Circuit Pack)" Maintenance documentation.

The Announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack, and communicates with the switch via the control channel on the TDM Bus. The second processor, or SP, controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels (one for each Announcement Port).

General Notes

Here are a few **very important** general notes that apply to any problem on the Announcement circuit pack. The user should read this before attempting to work on the TN750 Announcement circuit pack or Announcement Ports, **especially if the circuit pack needs to be replaced.**

1. The Announcement circuit pack retains all integrated announcements *as long as the circuit pack has power.* For this reason, whenever there is a problem with either the Announcement circuit pack or an Announcement Port that may require the circuit pack to be reset, it is always better to try to reset the circuit pack via the **reset board PCSS** command first and, if that

does not work, then try to reseat it. **Announcements are preserved through a software reset, but they are lost when the circuit pack is reseated.**

2. **If a customer has announcements on the Announcement circuit pack that cannot be re-recorded easily, then announcements must be saved on the system tape to ensure that they are not lost.** This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the pack is in proper working order (see Note).

   This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the pack is in proper working order (see Note).

   NOTE:
   Unlike translations, announcements are NEVER automatically saved to the system tape.

3. The administration terminal **save announcements** command replaces the announcement file on tape with the Announcement circuit pack speech memory. Care must be taken not to mistakenly enter this command, thereby destroying a valid file on tape.
4. The terminal **restore announcements** command replaces the Announcement circuit pack speech memory with the announcement file on the system tape. Care must be taken not to mistakenly enter this command, thereby destroying valid speech memory (especially if the system tape does not have a valid announcement file on it).
5. Whenever the Announcement circuit pack is replaced, announcements must always be re-recorded or downloaded to the new circuit pack. Otherwise, call processing is not able to use the circuit pack.
6. If announcement speech memory is corrupted, **announcements should not be saved**, that is, if the Announcement Checksum Test (#209) fails or if the speech sounds corrupted on playback. This can ruin a good announcement file on tape and potentially cause errors/alarms on any circuit pack to which the new file is downloaded. However, if the customer does not have a valid announcement file on tape, then announcements can be saved in an effort to try to retain some of them (all of the announcements recorded may not be corrupted).
7. Although Announcement Port 5 and Data Line Circuit Port 17 on the Announcement circuit pack are logically two separate ports, they are physically the same port. Therefore, if one of the ports is in use, the other one will be busy. Also, if Announcement Port 5 is out-of-service, the Data Line Circuit Port is taken out-of-service. However, if the Data Line Circuit Port is out-of-service, the Announcement Port remains in-service.

Announcement Administration

A brief description of the integrated announcement administration is given here to aid in the troubleshooting of the Announcement circuit pack and its ports. In many cases, it is necessary to record, play back, and/or delete announcements to resolve an alarm. It may also be necessary to save and restore announcements as part of the maintenance procedures. For a complete description of integrated announcement administration, please refer to the following manuals:

1. *DEFINITY Communications System Generic 3 Implementation*, 555-230-653
2. *DEFINITY Communications System Generic 1 and Generic 3 Voice Terminal Operations,* 555-230-701
3. *DEFINITY Communications System Generic 1 and Generic 3 System Management,* 555-230-500
4. *DEFINITY Communications System Generic 3 V2 Traffic Reports*, 555-230-511

Announcement Session

Announcements can be recorded, played back, and deleted from an announcement session. A station's COS needs to include console permissions in order for that station to be able to enter an announcement session. To enter an announcement session, go off-hook on a station that has console permissions and enter the appropriate FAC (administered as Announcement access code on the FACs form). Dial tone should be returned at this point. Enter the extension of the announcement that needs to be recorded, deleted or played back. Again, dial tone should be heard. To record an announcement, press station keypad digit 1, record after the tone, and hang up when done. To play back an announcement, press station keypad digit 2. To delete an announcement, press station keypad digit 3 (confirmation tone is given if the delete worked). Announcements can also be played back by simply calling the announcement extension associated with them.

Uploading/Downloading Announcements

Integrated announcements on the TN750 Announcement circuit pack can be uploaded to the system tape with the administration terminal **save announcements** commands. Similarly, integrated announcements can be downloaded to the Announcement circuit pack with the administration terminal **restore announcements** command. Both of these commands require a free data module of NETCON type to be administered, a data module of announcement type (on the Announcement circuit pack) to be administered, and a tape cartridge to be in the system's tape drive (must not be write-protected).

These commands are useful in maintaining the customer's recorded announcements. Depending on system traffic, announcement uploads/downloads take between 30 and 45 minutes.

The system **automatically** tries to download the Announcement circuit pack five minutes after it is inserted. This automatic download procedure is aborted if:

1. An announcement is recorded within 10 minutes of circuit pack insertion.
2. An announcement download is invoked sooner with the administration terminal **restore announcements** command.
3. There is no announcement and/or NETCON data module administered.
4. Either the announcement data module is busy or all the administered NETCON data modules are busy.
5. There is no tape in the system.
6. The tape in the system does not have a valid announcement file saved on it.

NOTE:
Unlike translations, there is no provision in the system for automatically saving announcements to the system tape.

Hardware Error Log Entries and Test to Clear Values

Announcement Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1		Playback Speech Memory Array (PSMA) Test (#206)	MINOR	ON	test port PCSSpp sh r 3
18	0	The port was busied out	WARNING	OFF	release port PCSSpp
130 (a)		None	WARNING	ON	test port PCSSpp sh
257		Channel Administration Memory Array (CAMA) Test (#205)	MINOR	ON	test port PCSSpp l r 3
	17667	In-line error			
5		140AY Channel Sanity Inquiry Test (#222)	MINOR	ON	test port PCSSpp sh r 3
	17684	In-line error			
769 (b)		None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

b. This error is logged and the port is alarmed when an alarm is raised on the Announcement circuit pack because of a faulty condition with a common circuit pack resource. Any one of the following alarmed errors on the Announcement circuit pack causes this error to be logged against the Announcement Port: 1793, 2049, 2305, 2561. Follow the ANN-BD (Announcement Circuit Pack) Maintenance documentation to resolve these alarms. When the corresponding circuit pack alarm is cleared, this alarm clears.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Channel Administration Memory Array (CAMA) Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Channel Administration Memory Array (CAMA) Test (#205)		X	ND
Playback Speech Memory Array (PSMA) Test (#206)	X	X	ND
140AY Channel Sanity Inquiry Test (#222)	X	X	ND

1 D = Destructive; ND = Nondestructive

Channel Administration Memory Array (CAMA) Test (#205)

This test is a memory device that stores information used to control the 140AY device. The Angel asynchronously feeds the CAMA with the control information. During the CAMA test, the Angel writes patterns into the CAMA, reads them back, and verifies that they match. If the patterns do not match, the test fails. This test is run periodically by the switch maintenance and by the Announcement circuit pack in the background.

Table 11-29. TEST #205 Channel Administration Memory Array (CAMA) Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the circuit pack is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. See Note (a) at end of table for more information.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-29. TEST #205 Channel Administration Memory Array (CAMA) Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed. Announcements played back on this port may sound corrupted. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. Refer to "General Notes" near the beginning of this Maintenance procedure.*
	PASS	This test verifies that the Angel processor can properly set up this port for playbacks. User-reported troubles on this circuit pack should be investigated using other port and circuit pack tests. (Refer to "ANN-BD (Announcement Circuit Pack)" Maintenance documentation for a description of the circuit pack tests.)

Notes:

a. The Announcement circuit pack can exhibit a condition that does not allow recording.

   If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and attempts to use the ports.

   If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 AND 9 abort Test #206 with code 1024
   - Ports 1 AND 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- reset circuit pack using the **reset board PCSS** command
- release circuit pack using the **release board PCSS** command

Playback Speech Memory Array (PSMA) Test (#206)

The PSMA test checks the integrity of a playback channel's interface to the speech memory and the TDM Bus. The SP has an internal buffer that contains a specific 256-byte sequence. During this test, the byte sequence is "played" through the 140AY device onto the TDM Bus. A General Purpose Tone Detector is used to confirm that the proper sequence was played. **This test is very important.** It is the only test that actually checks an Announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence. The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

It is the only test that actually checks an Announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence. The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

Table 11-30. TEST #206 Playback Speech Memory Array (PSMA) Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the pack is not in use, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to "TDM-BUS (TDM Bus)" Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-30. TEST #206 Playback Speech Memory Array (PSMA) Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to "TTR-LEV (TTR Level)" Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to "TONE-PT (Tone Generator)" Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and the tape drive should be active. (To determine the extension of the announcement data module, use the **list data-module** command.) See Note (a) at end of table for more information. 1. Wait until download is finished (could take a maximum of 45 minutes), and then run the test again. 2. If the test continues to abort and there is no download in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.

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Table 11-30. TEST #206 Playback Speech Memory Array (PSMA) Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1 to 254	FAIL	Test failed. The error code indicates the number of byte count errors found by the Tone Detector. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. Refer to "General Notes" near the beginning of this Maintenance procedure.*

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Table 11-30. TEST #206 Playback Speech Memory Array (PSMA) Test — *Continued*

Error Code	Test Result	Description/ Recommendation
255	FAIL	Test failed. The Announcement Port and the Tone Detector never synchronized. Check for active GPTD-PT errors, and refer to "GPTD-PT [General Purpose Tone Detector Port (CPTR)]" Maintenance documentation to diagnose them first. 1. If there are no active GPTD-PT errors, reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. Refer to "General Notes" near the beginning of this Maintenance procedure.*
	PASS	This port can cleanly play announcements. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to "ANN-BD (Announcement Circuit Pack)" Maintenance documentation for a description of the circuit pack tests.

Notes:

a. The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work, since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 and 9 abort Test #206 with code 1024
   - Ports 1 and 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- reset circuit pack using the **reset board PCSS** command
- release circuit pack using the **release board PCSS** command

140AY Channel Sanity Inquiry Test (#222)

The Angel keeps a sanity status bit for each of the 16 channels on the 140AY device. This test queries the Angel to determine the status for a particular channel. If a channel is insane, that implies that announcements cannot be played back on that channel.

Table 11-31. TEST #222 140AY Channel Sanity Inquiry Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Test failed. Announcements cannot be played back over this port. 1. Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** *Replacing the circuit pack results in loss of integrated announcements. Refer to "General Notes" near the beginning of this Maintenance procedure.*
	PASS	Announcements can be played back over this port. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to the "ANN-BD (Announcement Circuit Pack)" Maintenance documentation for a description of the circuit pack tests.

ANNOUNCE (Announce)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
ANNOUNCE	none	none	ANNOUNCEMENT

The ANNOUNCE MO logs an error in the hardware error log if at least one of the following is true:

- The **save announcements** or **restore announcements** command does not complete successfully, or the
- System fails to restore announcements from the memory card [386 system] or tape [286 system] at boot time.

Figure 11-7 shows the connection of the Announcement Circuit Pack to the system. To save or restore announcements, an ANNOUNCEMENT Data Extension must be administered, and at least one DATA-CHL (Network Control Data Channel) must be in the in-service/idle state.

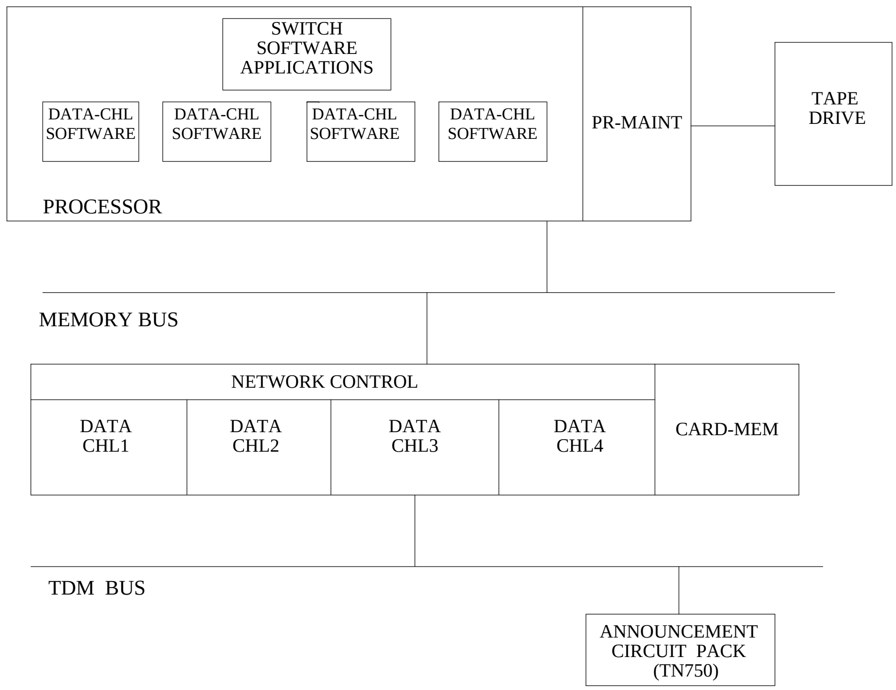

Figure 11-7. Connection of Announcement Circuit Pack to the System

Hardware Error Log Entries

ANNOUNCE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)(f)	any	None			
257(b)(f)	any	None			
513(c)(f)	0	None			
769(d)(f)	0	None			
1025(e)(f)	any	None			

Notes:

a. Error occurred while saving announcements. (See Table 11-32 in the next section for an explanation of Aux Data and for recommended repair actions.)

b. Error occurred while saving announcements to the standby SPE. (See Table 11-32 in the next section for an explanation of Aux Data and for recommended repair actions.)

c. User pressed cancel while announcements were being saved by the active PE.

d. User pressed cancel while announcements were being saved by the standby PE.

e. Error occurred while restoring announcements. (See Table 11-32 in the next section for an explanation of Aux Data and for recommended repair actions.)

f. The port field for this error contained the active PE complex when the error occurred.

Aux Data Error Codes and Recommended Repair Procedures

Table 11-32. Aux Data Error Codes and Recommended Repair Procedures

Aux Data	Description/ Recommendation
9000 through 9031	CARD-MEM [386 systems] errors. Check and resolve CARD-MEM [386 systems] errors and alarms.
30001 through 30054	Tape [286 systems] errors. Check and resolve TAPE [286 systems] errors and alarms.
32001	Internal system error. 1. Check other ANNOUNCE errors and take corrective action. If there are no other ANNOUNCE errors, do the following: 2. Retry the command at two minute intervals a maximum of three times. 3. If the **save/restore announcements** command fails, escalate the problem.
32002	Announcement circuit pack is in use. 1. Retry the command at two minute intervals a maximum of three times. 2. If the **save/restore announcements** command fails, escalate the problem.
32003	Announcement port is in use. 1. Wait for all Announcement ports to become available. 2. Enter the **save/restore announcements** command.
32004	There are no announcements recorded on the Announcement Circuit Pack. The **save announcements** command is not allowed to prevent the destroying of the announcement file on tape [286 systems] or on the memory card [386 systems].

Continued on next page

Table 11-32. Aux Data Error Codes and Recommended Repair Procedures — *Continued*

Aux Data	Description/ Recommendation
32005	Integrated announcement circuit pack is not present. The Announcement Circuit Pack is not inserted, or it is defective. 1. Enter the **list config** command to check for the presence of the circuit pack in the system. 2. If the Announcement Circuit Pack is present, use the **test board PCSS** command to check the status of the Announcement Circuit Pack.
32006	Announcement Data Module not available. 1. Use the **status** command to check the status of the Announcement Data Module.
32007	Announcement Data Module out of service. 1. Use the **status** command to check the status of the Announcement Data Module.
32008	Announcement data is being saved or loaded. 1. Retry the command at two minute intervals a maximum of three times. 2. If the **save/restore announcements** command fails, escalate the problem.
32009	Required DATA-CHL is not administered or out of service. (A DATA-CHL is required to save or restore announcements.) 1. Add a DATA-CHL if none is administered. 2. If a DATA-CHL is administered, use the **status** command to check the status of all DATA-CHLs. At least one DATA-CHL should be in the in-service/idle state.
32010 32013	DATA-CHL is not administered, or it is unavailable. (A DATA-CHL is required to save or restore announcements.) 1. Add a DATA-CHL if none is administered. 2. If a DATA-CHL is administered, use the **status** command to check the status of all DATA-CHLs. At least one DATA-CHL should be in the in-service/idle state.
32012	Required Announcement Data Module is not administered. 1. Add an Announcement Data Module and repeat the command.

Continued on next page

Table 11-32. Aux Data Error Codes and Recommended Repair Procedures — *Continued*

Aux Data	Description/ Recommendation
32014	Command timed out on the standby processor [286 systems]. This could present problems. 1. Check the error and alarm logs for errors and alarms that are logged against the STBY-SPE (Standby SPE) [286 systems].
32015	Time of day not set. 1. Set the time of day, and reenter the **save/restore announcements** command.
32016	Internal System errors. Check for any other ANNOUNCE errors and take corrective action.If there are no other announcements errors, do the following: 1. Retry the command at two minute intervals a maximum of three times. 2. If the **save/restore announcements** command fails, escalate the problem.

ASAI-ADJ (Adjunct-Switch Application Interface) [G3iV1.1-286,G3iV2-386]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ASAI-ADJ	MAJ/MIN/WRN[1]	test station extension l	ASAI Adjunct

1 The alarm level for ASAI adjunct ports may be administered using the **set options** command. The alarm level can be set independently for Off-Board and On-Board alarms to WARNING, MINOR, or MAJOR for all ASAI adjunct ports in the system.

Refer to "BRI-SET, ASAI-ADJ, BRI-DAT" Maintenance documentation.

BRI-BD/LGATE-BD (ISDN-BRI Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
BRI-BD	MAJOR	test board PCSS l	ISDN-BRI Line Circuit Pack
BRI-BD	MINOR	test board PCSS l	ISDN-BRI Line Circuit Pack
BRI-BD	WARNING	test board PCSS sh	ISDN-BRI Line Circuit Pack
LGATE-BD	MAJOR	test board PCSS l	DEFINITY Lan Gateway
LGATE-BD	MINOR	test board PCSS l	DEFINITY Lan Gateway
LGATE-BD	WARNING	test board PCSS sh	DEFINITY Lan Gateway

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.).

NOTE:
Some of the information in this section is reserved for future use.

CAUTION:
A detailed flowchart for isolating and resolving Packet Bus faults is included in Chapter 9, "Packet Bus Fault Isolation and Correction". This flowchart, along with the other information presented in the chapter, can help in resolving problems that involve more than a single station or circuit pack. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to reference Chapter 9, "Packet Bus Fault Isolation and Correction", in addition to the relevant MO documentation.

ISDN-BRI Line is a packet port circuit pack that provides access to ISDN-BRI endpoints. The ISDN-BRI Line circuit pack supports 12 ports, each of which provides access to ISDN stations. Voice and circuit-switched data from the ISDN stations are carried on the Time Division Multiplex (TDM) Bus. Signaling is carried over the Packet Bus.

LEDS

The ISDN-BRI Line circuit pack performs extensive initialization tests and lights both the red and green LEDS during the initialization testing. See Chapter 7, "LED Interpretation", for more details on circuit pack status LEDs.

Hardware Error Log Entries and Test to Clear Values

BRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS sh r 1
1(a)	Any	None	MINOR	ON	
18(b)	0	busyout board PCSS	WARNING	OFF	release board PCSS
23(c)	0	None	WARNING	OFF	
257(d)	65535	Control Channel Loop Test (#52)	MINOR	ON	test board PCSS r 20
513(e)	4352 to 4357				
769(f)	4358				
1025(g)	4363	NPE Audit Test (#50)			
1293 to 1294 (h)	46088 to 46096	SAKI Sanity Test (#534)	MINOR	ON	See footnote (h)
1537 to 1538 (i)	46082		MINOR	ON	
1793 (j)	46080		MINOR	ON	
1794 (j)	46094		MINOR	ON	
1795 (j)	46085		MINOR	ON	
2306 (j)		LANBIC Receive Parity Error Counter Test (#595)			
3330 (k)	46083		MINOR	OFF	
3840 (l)	4096 to 4101				
3843 (m)	46097				
3999 (n)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

> **NOTE:**
> The alarm is logged approximately 11 minutes after the circuit pack has been removed and/or SAKI Sanity Test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, then follow the instructions for "Red (alarm)" in the "Control and Port Circuit Pack Status LEDs" section in Chapter 7, "LED Interpretation". (Also, refer to the "Handling Port Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures".

b. This circuit pack has been busied out via the **busyout board PCSS** command.

c. Port(s) has(have) been administered on this circuit pack but the circuit pack is not physically present.

d. This error indicates transient communication problems between the switch and this circuit pack. Execute the **test board PCSS** command and refer to the repair procedures for the Control Channel Loop Around Test (#52).

e. An on-board hardware failure has been detected by the circuit pack.

The reported aux data values correspond to the following detected errors:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4357	Instruction set error

Reset the circuit pack by executing the **busyout board PCSS** and **reset board PCSS** commands. When it is reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedure in footnote (a) for error type 1.

f. This error is reported by the circuit pack when it detects a program logic error. While no action is required, this error may lead to errors of other types being reported against this circuit pack.

g. This error is reported by the circuit pack when it cannot update NPE memory and read it back. This error type can be ignored, but may lead to errors of other types being reported against this circuit pack.

h. A critical hardware failure has been detected on the circuit pack. Reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. If the Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm via the **test board PCSS long clear** command. If the Circuit Pack Restart Test (#594) fails, replace the circuit pack.

   The reported error types correspond to the following detected errors:

1293	On-board auxiliary processor insane
1294	Internal memory access error

i. These error types are reported when the following errors are detected:

1537	Frame overrun at Packet Bus interface. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those maintenance objects.
1538	Circuit packet is hyperactive; that is, it is flooding the switch with messages sent over the control channel. The circuit pack is taken out-of-service when a threshold number of these errors is reported to the switch. Clear the alarm via the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS long clear**, **release board PCSS**. If the error recurs within 10 minutes, then replace the circuit pack.

j. These errors indicate that the circuit pack is having problems transmitting data to the Packet Bus.

1793	Parity errors are detected when transmitting data to the Packet Bus.

1794	Overflow of Packet Bus transmit buffers has occurred.
1795	Circuit pack cannot find end of frame when transmitting to Packet Bus. Clear the alarm via the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS long clear**, **release board PCSS**. If the error recurs within 10 minutes, then replace the circuit pack.
2306	This error occurs when the circuit pack detects an error in a received frame from the packet bus. These errors are most likely caused by a packet bus problem, but may be due to a circuit pack fault.An invalid Link Access Procedure Data (LAPD) frame error occurs if the frame contains a bad Cyclical Redundancy Checking (CRC), is greater than the maximum length, or violates the link level protocol.When bus parity errors are reported, the LANBIC Receive Parity Error Counter Test (#595) should be performed to determine if the condition had cleared. Refer to the "PKT-BUS (Packet Bus)" Maintenance documentation to determine if the problem is isolated to this circuit pack or if the problem is caused by Packet Bus faults.

k. A critical failure has been detected in the Packet Bus interface of the circuit pack. This failure may be due to either a Packet Bus fault or an on-board fault. If the Packet Bus is alarmed, refer to the "PKT-BUS (Packet Bus)" section and Chapter 9, "Packet Bus Fault Isolation and Correction" for recommended repair procedures. The probability of this error being related to Packet bus problems increases with the number of ISDN-BRI circuit packs displaying this error.

   If the Packet Bus is not alarmed, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. If the Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm via the **test board PCSS long clear** command. If the Circuit Pack Restart Test (#594) fails, replace the circuit pack. If the problem persists after complying with the above instructions, then follow normal escalation procedures.

l. These errors are not service-affecting. No action is required. These errors are reported by the circuit pack when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

4096	Bad major heading
4097	Bad port number
4098	Bad data

4099	Bad sub-qualifier
4100	State inconsistency
4101	Inconsistent downlink message

m. This error is not service-affecting. No action is required.

3843	Bad translation RAM detected, but call continues by using another translation location.

n. Error type 3999— Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Control Channel Loop Around Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Audit Test (#50)

Refer to the repair procedure described in the"XXX-BD (Common Port Circuit Pack)" Maintenance documentation as NPE Audit Test (#50).

Control Channel Loop Around Test (#52)

Refer to the repair procedure described in the "XXX-BD (Common Port Circuit Pack)" Maintenance documentation as Control Channel Loop Around Test (#52).

SAKI Sanity Test (#53)

Refer to the repair procedure described in the "XXX-BD (Common Port Circuit Pack)" Maintenance documentation as SAKI Sanity Test (#53).

LANBIC Receive Parity Error Counter Test (#595)

This test is destructive.

The test reads and clears the LANBIC Receive Parity Error Counter on the circuit pack. This counter is incremented by the circuit pack when it detects a parity error in data received from the Packet Bus.

These errors may be indicative of a circuit pack problem, Packet Bus problem, or a problem with another circuit pack on the bus. This test is useful for verifying the repair of the problem.

Table 11-33. TEST #595 LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2012	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-33. TEST #595 LANBIC Receive Parity Error Counter Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1-10	FAIL	The circuit pack is still detecting errors of this type. The error code indicates the value of the on-board error counter. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, verify the validity of the Packet Bus. Run the Packet Bus maintenance test with the **test pkt P long** command. If any Packet Bus tests fail, refer to the"PKT-BUS (Packet Bus)" Maintenance documentation for recommended repair procedures. 3. If the Packet Bus test passes, check the validity of the circuit pack. Execute a test that involves data transmission onto the Packet Bus. For example, the BRI may use the connectivity tests of the port-level maintenance object (BRI-PORT) by executing the **test port PCSSpp** command. Refer to the repair procedures for the executed test if it fails. Otherwise, proceed to the next step. 4. Other circuit packs on the Packet Bus may be the cause of the parity error. Use the **display errors** command to check the Error Log for other circuit packs that are alarmed. If any alarms are present for the other circuit packs, retire those alarms also. Then, rerun the LANBIC Receive Parity Error Counter Test (#595) on this circuit pack.
	PASS	No errors detected by circuit pack.

BRI-DAT (ISDN-BRI)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
BRI-DAT	WARNING[1]	test data-module	ISDN-BRI Standalone Data Module

1 The alarm level for ASAI adjuncts may be administered using the **set options** command. The alarm level can be set independently for Off-Board and On-Board alarms to WARNING, MINOR, or MAJOR for all ASAI adjuncts in the system.

Refer to BRI-SET (ISDN-BRI Set) Maintenance documentation.

BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
BRI-PORT	MINOR	test port PCSSpp l	ISDN-BRI Port
BRI-PORT	WARNING	test port PCSSpp sh	ISDN-BRI Port
ABRI-PORT	MAJOR[2,3]	test port PCSSpp l	ASAI ISDN-BRI Port
ABRI-PORT	WARNING[2,3]	test port PCSSpp l	ASAI ISDN-BRI Port
ATT-PORT	MAJOR[2, 3]	test port PCSSpp l	AT&T Adjunct ISDN-BRI Port
ATT-PORT	WARNING[2, 3]	test port PCSSpp l	AT&T Adjunct ISDN-BRI Port
LGATE-PORT	MAJOR[2, 3]	test port PCSSpp l	Ethernet ASAI Port
LGATE-PORT	WARNING[2, 3]	test port PCSSpp l	Ethernet ASAI Port
ATTE-PT	MAJOR[2, 3]	test port PCSSpp l	Ethernet AT&T Adjunct Port
ATTE-PT	WARNING[2, 3]	test port PCSSpp l	Ethernet AT&T Adjunct Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

2 The alarm level for ASAI and AT&T adjunct ports may be administered using the **set options** command. The alarm level can be set independently for Off-Board and On-Board alarms to WARNING, MINOR, or MAJOR for all ASAI and AT&T adjunct ports in the system.

3 All alarming for an ASAI and AT&T adjunct and OFF-BOARD alarming for an ASAI or AT&T port is disabled if the ASAI or AT&T adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm is logged against the ASAI or AT&T adjunct. The Hardware Error and Alarm Logs should be checked to see if the adjunct has disabled alarming.

NOTE:
Some of the information in this section is reserved for future use.

CAUTION:
A detailed flowchart for isolating and resolving Packet Bus faults is included in Chapter 9, "Packet Bus Fault Isolation and Correction". This flowchart, along with the other information presented in the chapter, can help in resolving problems that involve more than a single station or circuit pack. Whenever the repair procedures for this Maintenance Object refer to Packet

Bus and/or Packet Control maintenance, be sure to reference Chapter 9, "Packet Bus Fault Isolation and Correction" in addition to the relevant MO documentation.

WARNING:

If a significant Packet Bus failure occurs, errors and alarms may not be logged as expected for BRI-PORT/ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT. Conditions under which this occurs are detailed in the "Maintenance of the Packet Bus" section of Chapter 9, "Packet Bus Fault Isolation and Correction".

The TN2208 LGATE MFB provides DEFINITY with the interface to Adjunct-Switch Application Interface (ASAI) and AT&T adjuncts (for example, CONVERSANT®. Voice System). The circuit pack contains 12 ports of line circuit interface (although only 8 are usable by the switch), each of which operates with two B-channels (referred to as B1 and B2 throughout this section) and one D-channel as specified in the AT&T ISDN-BRI Specification. In this context, the term "ISDN-BRI port" is used to refer collectively to ports on the TN2208 circuit pack which are connected to ASAI or AT&T adjuncts.

The TN556 and TN2198 ISDN-BRI Line circuit packs provide DEFINITY with the interface to ISDN-BRI end points, Adjunct-Switch Application Interface (ASAI) and AT&T adjuncts (for example, CONVERSANT®. Voice System). The circuit packs contain 12 ports of line circuit interface, each of which operates with two B-channels (referred to as B1 and B2 throughout this section) and one D-channel as specified in the AT&T ISDN-BRI Specification. In this context, the term "ISDN-BRI port" is used to refer collectively to ports on the TN556 an TN2198 circuit packs which are connected to either BRI endpoints or ASAI or AT&T adjuncts.

For BRI endpoints, each B-channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B-channels are not used on ports connected to ASAI or AT&T adjuncts. The D-channel is used for conveying signaling between the switch and a BRI endpoint(s) or ASAI or AT&T adjunct. Each ISDN-BRI D-channel is connected to the switch processor and the ISDN-BRI port through the Packet Control circuit pack and the Packet Bus.

ISDN-BRI endpoints are available in various configurations. All endpoints require the D-channel to convey signaling information to the switch. Only one B-channel is required for a voice-only set or a stand-alone data module (BRI-DAT). A voice and data-capable set requires both B-channels (one for voice and one for data). Therefore, each TN556 or TN2198 port can support either two voice-only sets, two stand-alone data modules (BRI-DAT), or one voice and data-capable set. Only a single ASAI or AT&T adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 11-8 illustrates the physical connection (solid line) between an ISDN-BRI Port and its associated ISDN-BRI set(s). Each physical connection allows for two

B-channels and one D-channel. Each ISDN-BRI circuit pack can support up to 12 of these *physical* connections to different voice and voice/data sets or ASAI or AT&T adjuncts. On a TN2198 each ISDN-BRI circuit pack can support up to 12 *physical* connections to a NT1, which, in turn, connects to 2 terminals.

This section covers the maintenance documentation for ISDN-BRI ports. Some of the results of maintenance testing of ISDN-BRI ports may be affected by the health of the ISDN-BRI Line circuit pack (BRI-BD), BRI endpoint (BRI-SET), or ASAI adjunct (ASAI-AJ/LGATE-AJ) or AT&T adjunct (ATT_AJ/ATTE-AJ). These interactions should be kept in mind when investigating the cause of ISDN-BRI port problems. For more information on the circuit pack and endpoints, refer to the BRI-BD (ISDN-BRI Line Circuit Pack) Maintenance documentation, the BRI-SET (ISDN-BRI Endpoint) Maintenance documentation, and ASAI-AJ (Adjunct-Switch Application Interface) Maintenance documentation, ATT-AJ (AT&T Adjunct) Maintenance documentation, LGATE-AJ (Ethernet Adjunct-Switch Application Interface) Maintenance documentation, and ATTE-AJ (Ethernet AT&T Adjunct) Maintenance documentation.

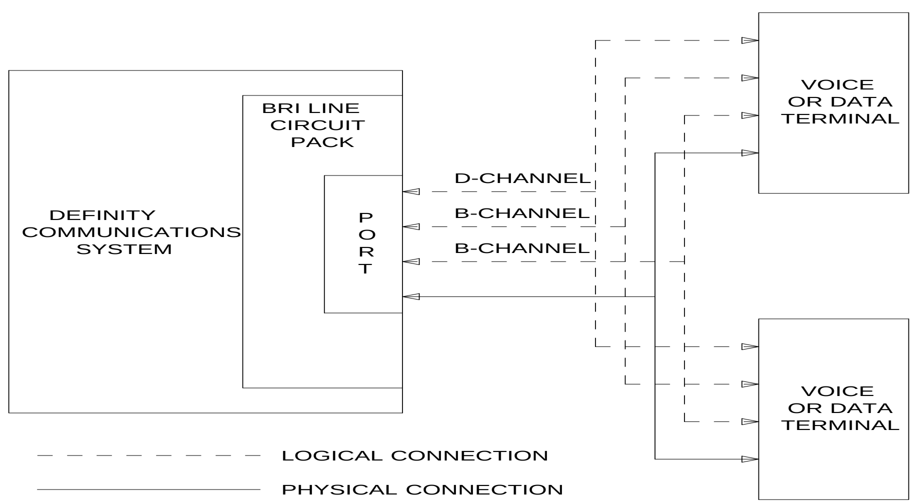

Figure 11-8. ISDN-BRI Port Interactions

Hardware Error Log Entries and Test to Clear Values

Table 11-34. ISDN-BRI Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level BRI-PORT	Alarm Level ABRI-PORT ATT-PORT LGATE-PORT ATTE-PT	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	(a)	Level 1 Status Inquiry (#621)	WRN	MAJ/MIN/ WRN[2]	OFF	test port PCSSpp sh r 2
18		busyout port PCSSpp	WRN		OFF	release port PCSSpp
130 (b)			WRN		ON	test port PCSS sh
257 (c)	(c)	EPF Inquiry (#622)	WRN	MAJ/MIN/ WRN[2]	OFF	test port PCSSpp sh r 1
513 (d)	(d)	none	(d)	(d)	ON	
769 (e)	0	none	WRN	MAJ	OFF	
1281 (f)		NPE Crosstalk (#617)	MIN/ WRN[2]		ON	test port PCSSpp l r 2
1537 (g)	46210	CRC Error Counter (#623)	WRN	MAJ/MIN/ WRN[2]	OFF	
1793 (h)		BRI Port Local TDM	MIN/ WRN[2]		ON	test port PCSSpp l r 2
		Loop Around (#619)				
3841 (i)	46208	None				
3842 (j)	0	None				
3843 (k)	0	None				
3844 (l)	46223	None				
3845 (m)		None				
3846 (n)	TEI	None				
3847 (o)	0	None				

Continued on next page

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description, and follow the recommended procedures.

2 Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. This error occurs when the Level 1 Status Inquiry fails or when the BRI circuit pack detects that Level 1 has been deactivated on the port. The aux data field contains one of the following values:

- blank - this indicates that the Level 1 Status Inquiry failed.
- 32773 - this is a message from the BRI-LINE circuit pack indicating Level 1 has been deactivated.

Refer to the repair procedures for Test #621.

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

c. This error occurs when the EPF Status Inquiry fails due to an overcurrent condition or when the BRI-LINE circuit pack detects that the EPF is in an over current condition. The aux data field contains one of the following values:

- blank - this indicates that the EPF Status Inquiry failed due to an overcurrent condition.
- 40988 - this indicates that the BRI-LINE circuit pack has detected an overcurrent condition and has turned the EPF off.

Execute the Short Test Sequence and see the repair procedures for Test #622.

d. This error indicates that the circuit pack is having problems transmitting data to the Packet Bus, thus affecting the conveyance of signaling information over the D-channel. With Aux Data 46222, this error occurs when the Packet Bus transmit buffers overflow. This condition probably indicates a hardware problem. The BRI-PORT Alarm Level for the error with Aux Data 46222 is "MIN/WRN," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJ/MIN/WNR." With Aux Data 0, this error occurs whenever the Packet Bus transmit FIFO buffers overflow. This condition can be caused by an on-board hardware problem as well as by problems on the Packet Bus that disrupt the BRI circuit pack's ability to transmit data onto the Packet Bus. Use troubleshooting procedures for both on-board hardware problems and potential off-board Packet Bus problems. See the "PKT-BUS (Packet Bus)" Maintenance section in this chapter as well as Chapter 9, "Packet Bus Fault Isolation and Correction" for more details on Packet Bus troubleshooting procedures. The BRI-PORT Alarm Level for the error with Aux Data 0 is "MINOR," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJOR."

e. This error occurs when the NPE Crosstalk Test (#617) fails. Run the Long Test Sequence, and pay particular attention to the results of Test #617.

f. This error occurs when broadcast signaling links associated with this port have too much link establishment related traffic. This could occur if an endpoint on this port is sending link establishment traffic on a port level broadcast link, or if there are Level 1 problems on the port. Check the error logs for Level 1 errors. If Level 1 problems exist, follow the repair procedures listed for test #621. Software will suspend activity to this port for 75 minutes when the port is alarmed due to this error (note that service suspension does not occur if the port is an ABRI-PORT/LGATE-PT/ATTE-PT/ATT-PORT). If this problem persists, replace the endpoint or endpoints associated with this port. If replacing the endpoints does not fix the problem, follow normal escalation procedures.

g. This error occurs when the port receives an invalid frame over the D-channel. When CRC errors exceed five within 15 minutes, the port is taken out of service for five seconds. If five more CRC errors are received within 15 minutes of the first set of five errors, the port is taken out of service for one minute. If five more CRC errors are received within 15 minutes of the last five, the port is taken out of service for 15 minutes.

   This error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

   - Check the wiring to the endpoints or the adjunct.
   - If the problem persists, replace the endpoints or adjuncts, or escalate the problem.

h. This error occurs when the BRI Port Local TDM Loop Around Test (#619) fails. Run the Long Test Sequence, and pay particular attention to the results of Test #619.

   There are no Test to Clear Values for the following error types. The error types are simply provided as additional data that may prove useful while troubleshooting.

i. This error occurs when a Layer 1 Transmission error is detected for the port. Run the Long Test Sequence, and pay particular attention to the results of the Layer 1 Transmission Error Counter Test (#624).

j. A BRI port supports up to three Terminal Endpoint Identifiers (TEIs). This error occurs when the switch receives a request for a fourth TEI on a port. Check the number of endpoints administered for this port.

k. This error occurs when an SPID initialization request is made from an endpoint and the switch determines that the SPID value is invalid or is a duplicate of another SPID that is already initialized at Layer 3 on the port. Check the administration of the endpoints.

l. This error occurs when the circuit pack detects an overflow of its receive buffers. Run the Long Test Sequence, and pay particular attention to the results of the Receive First In First Out (FIFO) Overflow Error Counter Test (#625).

m. This error occurs when the BRI Port Local LAN Loop Around Test (#618) fails. Run the Long Test Sequence, and pay particular attention to the results of Test #618.

n. This error most likely occurs when the Terminal Endpoint Identifier (TEI) administered for the ASAI or AT&T endpoint does not match the TEI administered in the ASAI or AT&T adjunct. Check the switch administration of the TEI against that of the adjunct, and make sure that both are using the same TEI.

o. Indicates that sets on the port do not support Layer 3 initialization. Consult the Service Set documentation.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#617)		X	D
BRI Port Local LAN Loop Around Test (#618)		X	D
BRI Port Local TDM Loop Around Test (#619)		X	D
Electronic Power Feed Restoral Test (#620)	X	X	ND
Level 1 Status Inquiry Test (#621)	X	X	ND
Electronic Power Feed Inquiry Test (#622)	X	X	ND
CRC Error Counter Test (#623)		X	ND
Layer 1 Transmission Error Counter Test (#624)		X	ND
Receive FIFO Overflow Error Counter Test (#625)		X	ND
Clear Error Counters (#270)	X	X	ND

1 D = Destructive; ND = Nondestructive

Note:

The NPE Crosstalk Test and the BRI Port Local TDM Loop Around Test are not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT.

NPE Crosstalk Test (#617)

This test is destructive.

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port’s NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port’s Long Test Sequence and takes approximately 20 to 30 seconds to complete. Crosstalk testing is performed on both B-channels (B1 and B2) associated with a BRI port. If this test fails on either channel, any endpoints connected to the port are taken out-of-service.

This test is not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT because the B-channels associated with the port are not used by ASAI or AT&T adjuncts.

Table 11-35. TEST #161 Loop Around Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension or trunk group/member number of the port. Use the **status bri-port PCSSpp** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) Wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status station** command for the station associated with this port and determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

Continued on next page

Table 11-35. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	This test is not valid for this type of translation. Ports administered as "ASAI" or "ADJK" can not run this test, because the B channels associated with the port are not used by ASAI or AT&T Adjunct Links. This is a normal condition.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1, 2	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. Error code 1 indicates that the NPE Crosstalk Test failed on Channel B1. Error code 2 indicates that the NPE Crosstalk Test failed on Channel B1. 1. Replace circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. To be sure that this is not an intermittent problem, repeat this test a maximum of 10 times to make sure it continues to pass. 2. If complaints still exist, examine the station, connections, and wiring.

BRI Port Local LAN Loop Around Test (#618)

This test is destructive.

This test, which verifies the connectivity of a BRI port across the LAN Bus, executes only if the port is out-of-service. The test aborts if calls associated with the port are in-progress. Failures of this test indicate either on-board faults associated with the BRI-PORT hardware on the circuit pack or problems with the LAN Bus, which is used to form connectivity between the switch and the BRI-PORT.

The dotted lines in Figure 11-9 show how a Loop Around Test is performed across the Packet Bus for the D-channel.

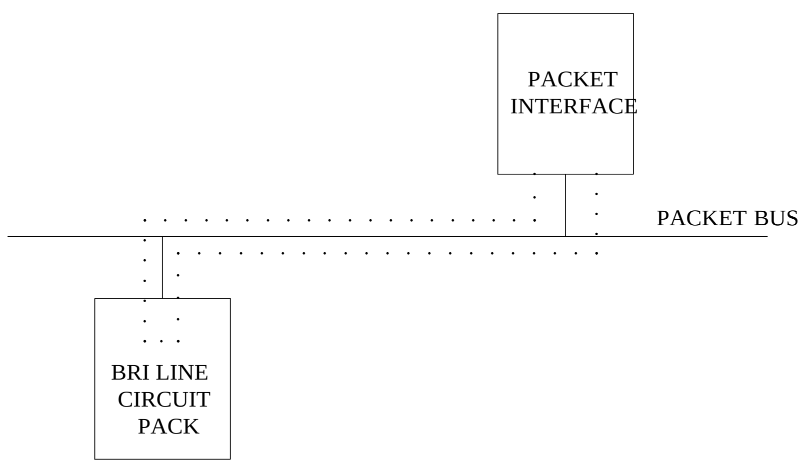

Figure 11-9. Path of the BRI Port Local LAN Loop Around

Table 11-36. TEST #618 BRI Port Local LAN Loop Around

Error Code	Test Result	Description/ Recommendation
1015	ABORT	The port is not in the out-of-service service state. 1. Display the BRI Port Status form via the **status bri-port PCSSpp** command to determine which stations or adjuncts are on this port. 2. Use the extension shown on this form in the **status station** command to determine if the station or adjunct is in use. 3. If it is in use, wait until it is idle, and then busyout the port (using the **busyout port PCSSpp** command) to place it in the out-of-service state and repeat this test. **WARNING:** *Since the "busyout" command is destructive, execution of this command prior to the port being idle causes all calls associated with BRI endpoints and all transactions associated with ASAI or AT&T adjuncts on the port to be torn down. Note that third party calls established by an ASAI or AT&T adjunct remain connected even though the port is taken out-of-service.*
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. 1. Follow the repair procedures for the PKT-CTRL. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

Continued on next page

Table 11-36. TEST #618 BRI Port Local LAN Loop Around — *Continued*

Error Code	Test Result	Description/ Recommendation
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Loop Around Test has failed. 1. If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the board are not in use. Reset the circuit pack by issuing the **busyout board PCSS** and the **reset board PCSS** commands. 2. If the test fails again, execute **test pkt P** on the G3MT terminal. If this fails, follow failure procedures in PKT-BUS section. 3. If tests executed in Step 2 pass, the problem is local to the BRI board. Replace the circuit pack.
	PASS	The BRI Port Local LAN Loop Around Test has passed.

BRI Port Local TDM Loop Around Test (#619)

This test is destructive.

This test verifies the connectivity of a BRI port across the TDM Bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

This Loop Around Test runs a series of individual tests on the two B-channels (B1 and B2) associated with the port. It is a collection of the following:

- A Loop Around Test across the TDM Bus for B1.
- A Conference Circuit Test for B1.
- A Loop Around Test across the TDM Bus for B2.
- A Conference Circuit Test for B2.

The tests are run in the above order. If one fails, the remaining tests in the sequence are not executed. An error code is returned at that point.

This test is not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT because the B-channels associated with the port are not used by ASAI or AT&T adjuncts.

The dotted lines in Figure 11-10 show how a Loop Around Test is performed for the B-channels. The figure shows a terminal connected to a BRI line board using a TN556. If a TN2198 is used, the terminal would be connected to a NT1, and the NT1 to the BRI board.

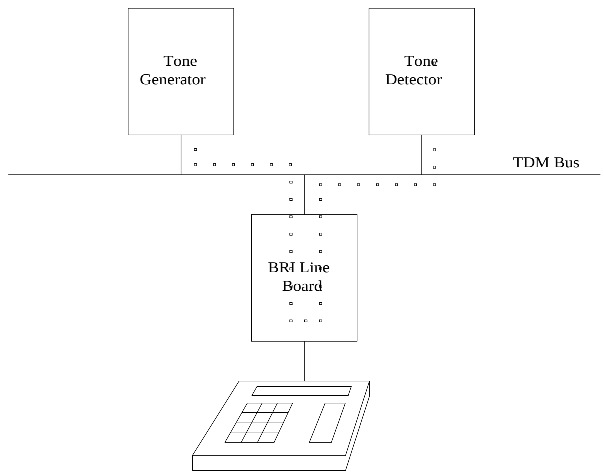

Figure 11-10. Path of the BRI Port Local TDM Loop Around

Table 11-37. TEST #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description/ Recommendation
1000	ABORT	The system resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension or trunk group/member number of the port. Use the **status bri-port PCSSpp** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) Wait until the port is idle before retesting. 1. If the port is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-37. TEST #619 BRI Port Local TDM Loop Around — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM Bus errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status station** command for the station associated with this port and determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as “ASAI” or “ADJK” can not run this test, because the B channels associated with the port are not used by ASAI or AT&T Adjunct Links. This is a normal condition.

Continued on next page

Table 11-37. TEST #619 BRI Port Local TDM Loop Around — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received from the BRI-LINE circuit pack within the allowable time period. 1. If this result occurs repeatedly, attempt to reset the circuit pack if the other ports are not in use. Reset the circuit pack by issuing the **busyout board PCSS** and the **reset board PCSS** commands. 2. If this result occurs again, replace the circuit pack.

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Table 11-37. TEST #619 BRI Port Local TDM Loop Around — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2103	ABORT	The system could not make the conference connection for the test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1, 2	FAIL	As stated previously, this test runs a TDM Loop Around Test on each B-channel. This indicates that the loop around failed on one of the channels. Error Code 1 indicates that the TDM Loop Around Test failed on B1. Error Code 2 indicates that the TDM Loop Around Test failed on B2.
7, 8	FAIL	As stated previously, this test runs a Conference Circuit Test on each B-channel. A failure here indicates that one of these conference tests failed; Error Code 7 means that the test failed on B1; Error Code 8 means that the test failed on B2. 1. If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the circuit pack are not in use. Reset the circuit pack by issuing the **busyout board PCSS** and the **reset board PCSS** commands. 2. If the test fails again, replace the circuit pack.
	PASS	The BRI Port Local TDM Loop Around Test has passed.

Electronic Power Feed Restoral Test (#620)

This test attempts to restore the Electronic Power Feed (EPF) on an ISDN-BRI port twice. In this test, the processor requests that the EPF be turned on for a given port. An attempt is made to turn on the power unit to the station or adjunct. If no current is being drawn by a station, this probably indicates that the station is not connected. No current being drawn by an adjunct is the normal condition. If an overcurrent condition is sensed (that is, too much current is being drawn), this condition may indicate a short in the wiring to the endpoint or adjunct. Depending on what condition is sensed, a message is returned stating that either the EPF was turned on successfully with no problems or that an overcurrent condition is sensed. This response is reported by the Electronic Power Feed Inquiry (#622), which follows in the testing sequence. EPF Restoral is attempted again by this test five seconds later. This test always passes for the TN2198 because it has no EPF. This test will always abort when run on the TN2208.

Table 11-38. TEST #620 Electronic Power Feed Restoral

Error Code	Test Result	Description / Recommendation
1005	ABORT	This test is not valid for this port type. The TN2208 does not have an electronic power feed, and the test will abort.
2012	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The EPF Test passed. The message to turn on the power feed to the station or the adjunct was successfully sent to the port. 1. Although this test should not return a fail result, after running this test, the Error Log should be checked for any entries with error type 257 to examine the real results of this test. 2. An error type of 257 in the Error Log indicates some problem with the power to the station or the adjunct. Check for a short in the wiring, a damaged jack, a defective voice terminal or adjunct, or an incorrect type of terminal.

Level 1 Status Inquiry Test (#621)

This test determines the state of the transmission facility of a BRI port at the physical layer (that is, Level 1). Level 1 can be in one of three possible states: Activated, Pending Activation, or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state the Level 1 interface can communicate with the BRI endpoint or ASAI or AT&T adjunct administered on this port. This test passes if the state of Level 1 (L1) is Activated. This test also passes if software has taken this port out of service. See the description of the Level 1 "Deactivated State" below for more details.

The Pending Activation state indicates a problem with the endpoints or adjunct, the wiring to the sets or adjunct, or the BRI-LINE circuit pack. When in this state, the Level 1 interface is either not receiving any L1 framing from the endpoint or adjunct (Endpoint Idle), or it is communicating with the endpoint or adjunct but cannot transition to the Activated state (Endpoint Active).

The Deactivated state indicates a problem with the BRI-LINE circuit pack. When in this state, the Level 1 interface is idle and is not trying to communicate with the BRI endpoints or adjunct. When an ISDN-BRI port is placed in the out-of-service state, Level 1 is also put into the Deactivated state. This could be due either to the system detecting a fault with the port or to a **busyout port PCSSpp** request.

Table 11-39. TEST #621 Level 1 Status Inquiry

Error Code	Test Result	Description/ Recommendation
1187	ABORT	The board, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port and BRI-BD (board busied out). If this error type is present for BRI-PORT only, then release the port via the **release port pp** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the board via the **release port PCSS** command and run the test again. **NOTE:** When you release a port, you release all ports associated with it. If certain ports still need to be busied out, use the **release port PCSSpp** command to busy them out. 2. Make sure the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

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Table 11-39. TEST #621 Level 1 Status Inquiry — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	Received a status of Level 1 Pending Activation-Endpoint Idle which indicates a problem with the BRI endpoint or ASAI or AT&T adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. For the TN2198, received a status of Level 1 Pending Activation. U interface down, which indicates a problem with a connection between the switch and the NT1. **NOTE:** An NT1 is a 2- to 4-wire converter that is used to connect 4-wire AT&T terminals to a 2-wire TN2198 circuit pack. The NT1 also has status lamps to determine the health of the unit. 1. For the TN556 or TN2208, verify that an endpoint is connected to the port. If an endpoint is connected to the port, then proceed to step 2. For the TN2198 verify that the connections are good between the switch and the NT1. Verify that the NT1 has power. 2. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. If a TN2198 is used, the set must have been plugged in for at least 15 seconds before it will stabilize. Execute the **test port PCSSpp** command, and review the results of the Level 1 Status Inquiry Test to verify the repair. If this test is still failing, proceed to Step 3. 3. For BRI endpoints, replace the BRI endpoint(s) connected to the port or the NT1 if a TN2198 is used. For ASAI or AT&T adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the manufacturers repair procedures. Then execute the **test port PCSSpp** command and review the results of the Level 1 Status Inquiry Test to verify repair. If this test is still failing, proceed to Step 4. 4. Escalate the problem to the next tier.

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Table 11-39. TEST #621 Level 1 Status Inquiry — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	For the TN556 or TN2208, received a status of Level 1 Pending Activation-Endpoint Active which indicates a problem with the BRI endpoint or ASAI or AT&T adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. For the TN2198, received a status of Level 1 Pending Activation. U interface up S/T interface down, which indicates a problem with the NT1 or the wiring between the NT1 and the BRI endpoint (S/T interface). 1. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Execute the **test port PCSSpp** command, and review the results of the Level 1 Status Inquiry test to verify the repair. If this test is still failing, proceed to Step 2. 2. For BRI endpoints, try replacing the BRI endpoint(s) connected to the port. For ASAI or AT&T adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the recommended repair procedures of the manufacturer. Then execute the **test port PCSSpp** command, and review the results of the Level 1 Status Inquiry test to verify repair. If this test is still failing, proceed to Step 3. 3. Escalate the problem to the next tier.

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Table 11-39. TEST #621 Level 1 Status Inquiry — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	Received a status of Level 1 Deactivated; the port is out-of-service. 1. Issue the **status bri-port PCSSpp** command to verify that the service state of the port is out-of-service. If the service state of the port is not out-of-service, escalate the problem to the next tier. Otherwise, proceed to Step 2. 2. If the port has been placed out-of-service via the **busyout port PCSSpp** command, try releasing the port by executing the **release port PCSSpp** command. Then issue the **test port long PCSSpp** command, and review the results of Level 1 Status Inquiry test. If this test is still failing, proceed to Step 3. 3. After executing the **test port long PCSSpp** command, review the results of all the tests. Follow the repair procedures for any tests that fail. Verify repair of the problem by executing the **test port PCSSpp** command and by determining that the Level 1 Status test passes. If the test continues to fail for this reason, proceed to Step 4. 4. Escalate the problem to the next tier.
4	FAIL	For the TN2198 only: Received a status of Level 1 Pending Activation, the NT1 has a loss of power indicating a problem with the NT1. 1. For the NT1 follow the manufacturers recommended repair procedures. 2. Execute the **test port PCSSpp** command, and review the results of the Level 1 Status Inquiry test to verify the repair. If the test is still failing proceed to Step 3. 3. Escalate the problem to the next tier.
	PASS	This test indicates that Level 1 is activated, or that software has taken the port out of service.

Electronic Power Feed Inquiry (#622)

This test queries the BRI-LINE circuit pack for the status of the Electronic Power Feed (EPF) supplied to a BRI endpoint or an ASAI or AT&T adjunct. If the EPF is on and no overcurrent condition exists, this test passes. All other states are not normal and indicate a problem with the endpoint or adjunct, the wiring to the endpoint or adjunct, or the BRI-LINE circuit pack. This test is not run on the TN2208 circuit pack or the TN2198 and will always return a pass for a TN2198. The TN2208 has no power feeds.

Table 11-40. TEST #622 Electronic Power Feed Inquiry

Error Code	Test Result	Description/ Recommendation
1005	ABORT	This test is not valid for this port type. Ports on the TN2208 cannot run this test because this board does not have an electronic power feed.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-40. TEST #622 Electronic Power Feed Inquiry — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The BRI-LINE circuit pack reports that it has detected an overcurrent condition and has turned off the EPF. 1. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Check the endpoints and replace one or both sets if the sets are drawing too much current. Execute the **test port PCSSpp** command and review the results of the EPF Inquiry Test to verify the repair. If this test is still failing, proceed to Step 2. 2. Execute the **test port PCSSpp** command, and review the results of the Level 1 Status Inquiry Test. If this test is also failing, then follow the repair procedure for the Level 1 Status Inquiry Test. Otherwise, escalate this problem to the next tier.
	PASS	The Electronic Power Feed Inquiry Test reports that the EPF is on.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal System Error.

Layer 1 Transmission Error Counter Test (#624)

This test reads and clears the BRI port's Layer 1 Transmission error counter maintained on the BRI-LINE circuit pack. This counter is incremented by the circuit pack when it detects a Layer 1 transmission problem. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error is most likely due to a problem with the wiring or the endpoint or adjunct (verify that the wiring meets the configuration rules defined in *DEFINITY Communications System Generic 1 and Generic 3i Wiring*, 555-204-111). It does not indicate a problem with the ISDN-BRI circuit pack. This test is useful for verifying the repair of the problem.

Table 11-41. TEST #624 Layer 1 Transmission Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.

Continued on next page

Table 11-41. TEST #624 Layer 1 Transmission Error Counter Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate necessary system resources to run test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
value	FAIL	The BRI-LINE circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, review the results of other tests in the Long Test Sequence. Pay particular attention to the results of the Level 1 Status Inquiry test. Follow repair procedures for any of the executed tests if they fail. Otherwise, go to the next step. 3. If the tests for the endpoints or adjunct pass and the Layer 1 Transmission Error Counter Test continues to fail, check the wiring to the endpoints or adjunct. If the wiring appears to be fine, escalate the problem.
	PASS	The Layer 1 Transmission error counter was read correctly and has a value of 0.

Receive FIFO Overflow Error Counter Test (#625)

This test reads and clears the BRI port's Receive FIFO Overflow error counter maintained on the BRI-LINE circuit pack. This counter is incremented by the circuit pack when it detects an overflow of its receive buffers. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is non-zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error can occur if signaling frames are being received from the Packet Bus at a rate sufficient to overflow the receive buffers on the circuit pack for a port OR if a hardware fault is causing the receive buffers not to be emptied properly by the circuit pack. This test is useful for verifying the repair of the problem.

Table 11-42. TEST #625 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. 1. If the test aborts repeatedly a maximum of five times, reset the circuit pack via the **busyout board PCSS** and **reset board PCSS** commands. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
value	FAIL	The BRI-LINE circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, run the Long Test Sequence and pay particular attention to the Loop Around Tests (#618 and #619). See the repair procedures for the executed test if it fails. Otherwise, go to the next step. 3. Replace the circuit pack.

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Table 11-42. TEST #625 Receive FIFO Overflow Error Counter Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Receive FIFO Overflow error counter was read correctly and has a value of 0.

Clear Error Counters Test (#270)

This test is not an actual test in the strict sense of the word. There are various error counters associated with each BRI-PORT/ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT. This test clears those counters and triggers the auditing of Terminal Endpoint Identifier (TEI) values and layer 3 reinitialization. This test is used only to send messages to the BRI-PORT/ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT and, therefore, should neither abort nor fail.

Table 11-43. TEST #270 Clear Error Counters

Error Code	Test Result	Description/ Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The message to clear the error counters of the BRI-Port/ABRI-Port/ATT-PORT/LGATE-PT/ATTE-PT has been sent.

BRI-SET, ASAI-ADJ, BRI-DAT

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
BRI-SET	WARNING[2]	test station extension l, test data-module extension	ISDN-BRI Set
ASAI-ADJ	MAJOR[2]	test station extension	ASAI-Adjunct
ASAI-ADJ	MAJOR[2]	test data-module extension	ASAI-Adjunct
ASAI-ADJ	WARNING[3]	test data-module extension	ASAI-Adjunct
ATT-ADJ	MAJOR[2]	test station extension	AT&T-Adjunct
ATT-ADJ	MAJOR[2]	test station extension	AT&T-Adjunct
ATT-ADJ	WARNING[3]	test station extension	AT&T-Adjunct
LGATE-AJ	MAJOR[2]	test station extension	Ethernet ASAI-Adjunct
LGATE-AJ	MAJOR[2]	test station extension	Ethernet ASAI-Adjunct
LGATE-AJ	WARNING[3]	test station extension	Ethernet ASAI-Adjunct
ATTE-AJ	MAJOR[2]	test station extension	Ethernet AT&T-Adjunct
ATTE-AJ	MAJOR[2]	test station extension	Ethernet AT&T-Adjunct
ATTE-AJ	WARNING[3]	test station extension	Ethernet AT&T-Adjunct
BRI-DAT		test data-module	

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01). The alternate name field contains the extension of the endpoint. This field is used to distinguish between endpoints on the same port.

2 The alarm level for ASAI and AT&T adjuncts may be administered using the **set options** command. The alarm level can be set independently for Off-Board and On-Board alarms to WARNING, MINOR, or MAJOR for all ASAI and AT&T adjuncts in the system.

3 Alarming for an ASAI and AT&T adjuncts is disabled if the adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm are logged against the endpoint. Busying out and releasing the ASAI station or ADJLK station will clear the alarm.

CAUTION:

A detailed flowchart for isolating and resolving Packet Bus faults is included *in Chapter 9, "Packet Bus Fault Isolation and Correction". this flowchart, along with the other information presented in the chapter, can help in resolving problems that involve more than a single station or circuit pack. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to reference Chapter 9, "Packet Bus Fault Isolation and Correction" in addition to the relevant MO documentation.*

WARNING:

If a significant Packet Bus failure occurs, errors and alarms may not be logged as expected for BRI-SET/BRI-DAT/ASAI-ADJ/ATT-ADJ/LGATE-AJ/ATTE-AJ. Conditions under which this occurs are detailed in the ""Maintenance of the Packet Bus" section of Chapter 9, "Packet Bus Fault Isolation and Correction".

The TN2208 ESAI MFB provides DEFINITY with an Ethernet interface to Adjunct-Switch Application Interface (ASAI) and AT&T adjuncts (for example, CONVERSANT® Voice System). This circuit pack contains 8 ports of line circuit interface, each of which operates with two B-channels (referred to as B1 and B2 throughout this section) and one D-channel as specified in the AT&T ISDN-BRI Specification. In this context, the term ``ISDN-BRI port'' is used to refer collectively to ports on the TN2208 MFB circuit pack which is connected to ASAI or AT&T adjuncts. The TN2208 ESAI MFB is handled by switch software as it is an ISDN BRI compatible board and all maintenance actions referring to ASAI and AT&T Adjunct Links in this section apply.

In G3iV1.1-286 and G3iV2-386, two types of ISDN-BRI endpoints may be connected to ISDN-BRI (ISDN Basic Rate Interface Line) TN556 and TN2198 circuit packs: ISDN-BRI station endpoints, ASAI (Adjunct-Switch Application Interface) and AT&T adjuncts (for example CONVERSANT® Voice System). These circuit packs contain 12 ports of line circuit interfaces, each of which operates at 192 kilobits per second (kbps) with two B-channels and one D-channel as specified in the AT&T ISDN-BRI specification (PUB 801-802-100). For BRI endpoints, each B-channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B-channels are not used by ASAI or AT&T adjuncts. The D-channel is used for conveying signaling between the switch and a BRI endpoint(s) or ASAI or AT&T adjuncts. Each ISDN-BRI D-channel is connected to the switch processor and the ISDN-BRI port through the PKT-CTRL (Packet Control) and the PKT-BUS (Packet Bus).

ISDN-BRI endpoints come in a number of configurations. All endpoints require the D-channel to convey signaling information to the switch. A voice-only set requires only one B-channel. A voice and data-capable set requires both B-channels (one for voice and one for data). Therefore, each TN556 port can support either two voice-only sets or one voice and data-capable set. Only a single ASAI or AT&T adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 11-11 illustrates the physical connection (solid line) between an ISDN-BRI Circuit Pack and a voice or voice/data set. Each physical connection allows for two B-channels, as stated above, plus one D-channel. Each ISDN-BRI circuit pack can support up to 12 of these PHYSICAL connections to different voice and voice/data sets or ASAI and AT&T adjuncts.

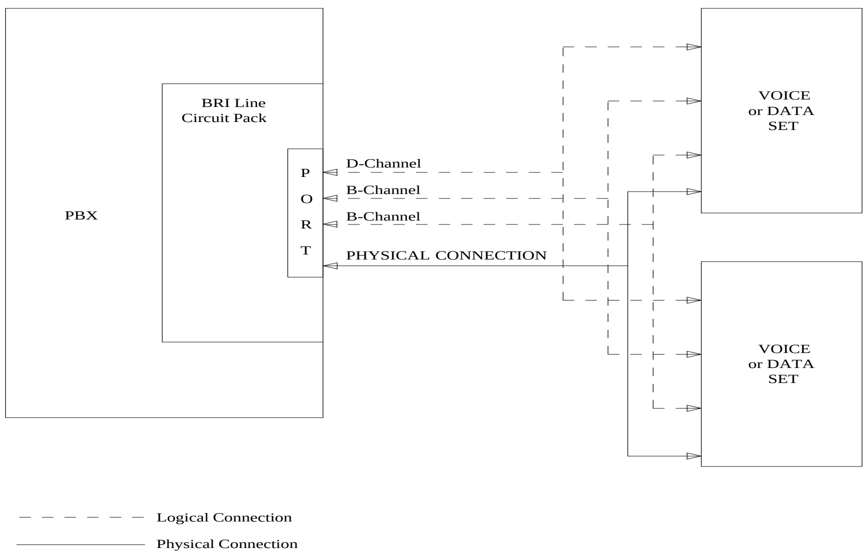

Figure 11-11. ISDN-BRI Set Interactions

This section contains the ISDN-BRI Set, ASAI Adjunct, and AT&T Adjunct Maintenance documentation. Some of the results of maintenance testing of the ISDN-BRI Set or the ASAI and AT&T Adjunct may be affected by the health of the ISDN-BRI circuit pack and Port. These interactions should be kept in mind when investigating the cause of ISDN-BRI Set problems.

Hardware Error Log Entries and Test to Clear Values

Table 11-44. BRI-SET/ASAI-ADJ Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level BRI-PORT	Alarm Level ABRI-PORT ATT-PORT LGATE-PORT ATTE-PT	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	Any	test BRI-SET or ASAI-ADJ ATT-ADJ LGATE-AJ ATTE-AJ
2(a)	2-10 2	None				
18	0	busyout station ext	WARNING	MAJOR/ WARNING[2]	OFF	release station <ext>
130(b)			WRN		ON	test port PCSS sh
257(c)	Any	BRI Layer 3 Query (#629)	WARNING	MAJOR/ WARNING[2]	OFF	test station ext r 2 test data-module ext r 2
351(d)	0	None		WARNING	OFF	busyout and release station
513(e)	0	None				
769(f)	0	None	WARNING	MAJOR	OFF	
2561(g)	0	None				
2562-2566(h)	0	None				
2567(o)	0	None				
2568(p)	0	None				
2817(i)	0	XID Test (#628)	WARNING	MAJOR/ WARNING[2]	OFF	test station ext r 2 test data-module ext r 2

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Table 11-44. BRI-SET/ASAI-ADJ Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level BRI-PORT	Alarm Level ABRI-PORT ATT-PORT LGATE-PORT ATTE-PT	On/ Off Board	Test to Clear Value
3073(j)	0	BRI Remote Loop Back (#627)	WARNING		OFF	test station ext l r 2 test data-module ext l r 2
3329(k)	Any	Signaling Link Status (626)	WARNING	MAJOR/ WARNING[2]	OFF	†
3584	0, 1	None				
3585-3839(i)	0	None				
3840-4095(m)(n)	0	None				

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. Errors of this type indicate violations of the ISDN-BRI signaling protocol; timers associated with certain Layer 3 messages have expired before a required response was received. In the following table, the aux data field indicates which timer has just expired. (For more information, refer to the AT&T ISDN-BRI Specification.)

Aux Data	Timer Type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)

Aux Data	Timer Type
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer 2 Failure timer)
16	TM100 (Management Information Message timer 1)
17	TM200 (Management Information Message timer 2)
102	TASAI (ASAI Routing Timer)

The switch sent a message to the endpoint which did not respond in the allotted time. This can happen occasionally due to failure of the point-to-point signaling link or because of a problem in the BRI endpoint or ASAI adjunct or AT&T adjunct. Execute the **test station extension sh** command and pay particular attention to the results of the BRI Layer 3 Query Test (#629). If this test fails, follow the repair procedure for Test #629.

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

c. This error occurs when the endpoint does not respond to the service state query message sent to the adjunct or the endpoint. This error causes an alarm to be raised. The alarm is retired when the switch receives a response to the service state query to the endpoint or the adjunct.

For BRI endpoints, the Aux Data field for this error contains "0." When it occurs, execute the **test station extension sh** command and pay particular attention to the results of the BRI Layer 3 Query Test (#629). If this test fails, follow the repair procedure for Test #629.

When this error occurs for an ASAI or AT&T adjunct, the Aux Data field indicates the state of the ASAI link or AT&T link and whether an invalid response or no response was received to the query from the switch, as shown in the following table:

Aux Data	ASAI Link State	Error
102	13-restarting	No response to RESTART message
104	13-restarting	Invalid response to RESTART message
152	13-restarted	No response to Layer 3 query
154	13-restarted	Invalid response to Layer 3 query
202	13-established	No response to Layer 3 query
204	13-established	Invalid response to Layer 3 query

(See "Status BRI-Port" in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for an explanation of the ASAI link states.)

For ASAI or AT&T adjuncts, the switch automatically queries the adjunct every two minutes (and therefore the Layer 3 Query Test is not executed for ASAI or AT&T adjuncts via a command issued from the G3MT terminal). While alarmed for this error, the switch momentarily (for five seconds) takes the associated port out-of-service every 15 minutes. This action is taken in an attempt to stimulate recovery actions to be taken by the adjunct.

When this error occurs for an ASAI or AT&T adjunct, the service technician should:

1. Execute the **test station extension** command, paying particular attention to any tests which fail, and perform the associated repair procedures for those tests.
2. Check the health of the adjunct by following the recommended repair procedures of the manufacturer of the adjunct if the preceding step does not resolve the problem.
3. The alarm condition persists and, if the above steps do not resolve the problem, follow normal escalation procedures.

d. This error and associated WARNING alarm are logged against an ASAI or AT&T endpoint when the adjunct has asked the switch to suspend Maintenance on the ASAI or AT&T endpoint. Busying out and releasing the ASAI station or ADJLK station will clear this alarm.

e. This error occurs when the endpoint sends more messages than the switch can handle. The switch suspends the reception of messages from the endpoint for a short period of time. There is no repair procedure for this error. If the condition persists, replace the endpoint.

f. This error occurs when the signaling link associated with a BRI endpoint has too much link establishment related traffic. This could occur if the signaling link is bouncing between assigned and established states. Software will suspend activity to this endpoint for 75 minutes when the endpoint is alarmed due to this problem (note that service suspension does not occur if the endpoint is an ASAI or AT&T adjunct). If this problem persists, replace the endpoint. If replacing the endpoint does not fix the problem, follow normal escalation procedures.

g. This error occurs when the ASAI-ADJ or ATT-ADJ or LGATE-AJ or ATTE-AJ message is not transmitted because the PKT-CTRL (Packet Control Circuit Pack) transmit buffers are exhausted. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI or AT&T adjunct. Attempt to resolve the problem by following the repair procedures for the PKT-CTRL. If these attempts fail, the problem should be escalated because re-engineering of the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

h. This error occurs when the ASAI message is not transmitted because the transmit buffer for the ASAI link is full, causing the link to be flow controlled. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI or AT&T adjunct. Attempt to resolve the problem by following the repair procedures issued by the manufacturer of the adjunct. If these attempts fail, the problem should be escalated because re-engineering of the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

i. This error indicates a problem with Layer 2 over the D-channel between the switch and the endpoint. When this error occurs, an alarm is raised against the station or adjunct. Execute the **test station extension short** command and pay particular attention to the results of the BRI XID Test (#628). If this test fails, follow the repair procedure for Test #628.

j. This error indicates a problem with the B-channel connection between the switch and the endpoint. When this error occurs, a warning alarm is raised against the endpoint. Execute the **test station extension l** command, and pay particular attention to the results of the BRI Remote Loop Back Test (#627). If this test fails, follow the repair procedure for Test #627.

k. This error occurs whenever the point-to-point signaling link to the endpoint goes down (except when it goes down because either the PKT-CTRL or the PKT-BUS has failed or has been busied out by system technician). When this error occurs, an alarm is raised against the endpoint or adjunct. Execute the **test station extension short** command and pay particular attention to the results of the Signaling Link Status Test (#626). If this test fails, follow the repair procedure for Test #626. The alarm is retired when the signaling link is reestablished to the endpoint or adjunct.

l. Certain ASAI protocol-specific cause codes are logged by switch software. The cause code can be determined from the following formula:

   If the error type is greater than 3712, then the ASAI cause code is equal to the error type minus 3712. This code was sent to the adjunct by the switch.

   If the error type is less than 3712, then the ASAI cause code is equal to the error type minus 3584. This code was sent to the switch by the adjunct.

   A description of the various ASAI cause values is contained in the Table 11-45. This table also contains recommended system technician actions associated with the cause value. Further information can also be found in the AT&T ASAI Specification (AT&T PUB 288-500-03). In addition, the Aux Data field of the Error Log entry contains additional diagnostic information.

Table 11-45. ASAI Cause Values

Code	Explanation	Recommendation
	SERVICE OR OPTION NOT AVAILABLE	
0	Unrecognized ASAIProtocol Operation	Requested ASAI protocol operation is not implemented by the switch or adjunct. Aux Data field of Error Log entry contains protocol identifier for unrecognized operation. 1. Consult switch and adjunct documentation to determine which set of operations is supported by the switch and the adjunct. Adjunct administration turning off operations not implemented by the switch may resolve the problem. 2. If Step 1 does not resolve the problem, escalate to the next tier.
40	Resources not available	No available internal resources to service switch or adjunct request. System transaction capacity for adjunct or switch is exceeded. 1. Re-engineering of adjunct services my be required. If problem persists, escalate problem to the next tier.
63	SERVICE OR OPTION NOT AVAILABLE	Requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resources. Potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. 1. Verify that no overlapping administration of switch resources (e.g., requesting notifications on a single domain by multiple adjuncts or multiple adjuncts attempting to control a single call) exists across all adjuncts connected to the switch. If overlaps exist, then readminister the adjuncts to guarantee that each adjunct is associated with a unique set of switch resources. 2. If Step 1 does not resolve the problem, escalate to the next tier.

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Table 11-45. ASAI Cause Values — *Continued*

Code	Explanation	Recommendation
	SERVICE OR OPTION NOT IMPLEMENTED	
79	SERVICE OR OPTION NOT IMPLEMENTED	Requested service or option (or combination of selected options) is not supported (implemented) in switch or the adjunct. 1. Consult switch and adjunct documentation to determine ASAI service and options supported by both switch and adjunct. Readministration of the switch-administered capabilities (see Customer Optional Feature Form) or those of the adjunct may be necessary to correct the problem. 2. If Step 1 does not provide the set of desired services due to deficient implementation, escalate the problem to the next tier.
	SWITCH ERROR CONDITIONS	
87	Internal switch audit	There is an inconsistency in switch data records. 1. There is no action needed since the switch has corrected the data inconsistency. 2. If a number of these errors continue to occur, then escalate to next tier.

m. Certain ISDN-BRI cause codes are logged by switch software. The cause code can be determined from the following formula:

   If the error type is greater than 3968, then the ISDN-BRI cause code is equal to the error type minus 3968. This code was sent to the endpoint by the switch.

   If the error type is less than 3968, then the ISDN-BRI cause code is equal to the error type minus 3840. This code was sent to the switch by the endpoint.

   A description of the various ISDN-BRI cause values is contained in Table 11-46. This table also contains recommended system technician actions associated with the cause value. Further information can also be found in the AT&T ISDN-BRI Specification (AT&T PUB 801-802-100). In addition, the Aux Data field of the Error Log entry contains additional diagnostic information.

n. Error 3847 indicates that sets on the port do not support level 3 initialization. Consult the Set Service documentation

o. For the Error 2567 indicates that the version of ASAI is not supported, check version of the software running on the ASAI or AT&T adjunct.

p. For Error 2568 indicates that the adjunct id is invalid, check the vender id or software running on the AT&T adjunct.

Table 11-46. ISDN-BRI Cause Values

Code	Explanation	Recommendation
	CHANNEL IN USE	
1		Requested channel is in use by another station on the BRI-PORT. (Not applicable for ASAI or AT&T adjuncts.) For BRI endpoints: 1. Try to originate a call to or from this port. 2. If the error persists, busy out and release the port. 3. If the problem still persists, replace stations on the port. 4. If the problem still persists, escalate to the next tier.

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Table 11-46. ISDN-BRI Cause Values — *Continued*

Code	Explanation	Recommendation
	SWITCH RESOURCES NOT AVAILABLE	
34	No circuit or channel available	A resource on the switch is unavailable for a call. For BRI endpoints: This cause value is not logged. For ASAI or AT&T Adjuncts: This condition means that there are no available trunks for an outgoing call request. 1. Verify that the adjunct is administered to support the trunk capabilities of the switch. 2. Investigate trunk group status by issuing **status trunk** commands from the SAT or by requesting a trunk group query or queries from the adjunct. 3. Perform trunk diagnostic procedures outlined in this manual. 4. If step 3 does not resolve the problem, escalate to the next tier.
42	Switch Equipment Congestion	Switch takes control to limit received traffic. For BRI endpoints: This cause value is not logged. For ASAI or AT&T Adjuncts: 1. See CallVisor protocol reference manual. 2. If step 1 does not resolve the problem, escalate to the next tier.
	SERVICE OR OPTION NOT AVAILABLE	

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Table 11-46. ISDN-BRI Cause Values — *Continued*

Code	Explanation	Recommendation
50	Requested Facility Not Subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. For BRI endpoints: 1. Verify the switch administration of endpoint using either the **display station** or **display data-module** commands. 2. If Step 1 does not resolve the problem, refer to the endpoint's service manual and verify administration on the endpoint. 3. If Step 2 does not resolve the problem, escalate to the next tier. For ASAI adjuncts: 1. Display the Customer Optional Features Form (administration screen) on the switch to determine which ASAI capabilities are turned on in the switch. 2. Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administered capabilities, then readminister the switch and/or the adjunct to establish a consistent set of desired capabilities on both the switch and the adjunct. 3. If Step 2 does not resolve the problem, escalate to the next tier. For AT&T adjuncts: 1. Display the Customer Optional Features Form (administration screen) on the switch to determine if the AT&T adjunct is set enabled on in the switch. 2. If error type 2567 or 2568, verify the AT&T adjunct version, and readminister if needed. 3. If step 2 does not fix the problem, escalate to the next tier of support.

Continued on next page

Table 11-46. ISDN-BRI Cause Values — *Continued*

Code	Explanation	Recommendation
58	Bearer Capability Not Presently Available	Requested bearer capability is implemented, but not administered. No B-channel administered. See recommendation 50 above.
	SERVICE OR OPTION NOT IMPLEMENTED	
65	Bearer Service Not Implemented	Requested service not implemented in switch or endpoint.
69	Requested Facility Not Implemented	Requested service not supported in switch or endpoint. 1. Consult switch and endpoint documentation to determine service support. 2. If Step 1 does not resolve the problem, escalate to the next tier.
	ADJUNCT/SWITCH ERROR CONDITIONS	
81	Invalid CRV	An invalid CRV was sent by the adjunct. 1. This may indicate a CRV inconsistency between the switch and the adjunct. See the CallVisor protocol reference manual. 2. If step 1 does not resolve the problem, escalate to the next tier.

System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system and deciding which ones to address, always investigate errors associated with the circuit pack and port first. Clearing these error codes first may also clear errors generated against the endpoint. When all circuit pack and port errors have been cleared, and errors still exist against the endpoint, always investigate errors in the order they are presented in the table below. By clearing error codes associated with the *Signaling Link Status Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Status Test (#626)	X	X	ND
BRI XID Test (#628)	X	X	ND
BRI Layer 3 Query (#629)	X (a)	X (a)	ND
BRI Remote Loop Back (#627)		X (a)	ND
BRI Set Audits (#630)	X (a)	X (a)	ND
BRI Vendor ID Test (#631)		X (a)	ND
BRI Model/Vintage ID Test (#632)		X (a)	ND

1 D = Destructive; ND = Nondestructive

Note:

a. Will execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

Signaling Link Status Test (#626)

This test determines the current status of the signaling link. This test passes if the link is "bound" to an endpoint and fails if the link is "not bound."

The definition of the term "bound" for a link depends upon the type of endpoint and may depend on the successful completion of procedures at both Layers 2 and 3 of the protocol. The definition of "bound" for each type of endpoint is as follows:

- **BRI endpoints administered for MIM (management information messages) initialization (multipoint):**

  NOTE:
  An MIM is a level 3 message that conveys management and maintenance information between a communications system and a BRI terminal.

  For endpoints of this type, the signaling link is "bound" when the link is connected at Layer 2 and the link has been associated with an endpoint, [that is, the endpoint has completed SPID initialization (L3 established)].

- **ASAI adjuncts and BRI endpoints not administered for MIM initialization (point-to-point):**

  For endpoints of this type, the signaling link is "bound" when the link is connected at Layer 2 (L2 established).

For all endpoint types, a signaling link becomes "unbound" when it is disconnected at Layer 2. For BRI endpoints supporting MIM initialization, a signaling link may also become "unbound" if a subsequent attempt to perform SPID initialization on a "bound" link fails, (that is, wrong SPID is entered into the endpoint by the user).

Table 11-47. TEST #626 Signaling Link Status Test

Error Code	Test Result	Description/ Recommendation
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-47. TEST #626 Signaling Link Status Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The PKT-CTRL is out-of-service. 1. Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. 2. If Step 1 does not resolve the problem, escalate to the next tier.
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus in the PPN. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

Continued on next page

Table 11-47. TEST #626 Signaling Link Status Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. 2. If this error type is present for BRI-SET only, then release the station via the **release station** command. a. If this error type is present for BRI-PORT and BRI-SET, then release the port via the **release port PCSSpp** command and run the test again. b. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the **release port PCSSpp** command and run the test again. If the error is present for BRI-SET only, then release the circuit pack via the **release port PPCSS** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the **release board PPCSS** command and run the test again. **NOTE:** When you release the circuit pack, you release all ports associated with it. If certain ports still need to be busied out, use the **release port PCSSpp** command to busy them out. 3. Make sure the terminal is connected. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.
2012	ABORT	Internal System Error.

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Table 11-47. TEST #626 Signaling Link Status Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1113	FAIL	The signaling link is not "bound" to the adjunct or endpoint. For BRI endpoints supporting MIM initialization, this error indicates that the endpoint has not been bound to a signaling link (that is, SPID initialization has not been completed). Since the signaling link associated with the endpoint is not identified until SPID initialization completes, this error does not imply that the signaling link is connected or disconnected at Layer 2 nor does it provide the status of TEI assignment for the endpoint. For ASAI adjuncts and BRI endpoints not supporting MIM initialization, this error indicates that the link is disconnected at Layer 2. Since the signaling link associated with the endpoint has been identified via administration, the link is only "unbound" from the endpoint when it is disconnected. 1. Execute the **status bri-port PCSSpp** command and refer to the associated procedures for this command contained in the BRI-PORT (ISDN-BRI Port) Maintenance documentation. 2. If the test continues to fail, escalate the problem.
	PASS	The signaling link is connected at Layer 2 and "bound" to the BRI endpoint or ASAI adjunct.

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Table 11-47. TEST #626 Signaling Link Status Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1113	FAIL	The signaling link is not "bound" to the adjunct or endpoint. For BRI endpoints supporting MIM initialization, this error indicates that the endpoint has not been bound to a signaling link (that is, SPID initialization has not been completed). Since the signaling link associated with the endpoint is not identified until SPID initialization completes, this error does not imply that the signaling link is connected or disconnected at Layer 2 nor does it provide the status of TEI assignment for the endpoint. For ASAI adjuncts and BRI endpoints not supporting MIM initialization, this error indicates that the link is disconnected at Layer 2. Since the signaling link associated with the endpoint has been identified via administration, the link is only "unbound" from the endpoint when it is disconnected. 1. Execute the **status bri-port PCSSpp** command and refer to the associated procedures for this command contained in the BRI-PORT (ISDN-BRI Port) Maintenance documentation. 2. If the test continues to fail, escalate the problem.

BRI Remote Loop Back Test (#627)

This test checks the integrity of a circuit switched B-channel connection between the switch and the endpoint.

In this test, the endpoint is put in the "maintenance busy" state to prevent the switch from issuing calls to the endpoint during the test. An application message containing a loop back activate request for the appropriate B-channel is sent to the endpoint. The endpoint responds with a loop back activated response. Maintenance then sends data to the endpoint over the B-channel under test. Since the B-channel is looped back at the endpoint, maintenance should receive the data that it sent. If no data is detected, the test fails. An application message containing a loop back deactivate request is then sent to the endpoint to terminate the remote loop back test. The endpoint responds with an MIM message containing a loop back deactivate response. Maintenance then releases the endpoint so that it is available to terminate calls.

This test is not executed for ASAI adjuncts because adjuncts do not support MIMs upon which this test is based.

Table 11-48. TEST #627 BRI Remote Loop Back

Error Code	Test Result	Description/ Recommendation
1000	ABORT	Could not seize the endpoint or B-channels for test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	The endpoint's MIMs Supported field is administered to "no." 1. Use the **change station extension** command to change parameter only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.

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Table 11-48. TEST #627 BRI Remote Loop Back — *Continued*

Error Code	Test Result	Description/ Recommendation
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Use the **test port PCSSpp long** command to clear any errors which prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status Test (#626) which is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. 3. If the XID Test continues to abort, escalate the problem.
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. 1. Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. 2. If Step 1 does not resolve the problem, escalate to the next tier.
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus in the PPN. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

Continued on next page

Table 11-48. TEST #627 BRI Remote Loop Back — *Continued*

Error Code	Test Result	Description/ Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. 2. If this error type is present for BRI-SET only, then release the station via the **release station** command. a. If this error type is present for BRI-PORT and BRI-SET, then release the port via **release port PCSSpp** command and run the test again. b. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the **release port PCSSpp** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the **release board PPCSS** command and run the test again. If the error is present for BRI-SET only, then release the circuit pack via the **release port PPCSS** command and run the test again. **NOTE:** When you release the circuit pack, you release all ports associated with it. If certain ports still need to be busied out, use the **release port PCSSpp** command to busy them out. 3. Make sure the terminal is connected. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.
2012	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-48. TEST #627 BRI Remote Loop Back — *Continued*

Error Code	Test Result	Description/ Recommendation
2068	ABORT	The endpoint has rejected the switch sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Loop Back Testing. 1. Use the **change station extension** command and change the MIMs Supported field to "no."
2069	ABORT	The endpoint has returned an error response to the application message sent by the switch.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	FAIL	No loop back activation or deactivation response is received from the endpoint. 1. Consult the endpoint documentation to determine if ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use **change station extension** command to change the MIMs Supported? field to "no." Use the **busyout station extension** and **release station extension** commands to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. 2. If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.

Continued on next page

Table 11-48. TEST #627 BRI Remote Loop Back — *Continued*

Error Code	Test Result	Description/ Recommendation
2071	FAIL	No data is detected on Channel B1 during loop back.
2072	FAIL	No data is detected on Channel B2 during loop back. 1. Replace the endpoint and repeat test. 2. If test continues to fail, check the wiring between the endpoint and the switch and repeat the test. 3. If test continues to fail, escalate the problem.
	PASS	The endpoint has responded to the switch activate and deactivate loop back application messages. Data has been detected on the looped back channels.
1000	ABORT	Could not seize the endpoint or B-channels for test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

BRI XID Test (#628)

This test checks the D-channel connection between the SPE and the endpoint or adjunct.

In this test, a D-channel XID frame is sent to the endpoint or adjunct over the point-to-point signaling link. The test passes if the endpoint or adjunct responds with a Layer 2 XID-RESPONSE frame.

This test must be administered to not run in the station administration form for ports on a TN2208.

Table 11-49. TEST #628 BRI XID

Error Code	Test Result	Description/ Recommendation
1000	ABORT	The BRI-SET, ASAI-ADJ, ATT-ADJ, LGATE-AJ, ATTE-AJ is busy. The test cannot be executed at this time: 1. Pause momentarily (30 seconds) and re-execute at this time. 2. If this problem persists, escalate this problem. **NOTE:** A BRI-PORT can also be busy. When using this for BRI-PORT/ABRI-PORT tests, the words "BRI-SET, ASAI-ADJ, ATT-ADJ, " can be changed to "BRI-PORT, ABRI-PORT, ATT-ADJ."
1005	ABORT	The endpoint is not administered to support XID Testing. 1. If the endpoint documentation reflects support XID testing, use the **change station extension** command to change the XID Testing? field on the form to "yes."

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Table 11-49. TEST #628 BRI XID — *Continued*

Error Code	Test Result	Description/ Recommendation
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Use the **test port PCSSpp l** command to clear any errors which prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status Test (#626) which is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. 3. If the XID test continues to abort, escalate the problem.
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. 1. Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. 2. If Step 1 does not resolve the problem, escalate to the next tier.
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus in the PPN. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-49. TEST #628 BRI XID — *Continued*

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description/ Recommendation</th></tr>
<tr><td>1187</td><td>ABORT</td><td>The circuit pack, port or station may have been busied out by a technician.
1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET.
2. If this error type is present for BRI-SET only, then release the station via the release station command.
a. If this error type is present for BRI-PORT and BRI-SET, then release the port via release port PCSSpp command and run the test again.
b. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the release port PCSSpp command and run the test again. If the error is present for BRI-SET only, then release the circuit pack via the release port PCSSpp command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the release board PPCSS command and run the test again.
NOTE:
When you release the circuit pack, you release all ports associated with it. If certain ports still need to be busied out, use the release port PCSSpp command to busy them out.
3. Make sure the terminal is connected.
4. Retry the command at one-minute intervals a maximum of five times.
5. If the test continues to abort, escalate the problem.</td></tr>
</table>

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Table 11-49. TEST #628 BRI XID — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	FAIL	The XID-RESPONSE message was not received from the endpoint. 1. Consult the endpoint documentation to determine if the Layer 2 XID and XID-RESPONSE messages are supported. If the documentation reflects no support for these messages, change XID Testing? field to "no" using the **change station extension** command. 2. If the endpoint supports these Layer 2 messages and the test continues to fail, assume the endpoint is defective and replace it. 3. If the test continues to fail, escalate the problem.
	PASS	The switch can successfully pass messages over the D-channel to the BRI endpoint.

BRI Layer 3 Query Test (#629)

This test is used to check the application layer communications between the switch and the endpoint or adjunct.

For BRI endpoints, an application message containing the appropriate endpoint service state is sent by the switch to the endpoint. The endpoint responds with an acknowledgment to the application message.

For ASAI and AT&T adjuncts, this test is not executed from the administration terminal. Rather, a query message is automatically sent by the switch every two minutes. Failure of the switch to receive a response to a query from the adjunct is logged in the Hardware Error Log.

Table 11-50. TEST #629 BRI Layer 3 Query

Error Code	Test Result	Description/ Recommendation
1005	ABORT	The endpoint's MIMs Supported? field is administered to "no." 1. Use the **change station extension** command to change the parameter only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.
1113	ABORT	The signaling link between the switch and the endpoint or adjunct is down. 1. Use the **test port PCSSpp long** command to clear any errors which prevent establishment of the signaling link. 2. Examine the results of Test #626, which is executed with the command. If this test aborts or fails, follow the repair procedure for the Signaling Link Status Test. 3. Escalate problem if BRI Layer 3 Query Test continues to abort.
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-50. TEST #629 BRI Layer 3 Query — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The PKT-CTRL is out-of-service. 1. Consult the repair procedure for PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. 2. If Step 1 does not resolve the problem, escalate to the next tier.
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus in the PPN. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-50. TEST #629 BRI Layer 3 Query — *Continued*

Error Code	Test Result	Description/ Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. 2. If this error type is present for BRI-SET only, then release the station via the **release station** command. a. If this error type is present for BRI-PORT and BRI-SET, then release the port via the **release port PCSSpp** command and run the test again. b. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the **release port PCSSpp** command and run the test again. If the error is present for BRI-SET only, then release the circuit pack via the **release port PPCSS** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the **release board PPCSS** command and run the test again. **NOTE:** When you release the circuit pack, you release all ports associated with it. If certain ports still need to be busied out, use the **release port PCSSpp** command to busy them out. 3. Make sure the terminal is connected. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.
2012	ABORT	Internal System Error.

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Table 11-50. TEST #629 BRI Layer 3 Query — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2068	ABORT	The endpoint has rejected the switch sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Endpoint Service Messages. 1. Use the **change station extension** command and change the MIMs Supported? field to "no."
2069	ABORT	The endpoint has returned an error response to the switch sent application message. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	FAIL	No response is received from the endpoint or the adjunct. For BRI endpoints: 1. Consult the endpoint documentation to determine if ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use the **change station extension** command to change the "MIMs Supported?" field to "no." Use the **busyout station extension** and **release station extension** commands to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. 2. If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.
	PASS	The endpoint has successfully responded to the switch's application message.

BRI Set Audits Test (#630)

This is a series of two tests which are classified as audits. The switch sends messages to the BRI endpoint to perform the following tests:

- Ringer Audit - This audit ensures that both the switch and the endpoint agree as to the current state of the endpoint's ringer.
- Lamps Audit - This audit ensures that both the switch and the endpoint agree as to the current state of the endpoint's lamps.
- Call Activity Audit - This audit ensures that the state of calls is consistent between the switch and the endpoint.

This test is not executed for ASAI or AT&T adjunct because adjuncts do not employ ringers or lamps, or establish calls on the B-channels associated with the BRI interface.

Table 11-51. TEST #630 BRI Set Audits

Error Code	Test Result	Description/ Recommendation
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Use the **test port PCSSpp long** command to clear any errors which prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status Test (#626) which is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. 3. If the BRI Set Audits test continues to abort, escalate the problem.
1139	ABORT	The Packet Bus in the port network is out-of-service. 1. Follow the repair procedures for the Packet Bus. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-51. TEST #630 BRI Set Audits — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The PKT-CTRL is out-of-service. 1. Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. 2. If Step 1 does not resolve the problem, escalate to the next tier.
1144	ABORT	The PPN Packet Bus is out-of-service. 1. Follow the repair procedures for the Packet Bus in the PPN. 2. After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 11-51. TEST #630 BRI Set Audits — *Continued*

Error Code	Test Result	Description/ Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. 2. If this error type is present for BRI-SET only, then release the station via the **release station** command. a. If this error type is present for BRI-PORT and BRI-SET, then release the port via the **release port PCSSpp** command and run the test again. b. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the **release port PCSSpp** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the **release board PPCSS** command and run the test again. **NOTE:** When you release the circuit pack, you release all ports associated with it. If certain ports still need to be busied out, use the **release port PCSSpp** command to busy them out. 3. Make sure the terminal is connected. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.
2012	ABORT	Internal System Error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

SPID Facility Test

This test is used to verify the wiring and operation of the signaling link between the switch and a endpoint or adjunct on a BRI interface. **This test is not executed from the administration terminal, but rather is executed by using a BRI test set equipped with a display.** The test set may replace the BRI set, ASAI or AT&T adjunct under test by plugging it into the same jack or by bridging it onto the wiring at some point between the switch and the endpoint (or adjunct), thereby creating a pseudo-BRI multipoint configuration.

When plugged into the port in this manner, the test set establishes a signaling link connection with the switch and attempts to complete SPID initialization by using the Service SPID administered for the system (see the System Maintenance Administration Form). If the test set displays the correct administered port address for the endpoint or adjunct under test, the test passes (see Service SPID Display which follows). If after one-minute nothing is displayed on the test set, the test fails.

SPID Facility Test

Test Result	Description / Recommendation
FAIL	No response is received from the endpoint. 1. Check the physical wiring between the switch and the endpoint or adjunct. 2. If test continues to fail, escalate to the next tier.
FAIL	Display does not match administered port address for the endpoint or adjunct. 1. Change station administration for endpoint or adjunct to match displayed port address. 2. If test continues to fail, escalate the problem.
PASS	Display matches administered port address for the endpoint or adjunct. For BRI endpoints: 1. Verify that the SPID values administered in the switch and the endpoint are consistent. 2. If the SPID values are correct, replace the endpoint. 3. If test continues to fail, escalate the problem. For ASAI adjuncts: 1. Verify that the TEI values administered in the switch and the adjunct are consistent. 2. If the TEI values are correct, consult the recommended repair procedures of the manufacturer for the adjunct. 3. If test continues to fail, escalate the problem.

The abbreviations used in (Service SPID Display) have the following meanings:

P	port network (1,2, ...)
C	Carrier (A,B,C, ...)
SS	Slot (01, 02, ...)
pp	port (01-12)
ext	extension one and two (one through 99999)
SPID	service order profile identifier

Restricted Service
starting display column

1		8		14		25		31
PCSSpp	-	ext1	-	SPID111111	-	ext2	-	SPID222222

Bound to First Endpoint Translation
starting display column

1		8		14		25		31
PCSSpp	*	ext1	*	SPID111111	-	ext2	-	SPID222222

Bound to Second Endpoint Translation
starting display column

1		8		14		25		31
PCSSpp	-	ext1	-	SPID111111	*	ext2	*	SPID222222

CABINET (Cabinet Sensors)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CABINET	MAJOR	test environment P	Cabinet Sensors
CABINET	MINOR[2]	test environment P	Cabinet Sensors

1 Where P is an appropriate port network number determined via the Port field from the Alarm or Error Log.

2 If a minor alarm occurs for a variable speed fan, the fan should be checked for a dirty filter. If the filter is not dirty, the fan should be replaced.

NOTE:
CABINET is valid only in a multicarrier cabinet system. For information concerning single-carrier cabinet systems, refer to the DC-POWER (Single-Carrier Cabinet Power) Maintenance documentation.

Each multicarrier cabinet is equipped either with six non-variable speed fans or with six variable speed fans.

Non-Variable Speed (Standard) Fan Option. A non-variable speed (standard) fan is indicated by one of the following Product Codes: "ED67077 G1," "ED67077 G2," or "ED67077 G3." Multicarrier cabinets with non-variable speed fans contain a fan speed control unit known as the AHD1 circuit pack. This circuit pack is designed to keep the temperature within the cabinet below 65^0 C (149^0 F). Air is drawn in by the three fans located in the front of the cabinet. The air is channeled upwards through a filter, then through carriers A, B, and C and out the top of the cabinet. Air is drawn in by the three fans located in the back of the cabinet as well. The air is channeled down through a filter, then through carriers D and E and out the bottom of the cabinet. The AHD1 circuit pack monitors five of the six temperature sensors located throughout the multicarrier cabinet, and it uses the output of these sensors to adjust fan speed and to report air flow problems. The Maintenance/Tape Processor in a Standard system PPN, the Duplication Interface circuit pack, a PPN for a High or Critical Reliability system, and the EPN Maintenance circuit pack in an EPN multicarrier cabinet system directly monitor the sixth sensor (S1) to report temperature problems. The Cabinet Sensors maintenance object represents the air flow and temperature problems reported by the AHD1 circuit pack and by the Maintenance/Tape Processor, the Duplication Interface circuit pack, or the EPN Maintenance circuit pack in the multicarrier cabinet systems.

The fans and the AHD1 circuit pack obtain their power from the -48 volt DC power supply of the 631 DB DC power unit in the A carrier. In a PPN cabinet for a High or Critical Reliability system, the 631 DB DC power unit in the B carrier can also provide power to the fans. The power goes from the power unit(s) to the current limiter card (982LS), over a wiring harness from the A carrier to the back of the fan unit, through the AHD1 circuit pack, and then to the fans. The front fans are wired in parallel with a rear fan. The repair scenarios that follow rely on the technician's ability to distinguish between high fan speed and low fan speed. The only way to distinguish between the fan speeds is by the sound of the fans. When operating at high speed, the fans make a higher pitched sound than when they run at low speed. The technician probably knows from prior experience what the fans sound like at low speed as well as at high speed.

Figure 11-12 shows a multicarrier cabinet system and the location of the temperature sensors S1 through S4 (there are actually two S3 sensors and two S4 sensors) as well as the location of the fans, the AHD1 circuit pack, and the filters. The figure also shows other environment-related components of a multicarrier cabinet system and can be ignored for this section on Cabinet Sensors.

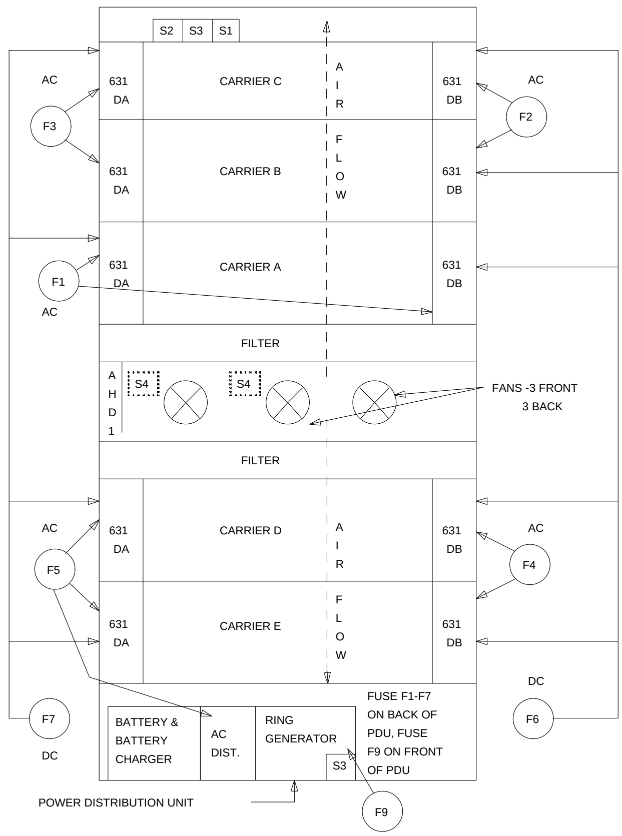

Figure 11-12. Multicarrier Cabinet Environment Components (CABINET) [Non-Variable Speed Fan Option]

Sensor S1 informs the Maintenance/Tape Processor, the Duplication Interface circuit pack, or the EPN Maintenance circuit pack when the temperature at the top of the cabinet reaches 65^0 C (149^0 F). Sensor S2 is not monitored by any circuit pack. However, when the temperature at the top of the cabinet reaches 70^0 C (158^0 F), this sensor causes the Power Distribution Unit to shut down power to the entire cabinet. At this point, Emergency Transfer is invoked, and no other system functions are provided.

The S3 and S4 sensors constantly report the temperature at the air exhaust in the cabinet (top and bottom S3 sensors) and at the air intake (S4 sensors). The AHD1 circuit pack uses this information to determine fan speed and air flow alarm state. If there is at least a 15 ^{0}C (27 ^{0}F) air temperature difference between the air exhaust and air intake, **and** if the air exhaust temperature is greater than 50 ^{0}C (122 ^{0}F), all the fans are turned up to high speed. If this condition exists, the AHD1 circuit pack reports an air flow problem which results in a Minor alarm against the Cabinet Sensors.

Variable Speed Fan Option. A variable speed fan is indicated by the Product Code "ED67077 G‘x,'" where ‘x’ is ‘4’ or a number greater than ‘4.’ A variable speed fan contains Thermal Speed Control and an alarm circuit. As a result, the AHD1 circuit pack is not required in this type of fan.

A variable speed fan has two connectors: a two pin connector for the -48 volt input power for backward compatibility, and the five pin Molex connector for speed control and alarm circuitry. The -48 volt power circuitry is isolated from the speed control and the alarm circuitry.

An alarm lead from all six variable speed fans is tied to a single lead leading to the processor circuit pack. Three fans on the front of the system are connected to an S3 sensor, which monitors the exhaust air temperature above carrier position "C." Three fans on the back of the system are connected to another S3 sensor, which monitors the exhaust air in the power distribution unit. The speed of the variable speed fans is determined by the temperature detected by the S3 sensors. Thus, the fans’ speed changes continuously according to the temperature of the exhaust air. If the fan speed drops below the preset limit, or if the fan fails, the fan alarm circuit reports an air flow problem, which results in a minor alarm.

A multicarrier cabinet containing variable speed fans is presented in Figure 11-13. Note that the two S4 sensors that are included with non-variable speed fans are not required with variable speed fans.

NOTE:
The new variable speed fans are backward compatible to the carriers for the non-variable speed fans. However, the carriers for the variable speed fans are not backward compatible to cabinets configured for the carriers for the non-variable speed fans. Finally, the carriers for the non-variable speed fans are not forward compatible to cabinets configured for the carriers for variable speed fans.

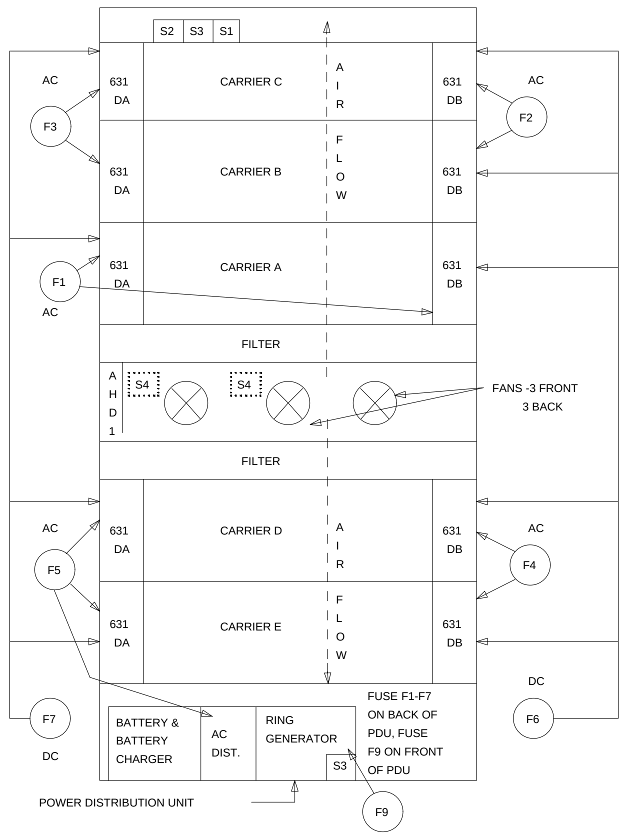

Figure 11-13. Multicarrier Cabinet Environment Components (CABINET) [Variable Speed Fan Option]

Replacement Procedures for AHD1 Fan Speed Controller Circuit Packs and Fans

AHD1 Fan Speed Controller Circuit Pack Replacement Procedure

NOTE:
The procedures in this section pertain only to non-variable speed (standard) fans.

1. Refer to Chapter 5, "Routine Maintenance Procedures", for details on removing power from the system.
2. Remove the fan assembly cover by pulling the cover outward.
3. Loosen and remove the retaining screw nearest the power plug on the front fan located to the extreme left.
4. Disconnect the power plug from the fan.
5. Loosen and remove the other retaining screw on the fan.
6. Remove the fan from the fan assembly.

CAUTION:
DO NOT TOUCH! Resistors on the circuit pack are hot.

7. Lift the latch on the AHD1 fan speed controller circuit pack.
8. Using the latch as a handle, pull the circuit pack up and out of its holder.
9. Insert a replacement AHD1 circuit pack, and push down on the latch until the latch snaps in place.
10. Position the fan, and reconnect the fan power plug.
11. Insert and tighten the retaining screws.
12. Replace the fan assembly cover.
13. Refer to Chapter 5, "Routine Maintenance Procedures", for details on restoring power to the switch.

Fan Replacement Procedure

NOTE:
The procedures in this section pertain to both non-variable speed (standard) fans and variable speed fans.

First, determine which fans are defective:

NOTE:
The following instructions are for servicing a Medium Cabinet. For a Small Cabinet (only two fans in the rear), follow Step 2A below, but start from the rear of the cabinet.

1. If any fan is **not** rotating, a more detailed inspection is required to determine why the fan has stopped operating. The fact that a fan is not spinning is not always proof that it is damaged. Since each front fan is electrically in parallel with a rear fan, an internal short circuit in a front fan prevents power from reaching the rear fan (and vice versa).

   Remove the fan assembly cover by pulling the cover outward. Remove the power connector from each inoperative front fan.

2. The following must be done to determine if the front fan or the rear fan has failed:

   a. Test the front fan:

      Measure the input impedance between the (+) and (-) input terminals of the front fan with an ohmmeter. **IMPORTANT: Attach the "common" lead of the ohmmeter to the fan's (-) input terminal and the "ohms" or "+" lead of the ohmmeter to the fan's (+) input terminal.**

      Follow the guidelines in the table below:

Input Impedance	Fan Analysis	Action	Next Step
2.0M < ohms < 20M	Good	None	Go to Step 2B
ohms < 2.0M	Short Circuit	Replace	Go to Step 3
ohms > 20M	Open Circuit	Replace	Go to Step 3

   b. Test the "paired" rear fan:

      From the front of the cabinet, use a voltmeter to measure the DC voltage across the two female contact pins in the connector housing of the fan wire harness removed from the inoperative front fan in Step 1. (This voltage is the same voltage seen across the input terminals of the paired fan in the rear of the assembly.)

      Follow the guidelines in the table below:

Input Impedance	Fan Analysis	Action	Next Step
VDC > 25V	Good	(AHD1 or Front Fan failed)	
VDC < 25V	Short Circuit	Replace	Go to Step 3

3. To replace a fan located at the front of the switch cabinet, remove the fan assembly cover by pulling the cover outward. To replace a fan located at the rear of the switch cabinet, use a No. 10 slot screwdriver or 5/16-inch (8mm) wrench and remove the panel covering the fan assembly.
4. Loosen and remove the retaining screw nearest the power plug on the defective fan.

DANGER:
48-volt power is present on the fan plug.

5. Disconnect the power plug from the defective fan.
6. Loosen and remove the other retaining screw on the fan.
7. Remove the fan from the fan assembly.
8. Position the replacement fan and reconnect the fan power plug.
9. Insert and tighten the retaining screws.
10. Replace the fan assembly cover or panel.

Hardware Error Log Entries and Test to Clear Values

Cabinet Sensors Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
1	Any	Cabinet Temperature Query Test (#122)	MINOR	ON	test environment P sh r 3
257	Any	Cabinet Temperature Query Test (#122)	MAJOR	ON	test environment P sh r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
Power Unit Query Test (carrier E) (#127) (c)	X	X	ND
Power Unit Query Test (carrier D) (#127) (c)	X	X	ND
Power Unit Query Test (carrier A) (#127) (c)	X	X	ND
Power Unit Query Test (carrier B) (#127) (c)	X	X	ND
Power Unit Query Test (carrier C) (#127) (c)	X	X	ND
Emergency Transfer Query Test (#124) (d)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to POWER (Battery & Battery Charger) Maintenance documentation for a description of this test.

b. Refer to AC-POWER (AC-Power) Maintenance documentation for a description of this test.

c. Refer to CARR-POW (Carrier Port Power Unit for AC- and DC-Powered Systems) Maintenance documentation for a description of this test.

d. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test. This test shows up in the test sequence only if there is a TN768 Tone-Clock circuit pack in the port network being tested.

Cabinet Temperature Query Test [for Non-Variable Speed Fans] (#122)

This test queries the Maintenance/Tape Processor in a Standard system PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN for the status of the cabinet sensors in the cabinet that contains non-variable speed fans.

NOTE:
The descriptions for Error Codes 1 and 2 (FAIL) in the following table are reversed for Generic 1 systems that use a TN731B maintenance circuit pack . That is, Error Code 1 indicates an "over temperature" problem while Error Code 2 indicates and "air flow" problem. If you are servicing a Generic 1 system, be sure to follow the proper service strategy.

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans]

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Then, repeat the test. 3. If the test continues to ABORT with a Error Code 2000, check for and resolve all DUPINT (Duplication Interface) errors in a Duplicated Option PPN, PR-MAINT (Maintenance/Tape Processor) errors in a standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 4. If the test continues to ABORT with a Error Code 2000, escalate the problem.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The AHD1 circuit pack has reported an air flow problem. The temperature difference between the air intake and the air exhaust is at least 15^0 C (27^0 F) **and** the absolute temperature at the top of the cabinet is at least 50^0 C ($122\ ^0$F) (referred to as the 15^0 C/50^0 C criteria). The fans should be running at high speed. 1. If none of the fans are running, then: a. Look for and resolve all alarms against the CARR-POW (Carrier Port Power Unit). b. Verify -48 volt DC power is available to the fan units. Check the fan unit wiring harness connector. Check that there is 48 volt DC between pins 3, 9, 11 and 2, 8, 10. ■ If there is -48 volt DC power at the connector, there should be power to the fans. If the fans are not running, replace the AHD1. If the fans still do not run, escalate the problem. ■ If there is no -48 volt DC power at the connector, then the current limiter card (982LS) is probably defective. Replace the current limiter card. If the fans still do not run, escalate the problem. 2. If only a few of the fans are not running, replace the defective fans. 3. If all the fans can be started, wait five minutes and rerun the test. If the test fails again, proceed to Step 4 or 5 as applicable.

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL *(cont'd.)*	4. If the fans are not at high speed, measure the cabinet temperature at the air intake and the air exhaust at the top of the cabinet. a. If the 15^0 C/50^0 C criteria is met, there is a problem with either the AHD1 circuit pack or the fans that is preventing the fans from operating at high speed. Replace the AHD1 circuit pack and/or the fans. If this succeeds in getting the fans to run at high speed, wait five minutes to give the cabinet time to cool down and, rerun the test. If the problem persists, go to step 5. b. If the 15^0 C/50^0 C criteria is not met, the PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack is incorrectly reporting this condition. Look for and resolve all errors on these maintenance objects first, then rerun the test. If the test still fails, escalate the problem. 5. If the fans are running at the high speed, check the items on list that follows. Any on of the items could be restricting or redirecting the flow of air within the cabinet. a. Check both filters. If a filter is dirty or clogged it should be cleaned or replaced. The filters can either be washed with soap and water or vacuumed. b. Make sure there is nothing (other than circuit packs) in the carrier slots that could be restricting the air flow. c. Make sure there are no missing (blank) circuit pack or carrier faceplates. Install and/or replace them as necessary. d. Make sure the cabinet door is properly closed. The door must be closed for the fans to be able to properly cool the cabinet. Wait five minutes to give the fans a chance to cool the cabinet. Rerun the test. If the tests still fails, proceed to Step 6.

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL *(cont'd.)*	6. At this point, there should be nothing impeding the air flow, and the fans should be running at high speed. Check the temperatures for the 15^0 C/50^0 C criteria. a. If the 15^0 C/50^0 C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait five minutes and rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled. b. If the 15^0 C/50^0 C criteria does not exist, the AHD1 circuit pack, the fans, or the S3 or S4 sensors are defective. Replace these items one at a time (in the order listed). Rerun the test between each replacement. Failures can occur on the Maintenance/Tape Processor, the Duplication Interface, and the EPN Maintenance circuit pack that **are not** detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If this does not clear the problem, follow normal escalation procedures.

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack has reported a temperature problem because the S1 sensor has detected a temperature of at least 65^0 C (149^0 F). The entire cabinet is in danger of being powered down if the temperature reaches 70 ^{0}C (158^0 F). 1. If none of the fans are running: a. Look for and resolve all alarms against the CARR-POW (Carrier Port Power Unit). b. Verify that 48 volt DC is available to the fan units. Check the fan unit wiring harness connector. Verify that there is 48 volt DC between pins (3, 9, 11 and 2, 8, 10). ■ If there is 48 volt DC at the connector, there should be power to the fans. If the fans are not running, replace the AHD1. If the fans still do not run, follow normal escalation procedures. ■ If there is not 48 volt DC at the connector, the current limiter card (982LS) is probably defective. Replace the current limiter card. If the fans still do not run, escalate the problem. 2. If only a few of the fans are not running, replace the defective fans. 3. If all the fans can be started, wait five minutes, and rerun the test.If the test fails again, proceed to Step

Continued on next page

Table 11-52. TEST #122 Cabinet Temperature Query Test [Non-Variable Speed Fans] — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL *(cont'd.)*	4. Check the temperature at the top of the cabinet. If the temperature is at least 65^0 C (149^0 F), the ambient room temperature is too high, and the fans cannot cool the system. Unless the room temperature is reduced, the system is going to shut down soon. If the temperature is less than 65^0 C, then: a. The PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack may be incorrectly reporting this condition. First, look for and resolve all errors on these MOs, then rerun the test. If this test fails again, return to Step 1. If there are no errors, continue. b. The sensor S1 may be incorrectly reporting the temperature at the top of the cabinet. Replace sensor S1, and rerun the test. If the test still fails, escalate the problem.
3	FAIL	The AHD1 circuit pack has reported both air flow and temperature problems. Resolve the airflow error first, then, correct the temperature error as described previously.
	PASS	The AHD1 circuit pack has not reported any temperature or air flow problems. The temperatures at the air exhaust at the top of the cabinet and the air intake at the bottom of the cabinet can be measured and the results compared against the criteria described previously. If a problem has been reported, troubleshoot this problem by using the procedures for the "FAIL" cases described previously.

CAP-MEM (Memory Card Capacity) [386 Systems]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
CAP-MEM	MINOR/ WARNING[1]	test card-mem long	Memory Card Capacity

1 The WARNING alarm is generated when the alarm is downgraded by using the **set option** command.

Memory Card Capacity tracks the percentage of used translation storage space on the memory card. Whenever translation space usage on the memory card reaches 98% of capacity, an alarm is generated. This alarm serves to inform the user that a larger flash card may be required for the system.

Hardware Error Log Entries and Test to Clear Values

Memory Card Capacity Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	112	Memory Card Capacity Test (#1014)	MINOR/ WARNING (b)	OFF	test card-mem long

Notes:

a. The memory card translation storage space is at least or more than 98% full.

b. This alarm has been downgraded by the **set option** command.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table that follows when you are inspecting errors in the system. By clearing error codes associated with the "Memory Card Capacity Test," for example, you may also clear errors generated from other tests in the testing sequence. The "Memory Card Capacity Test" can be initiated via either the **test card-mem long** command or after a **save translation** command.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
12 Volt Power Supply Test (#701) (a)	X	X	ND
Memory Card Insertion Test (#695) (b)	X	X	ND
Memory Card Format and Read Test (#696) (b)	X	X	ND
Memory Card Match Test (#697) (b)	X	X	ND
Memory Card Write-Protected Test (#698) (b)	X	X	ND
Memory Card Directory Recovery Test (#699) (b)	X	X	ND
Memory Card Translation Data Integrity Test (#694) (b)		X	ND
Memory Card Erase/Write/Read Test (#693) (b)		X	ND
Memory Card Capacity Test (#1014)		X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to 12V-PWR (12 Volt Power Supply) Maintenance documentation for a description of this test.

b. Refer to CARD-MEM (Memory Card) Maintenance documentation for a description of this test.

Memory Card Capacity Test (#1014)

This test is a nondestructive test. The purpose of the test is to verify that the percentage of translation storage space used in the memory card is less than 98%.

This test can be initiated through a system technician demanded **test card-mem long** command, or it can be executed as part of a maintenance test sequence after the **save translation** operation.

Table 11-53. TEST #1014 Memory Card Capacity Test

Error Code	Test Result	Description/ Recommendation
112	ABORT	The Memory Card Translation storage is at least 98% full. 1. Inform the user that it may be necessary to upgrade to a larger flash card. 2. Replace the memory card with a larger one, or downgrade the alarm to WARNING by using the **set option** command. 3. Rerun the test.
2012 2106 2114	ABORT	Internal System Error 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for repairing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem long** command.

Continued on next page

Table 11-53. TEST #1014 Memory Card Capacity Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2110	ABORT	No Memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Rerun the test.
	PASS	The Memory Card Translation storage is less than 98% full.

CARD-MEM (Memory Card)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
CARD-MEM	MAJOR[1]		Memory Card
CARD-MEM	MINOR	test card-mem long	Memory Card
CARD-MEM	WARNING	test card-mem sh	Memory Card

1 The "MAJOR" alarm occurs only at power-up time or on a Reset System 3, 4, or 5 when the switch cannot load all translations from the memory card.

A memory card contains a set of flash EPROM memory devices. The data can be stored in a memory card and can remain nonvolatile, even when the power is off. In a 386 system, the memory card is installed into the TN777B NETCON circuit pack to save the translations, announcements, and core dumps. During the system reboot or a system power down condition, the in-core system maintenance hardware error logs are temporarily saved in the memory card before the system goes down. When the system is restarted, the error logs file is read back from the memory card.

The Hard Patch feature also uses the memory card as temporary storage when LMM applies an update file to the in-core system software. The system software is stored in the "flash" section of main memory. The memory card used for saving translations doesn't contain a copy of the system software.

The recommended size of a memory card for each configuration is described in the following table.

Memory Card Size	Usage	File Names
1 Megabyte	Without Announcements	translation
4 Megabyte	With Announcements	translation announcements
10 Megabyte	With Announcements	translation announcements
10 Megabyte	Maintenance	translation announcements core_ dump
10 Megabyte	System Upgrade	system_software

Customers can have either 1 MB, 4 MB, or 10 MB memory cards for the normal operations. 10 MB memory cards are also used for maintenance and software upgrades. The software upgrade memory card cannot be used for saving translations.

Always use 4 MB memory Cards, 10 MB memory cards should only be used when a 4MB card gives an error in the CAP-MEM Maintenance Object Test #1014 (Memory Card Capacity Test).

A memory card has a write-protection switch along its edge. If the write-protection switch is enabled, the memory card cannot be written to.

The 12 volt power supply unit located in TN777B NETCON circuit pack supports the erase and write operations of flash memory devices in the TN786B or TN790 Processor circuit pack. The unit also supports the memory card inserted in the TN777B NETCON circuit pack. If the 12 volt power supply unit cannot be turned on to supply 12 volts, all erase and write operations fail. Refer to 12V-PWR (12 volt power supply) Maintenance documentation for a detailed description.

To write data (for example, translations) onto a memory card, the system software first erases the memory card and then writes the data. An erased bit can be written again, but a written bit cannot be changed or written again until after the next erasure. Software erase and write operations on a memory card take longer as the card usage increases. A memory card that cannot be erased or written to by software should be replaced.

Removing A Memory Card From The Slot

A memory card can be removed from the slot at the TN777B NETCON circuit pack only when the fourth yellow LED with a label "card-in-use" is not glowing. Otherwise, the memory card operation might be interrupted abnormally, and the files stored in the memory card may become corrupted.

Resolving an Alarm Raised Against a Memory Card

The list that follows discusses the procedures for resolving an alarm that is raised against a memory card:

1. Remove the inserted memory card from the slot at the TN777B NETCON circuit pack while the "card-in-use" amber LED on TN777B is not glowing.
2. Insert the new formatted memory card firmly into the slot at the TN777B NETCON circuit pack.
3. Enter the **test card-mem** command to verify the new memory card.
4. If the alarm cannot be resolved by replacing the memory card, do the following:
    a. Remove the memory card from the TN777B NETCON circuit pack.

   b. Replace the TN777B NETCON circuit pack in the appropriate control carrier. Since the TN777B is in the SPE control complex, follow the standard procedures for replacing an SPE circuit pack.
   c. Insert the memory card back into the slot at the TN777B circuit pack.
   d. Enter the **test network-control [long]** command to verify the new TN777B and the memory card.
5. Once the alarm is resolved, enter the **save translation** command to store the current system translations to the memory card.
6. If applicable, enter the **save announcements** command to store the current announcements to the memory card.

Hardware Error Log Entries and Test to Clear Values

Memory Card Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test card-mem
1(a)		Memory Card Insertion Test (#695)	MINOR	OFF	test card-mem
257(b)		Memory Card Format and Read Test (#696)	MINOR	OFF	test card-mem
513(c)	Any	Memory Card Match and Read Test (#697)	WARNING	OFF	test card-mem
769(d)		Memory Card Write-Protected Test (#698)	WARNING	OFF	test card-mem
1025(e)	104 105 106 107 108	Memory Card Dir. Recovery Test (#699)	MINOR	OFF	test card-mem
1281(f)	Any	Memory Card Translation Data Integrity Test (#694)	MINOR	OFF	test card-mem long
1537(g)	104 105 106 107 108	Memory Card Erase/Write/Read Test (#693)	MINOR	OFF	test card-mem long
3329(h)	any	None	MINOR/ MAJOR	OFF	
3841(i)	Any	Save Translation	MINOR	OFF	save translation
3843(j)	Any	Save Translation	MINOR	OFF	save translation

1 Run the Short Test sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. System detects that no memory card is inserted in the slot at the TN777B NETCON circuit pack. If a memory card is in place, the memory card may have a bad physical connection.

b. System software cannot recognize the inserted memory card because the inserted memory card is not formatted or the directories in the memory card are corrupted. The system cannot use this memory card. The memory card must be replaced with a good memory card.

c. The inserted memory card does not have enough storage space to support system operations, such as saving translations and, if applicable, announcements; or, the memory card is a system-upgrade memory card that cannot be used for saving translations. This hardware error raises a WARNING/OFF_BOARD alarm. The memory card should be replaced with one of the recommended size.

   The "Aux Data" field contains the following error codes:

   - 101: Inserted memory card is a system-upgrade memory card
   - 102: While the announcement feature is in use, no announcement file is available in the memory card
   - 103: The inserted memory card is a system-upgrade memory card, and, while the announcement feature is in use, no announcement file is available in the memory card.
   - 116: The capacity of the inserted memory card doesn’t match the system configuration.
   - 118: While the announcement feature is in use, no announcement file is available in the memory card, and the capacity of the inserted memory card doesn’t match the system configuration.
   - 132: System translation reaches a 98% capacity of the memory card reserved storage space.
   - 134: While the announcement feature is in use, no announcement file is available in the memory card, and system translation reaches a 98% capacity of the memory card reserved storage space.
   - 148: The capacity of the inserted memory card doesn’t match the system configuration, and system translation reaches a 98% capacity of the memory card reserved storage space.
   - 150: While the announcement feature is in use, no announcement file is available in the memory card, and the capacity of the inserted memory card doesn’t match the system configuration. Also, the system translation reaches a 98% capacity of the memory card reserved storage space.

d. The write-protection switch of the memory card is in the "protected" position. A write-protected memory card can not be erased or written. Before entering the **test** command to resolve the alarm, follow the standard procedure for taking the memory card out of the slot. Then, change the "write-protection" switch to the "not-protected" position. Finally, insert the memory card back into the slot.

e. The memory card has been detected with a broken directory. A MINOR/OFF_BOARD alarm is raised when maintenance cannot restore the broken directory. The memory card must be replaced before the test to resolve the alarm is run.

   The "Aux Data" field contains the following error codes:

   - 104: Directories on the memory card are corrupted and cannot be recovered.
   - 105: "0" cannot be written into the memory card before an erase operation.
   - 106: Memory card cannot be erased.
   - 107: Data cannot be written into a memory card after an erasure.
   - 108: 12 volt power supply for directory recovery can't be turned on. The 12 volt power supply on TN777B NETCON circuit pack may be defective. Follow the standard procedure to replace the TN777B NETCON circuit pack.

f. The translations file stored in the memory card is corrupted with a checksum error during the read operation. The memory card can no longer hold the written data. Enter the **save translation** command to restore the translations. Then, run the **test** command to clear the alarm. If the error occurs repeatedly, replace the memory card.

g. The maintenance test "Memory Card Erase/Write/Read Test" failed. Enter the **status card-mem** command to verify that a user's memory card is inserted and that the write-protection switch of the memory card is off. Rerun the **test card-mem** command to verify that the 12 volt power supply is functional.

   Enter the **test card-mem long** command again to verify the test result of the "Memory Card Erase/Write/Read Test." If the test still fails, the memory card should be replaced. After the new memory card is inserted, enter the **test card-mem long** command again to resolve the alarm.

   The "Aux Data" field contains the same error codes as for Error Type "1025." See Note (e).

h. There was an error while translations were being loaded. The relevant alarm occurs at power-up or on a Reset System 3, 4, or 5 if the switch cannot load translations.

   In a standard system, the alarm invokes Emergency Transfer. The repair procedure for a standard system is provided in the list that follows:

NOTE:
Follow this procedure **only** if there are no other memory card errors or alarms. If such errors or alarms exist, resolve them before trying to resolve this alarm.

1. After you resolve all other memory card problems, issue the **reset system 3** command.
2. After the system is restarted, issue the **status card-mem** command.
3. If the "translation" is not present, insert a backup memory card and then issue the **reset system 3** command.
4. If the problem is *not* resolved, follow normal escalation procedures.

NOTE:
In a High or Critical Reliability System where the problem is in the Standby SPE, use the procedure above substituting **reset spe-standby 3** and **status card-mem a/b** for the Standby SPE.

i. The "save translation" operation failed. The reasons for failure are described in the "Aux Data" field and include the following:

1	Directory file on the memory card failed the checksum test
2	NETCON is not a TN777B circuit pack
3	Too many commands are running
4	Command has been aborted
5	Command has collided with a current command
6	Software controller is idle
7	Memory card has been erased
8	Only one good directory is on the card
9	All directories are corrupted, and the memory card needs reformatting
10	Hard patch file is full
11	Hardware fault: data can't be written into the memory card
12	Software error: passed parameters were out of range
13	Command has been aborted
14	Magic number is illegal
15	Driver was trapped when reading the memory card
16	No memory card is inserted

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17	Second directory in the memory card couldn't be found
18	File in the memory card is not available
19	Memory card does not match the system usage
20	Memory card is too small for the system usage
21	Broken directory couldn't be recovered
22	System upgrade card is inserted
23	Illegal write is requested
24	Generic software failure
25	Driver timed out
26	Driver is unable to program "O's" in the memory card
27	Memory card can't be erased
28	Memory card is write-protected
29	12 volt power supply could not be turned on
109	Standby SPE does not respond to the request from the Active SPE
124	Can't access Standby SPE for saving translation

A MINOR/OFF_BOARD alarm is raised when two consecutive "save translation" operations fail. The alarm is resolved only when the translation is saved onto the memory card successfully.

j. The save translations failure is due to other hardware failures. Enter the **test card-mem long** command and resolve other card-mem failures first. After the all test card-mem pass message is received, use the **save translation** command to resolve this error.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *Memory Card Insertion Test* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
12 Volt Power Supply Test (#701) (a)	X	X		ND
Memory Card Insertion Test (#695)	X	X		ND
Memory Card Format and Read Test (#696)	X	X		ND
Memory Card Match Test (#697)	X	X		ND
Memory Card Write-Protected Test (#698)	X	X		ND
Memory Card Directory Recovery Test (#699)	X	X		ND
Memory Card Translation Data Integrity Test (#694)		X		ND
Memory Card Erase/Write/Read Test (#693)		X		ND

1 D = Destructive; ND = Nondestructive

a. Refer to 12V-PWR (12 Volt Power Supply) Maintenance documentation for a description of this test.

Memory Card Erase/Write/Read Test (#693)

The purpose of this test, which is nondestructive, is to verify the erase, write, and read operations. The test erases the backup copy of the translation file stored in the memory card, and it verifies that the erase operation works. The test then writes the primary copy of the translation file from the same memory card to the erased flash segment, and it verifies that the translation file is written successfully.

This test can be initiated through a system technician demanded **test card-mem long** command, or it can be executed as part of a maintenance test sequence when the "save translation" and "save announcements" operations fail. The test and relevant applications (for example, saving translations, saving announcements) cannot be executed at the same time.

Table 11-54. TEST #693 Memory Card Erase/Write/Read Test

Error Code	Test Result	Description/ Recommendation
1192	ABORT	Applications are accessing the memory card. 1. Wait 10 minutes for the applications to complete. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.

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Table 11-54. TEST #693 Memory Card Erase/Write/Read Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2111	ABORT	Inserted memory card cannot be recognized. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2112	ABORT	Internal system error. The inserted memory card is a "system-upgrade" memory card. 1. Replace the inserted memory card with a user's memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2115	ABORT	The memory card is write-protected. 1. Take the memory card out, and change the "write-protection" switch to the "not-protected" position. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-54. TEST #693 Memory Card Erase/Write/Read Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2113	ABORT	The inserted memory card has only one directory file. 1. Enter the **test card-mem** command, and verify that the "Memory Card Directory Recovery Test" (#699) passes. If the directory file cannot be recovered, replace the memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2117	ABORT	No translation file has been saved onto the memory card. 1. Enter the **save translation** command, and verify that the translations are saved onto the memory card successfully. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-54. TEST #693 Memory Card Erase/Write/Read Test — *Continued*

Error Code	Test Result	Description/ Recommendation
104	FAIL	Directories on the memory card are corrupted and cannot be recovered.
105	FAIL	"0" cannot be written into memory before an erase operation.
106	FAIL	Memory card cannot be erased.
107	FAIL	Data cannot be written onto a memory card after an erasure. 1. Replace the memory card and re-run the test. 2. If the test continues to fail, escalate the problem.
108	FAIL	12 volt power supply for the Memory Card Erase/Write/Read Test can't be turned on. The 12 volt power supply on TN777B NETCON circuit pack may be defective. 1. Re-enter the **test card-mem** command, and verify the result of Test 701 for the 12 Volt Power Supply. 2. If Test 701 fails, follow the Standard Repair Procedure to replace the TN777B NETCON circuit pack with a new TN777B circuit pack. 3. Re-enter the command a one minute intervals a maximum of five times. 4. If the test continues to fail, escalate the problem.

Memory Card Translation Data Integrity Test (#694)

This test, which is nondestructive, verifies the integrity of the translation file stored in the memory card by reading (without any PREC updates) the translation file from the memory card and by then performing a checksum error checking. The calculated checksum value is compared with the recorded checksum value in the translation file. If these two values are different, this indicates that the translation file is corrupted.

Table 11-55. TEST #694 Memory Card Translation Data Integrity Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-55. TEST #694 Memory Card Translation Data Integrity Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2111	ABORT	Inserted memory card cannot be recognized. 1. Insert a new formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2112	ABORT	Internal system error. The inserted memory card is a "system-upgrade" memory card. 1. Replace the inserted memory card with a user's memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
Any	FAIL	A checksum error is detected in the translation file that is stored in the inserted memory card. 1. Enter the **save translation** command, and verify that translations can be successfully saved onto the memory card. 2. Rerun the test. 3. If the test fails again, replace the memory card, and repeat Steps 1 and 2. 4. If the test continues to fail after the memory card is replaced, escalate the problem.
	PASS	No checksum error is found in the translation file.

Memory Card Insertion Test (#695)

This test, which is nondestructive, verifies whether a memory card is inserted into the memory card slot at the TN777B NETCON circuit pack and also whether the system can detect its existence.

Table 11-56. TEST #695 Memory Card Insertion Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.

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Table 11-56. TEST #695 Memory Card Insertion Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	No memory card is inserted in the TN777B NETCON circuit pack, or the inserted memory card has a bad connection. 1. Insert a memory card into the slot at the TN777B NETCON circuit pack. 2. If a memory card is already inserted, take the memory card out and examine the connectors of the memory card and the TN777B NETCON circuit pack. Insert the memory card into the slot again. 3. When a memory card is pushed into the slot, make sure that the memory card is inserted firmly into the slot. 4. Re-enter the **test card-mem** command. If the test still fails, replace the memory card, and then repeat this step one more time. 5. If the test still fails after you replace the memory card, replace the TN777B NETCON circuit pack. Follow the Standard Repair Procedures for a memory card. 6. If the problem can not be resolved by replacing both memory card and TN777B NETCON circuit pack, escalate the problem.
	PASS	A memory card is inserted into the TN777B NETCON circuit pack, and the system can recognize its existence.

Memory Card Format and Read Test (#696)

This test is a nondestructive test. The memory card used in a 386 system must be formatted before an application. The test reads the directory file from the memory card, and it verifies the integrity of the directory file.

Table 11-57. TEST #696 Memory Card Format and Read Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2113	ABORT	One of the two directories in the memory card is corrupted. 1. Re-enter the **test card-mem** command, and verify that Test #699 passes. 2. If the test is aborted again with this error code, replace the memory card.

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Table 11-57. TEST #696 Memory Card Format and Read Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	System software cannot recognize the inserted memory card. The memory card is not formatted, or the directories of the memory card are corrupted. 1. Replace the memory card with a new formatted memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
	PASS	System recognizes the inserted memory card, and it can read the directories from the memory card.

Memory Card Match Test (#697)

This test is a nondestructive test. The test verifies the inserted memory card for consistency with the system configuration. The test helps answer the following questions:

- Is the inserted memory card a system software upgrade card?
- Does the size of the inserted memory card match the capacity of the system configuration?
- Does the inserted memory card contain the Announcement file for a system with an Announcement circuit pack?
- Does the size of the translations in the system reach 98% of the reserved storage space on the memory card?

If the answer to any of these questions is "yes," maintenance raises a WARNING alarm for service attention. A new memory card is usually required.

Table 11-58. TEST #697 Memory Card Match Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Rerun the test.

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Table 11-58. TEST #697 Memory Card Match Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2111	ABORT	Inserted memory card is not formatted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Rerun the test.
101	FAIL	The inserted memory card is a system-upgrade memory card. 1. Replace the memory card with a user's memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
102	FAIL	The inserted memory card does not contain an Announcements file, and the system is configured with the Announcement feature. 1. Replace the memory card with a 10 MB memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
103	FAIL	The memory card is a system-upgrade memory card and, while the announcement feature is in use, no announcement file is available in the memory card. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.

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Table 11-58. TEST #697 Memory Card Match Test — *Continued*

Error Code	Test Result	Description/ Recommendation
116	FAIL	The capacity of the inserted memory card doesn't match the system configuration. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
118	FAIL	While the announcement feature is in use, no announcement file is available in the memory card, and the capacity of the inserted memory card doesn't match the system configuration. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
132	FAIL	Translation reaches 98% of the memory card reserved storage space. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
134	FAIL	While the announcement feature is in use, no announcement file is available in the memory card, and system translation reaches a 98% capacity of the memory card reserved storage space. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.

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Table 11-58. TEST #697 Memory Card Match Test — *Continued*

Error Code	Test Result	Description/ Recommendation
148	FAIL	The capacity of the inserted memory card doesn't match the system configuration, and system translation reaches 98% of the memory card reserved storage space. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
150	FAIL	While the announcement feature is in use, no announcement file is available in the memory card, and the capacity of the inserted memory card doesn't match the system configuration. Also, system translation reaches a 98% capacity of the memory card reserved storage space. 1. Replace the memory card with one of a larger size. See the system configuration guidelines. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to fail, escalate the problem.
	PASS	The inserted memory card matches the system configuration, and the card has enough space for saving translations and (if applicable) announcements.

Memory Card Write-Protection Test (#698)

This test, which is nondestructive, verifies whether the write-protected switch on the memory card is turned on. The memory card cannot be erased or written to when the write-protected switch is on.

Table 11-59. TEST #698 Memory Card Write-Protected Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2111	ABORT	Inserted memory card is not formatted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-59. TEST #698 Memory Card Write-Protected Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The "Write-Protection" switch of the inserted memory card is turned on at the "protection" position. 1. Take the inserted memory card out, and move the "write-protection" switch to the "not-protected" position. 2. Insert the memory card back into the slot. 3. Retry the command at one minute intervals a maximum of five times. 4. If the test continues to fail, escalate the problem.
	PASS	The inserted memory card is not write-protected.

Memory Card Directory Recovery Test (#699)

This test is a nondestructive test. All memory cards, except the memory card for system software upgrade, have two copies of both directory files and translation files to ensure that there is at least a good translation file in the memory card at any time, especially during the "save translation" operation.

If one of the two directory files (for example, the directory file) is missing or broken (for example, the directory file has a bad checksum), maintenance can build the directory file.

The Memory Card Directory Recovery Test

- Verifies the integrity of both active and backup directory files in a memory card, and
- Requests a rebuilding of the directory file if the file is missing or corrupted.

When the test passes, both directories are sane.

If the memory card is a system-upgrade memory card, the test is aborted.

If the test fails, the broken or missing directory cannot be rebuilt. As a result, all subsequent "write-to-memory card" operations are blocked. Whenever an alarm is raised and Error Type 1025 for "CARD-MEM" is active, the memory card should be replaced.

Table 11-60. TEST #699 Memory Card Directory Recovery Test

Error Code	Test Result	Description/ Recommendation
1192	ABORT	Contention error. Applications are accessing the memory card. 1. Wait 10 minutes for the applications to complete. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2012 2106 2114	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-60. TEST #699 Memory Card Directory Recovery Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2108	ABORT	The NETCON circuit pack is not a TN777B circuit pack. 1. Follow the Standard Repair Procedures for replacing the NETCON circuit pack with the TN777B circuit pack. 2. Re-enter the **test card-mem** command.
2110	ABORT	No memory card is inserted. 1. Insert a formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2111	ABORT	Inserted memory card cannot be recognized. 1. Insert a new formatted memory card into the slot at the TN777B NETCON circuit pack. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2112	ABORT	Internal system error. The inserted memory card is a "system-upgrade" memory card. 1. Replace the inserted memory card with a user's memory card. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-60. TEST #699 Memory Card Directory Recovery Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2115	ABORT	The memory card is write-protected. 1. Take the memory card out, flip the "write-protection" switch to the "not-protected" position, and insert the memory card back into the slot. 2. Retry the command at one minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
104	FAIL	Directories in the memory card are corrupted and cannot be recovered.
105	FAIL	"0" cannot be written into memory before an erase operation.
106	FAIL	Memory card cannot be erased.
107	FAIL	Data cannot be written into a memory card after the erase operation. Maintenance cannot restore the missing or broken directory file in the inserted memory card. 1. Replace the memory card with a new formatted one. 2. Retry the command at one minute intervals a maximum of five times. If the test continues to fail, escalate the problem.
108	FAIL	12 volt power supply for directory recovery can't be turned on. The 12 volt power supply on TN777B NETCON circuit pack may be defective.
		1. Re-enter the **test card-mem** command, and verify the result of Test 701 for 12 Volt Power Supply. 2. If Test 701 fails, follow the Standard Repair Procedure to replace the TN777B NETCON circuit pack with a new TN777B circuit pack. 3. Retry the command at one minute intervals a maximum of five times. 4. If the test continues to fail, escalate the problem
	PASS	Both directory files in the inserted memory card are sane.

CARR-POW (Carrier Port Power Unit) for AC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CARR-POW	MAJOR	recycle carrier PC	Carrier Port Power Unit

1 Recycle the carrier indicated by the PORT field in the Alarm Log.

DEFINITY Generic 1 offers two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, the aspects of a PPN configuration for a High or Critical Reliability system or of an EPN cabinet configuration are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate MO section(s).

- For a single-carrier cabinet system, refer to the "DC-POWER (Single-Carrier Cabinet Power)" Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for AC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems", or "POWER (Battery & Battery Charger) for AC-Powered Systems".
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for DC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for DC-Powered Systems", or "POWER (Battery & Battery Charger) for DC-Powered Systems".

Every carrier in the system must be supplied with +5 volt, -48 volt, and -5 volt DC power for the various circuit packs to operate properly. This power is supplied to the carriers as follows: AC from a wall outlet comes into the PDU, which distributes the power via a set of fuses (F1 to F7) to the power units. Each carrier in the system is equipped with two power units: the 631 DA AC power unit and the 631 DB AC power unit, which together supply the required voltages to the carrier. Figure 11-14 illustrates the position of the power unit and the power distribution unit (PDU) and shows which power unit each fuse controls (Figure 11-14 also shows other Environment maintenance-related items that can be ignored for this section on Carrier Port Power Unit). Figure 11-15 illustrates the position of the power unit and the PDU and shows which power unit each fuse controls in a small cabinet (from a System 75 R1V3 upgrade). Figure 11-16 shows the position of the fuses on the PDU and describes how to replace a fuse. The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins. For more information, refer to the "Troubleshooting Backplane Voltage Problems" section found in Chapter 5, "Routine Maintenance Procedures".

The power unit has two LEDs: if the yellow LED is lit it means the power unit is operating as normal; if the red LED is lit it means the power unit has a fault; and if neither is lit it LED means no external power is being supplied. The CARR-POW (Carrier Port Power Unit) MO represents the pair of power units that power each carrier in a multicarrier cabinet system. If a problem is reported by hardware for a power unit on a port carrier, the system can recycle the pair of power units in a port carrier; however, if the problem is reported on a control carrier, the system cannot recycle the pair of power units in a control carrier. In a standard multicarrier cabinet (PPN or EPN) carrier A is the control carrier, and carriers B, C, D, and E are the port carriers. In a High or Critical Reliability system multicarrier cabinet (PPN or EPN), carriers A and B are the control carriers, and carriers C, D, and E are the port carriers. However, carrier B can be recycled only if the Active Expansion Interface Link and Active Tone-Clock circuit pack are in the A carrier.

Loss of the 631 DB Carrier Port DC Power Unit in the active control carrier (the A carrier for a standard system and either the A or B carrier for a High or Critical Reliability system) causes loss of the administration terminal. In a High or Critical Reliability system, the Active SPE should switch to the Standby SPE if there is a CARR-POW alarm.

Recycling a carrier turns off the pair of power units, and turns them back on two seconds later.

WARNING:

Recycling carriers disrupts service for all circuit packs on the carrier.

The DEFINITY Generic 1 can also support neon message waiting lamps on analog telephones. If this is required, then the carrier(s) that contains the TN769 Analog Neon circuit packs must also be supplied with 165 volt to power the neon lights. The 165 volt can only be supplied by a TN752 or a TN755B power unit circuit pack. The following table lists all power unit and power-related circuit packs for the system and indicates the voltages they can supply. Figure 11-14 through Figure 11-19 show a schematic of each power unit type. The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins. Refer to Chapter 2 in *DEFINITY Communications System Generic 1 and Generic 3 Installation and Test*, 555-230-104.

Power Supply	+5	-48V	-5V	165V	Cabinet Position
631 WA	yes	no	no	no	Left Side
631 WB	no	yes	no	no	Right Side
631 AR	yes	no	no	no	Left Side
631 BR	no	yes	no	no	Right Side
631 DA	yes	no	no	no	Left Side
631 DB	no	yes	yes	no	Right Side
TN736	no	no	yes	no	-
TN752	no	no	yes	yes	-
TN755B	no	no	no	yes	-

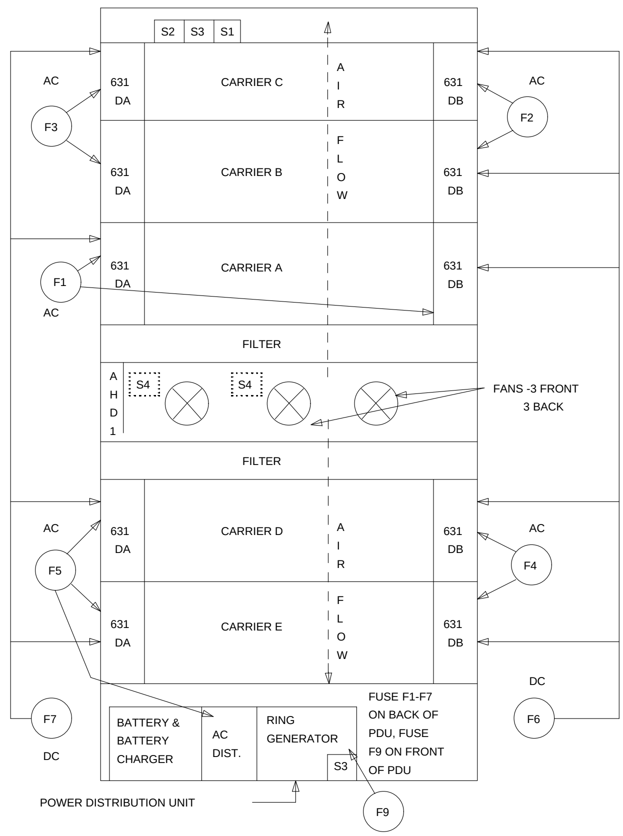

Figure 11-14. Multicarrier Cabinet Environment Components (CARR-POW)

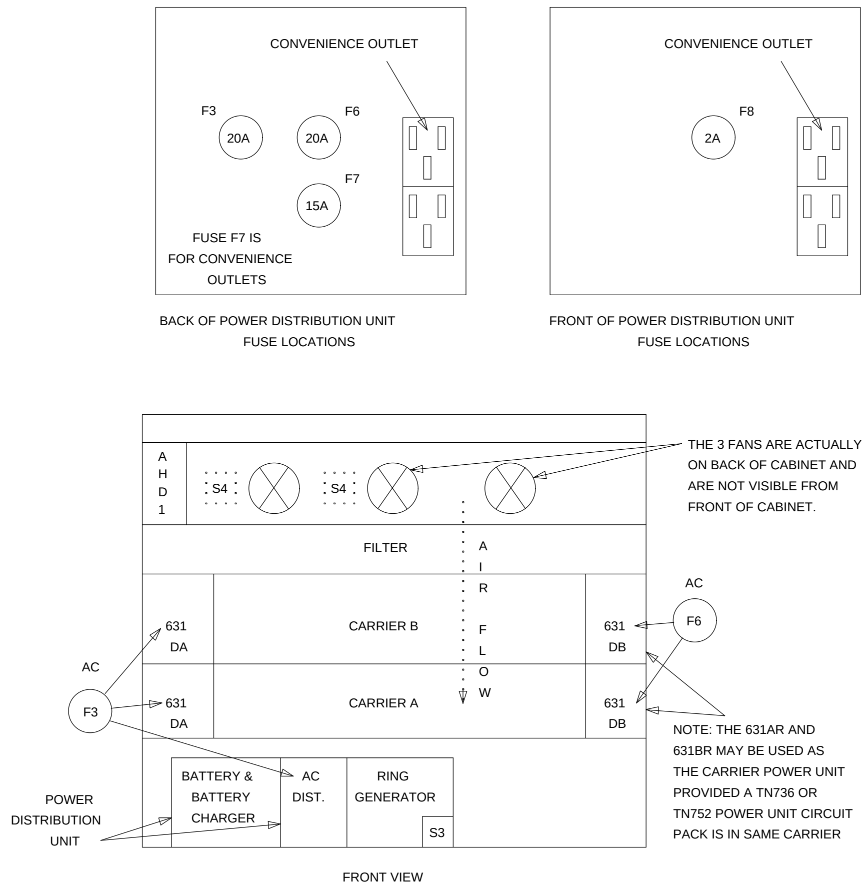

Figure 11-15. Small Cabinet Environment Components (CARR-POW)

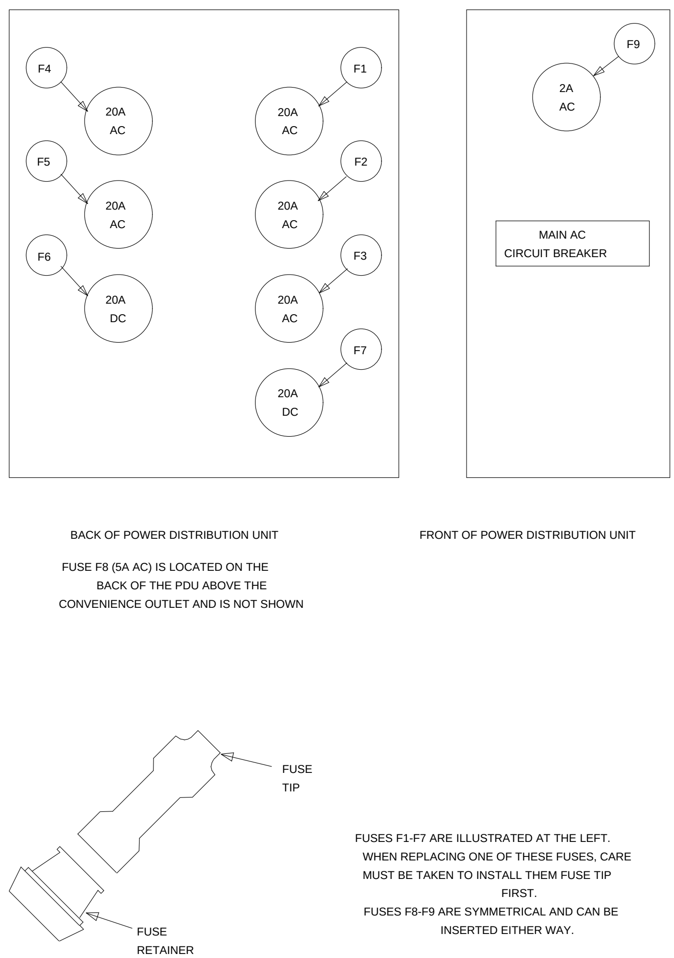

Figure 11-16. Multicarrier Cabinet Fuse Location and Replacement

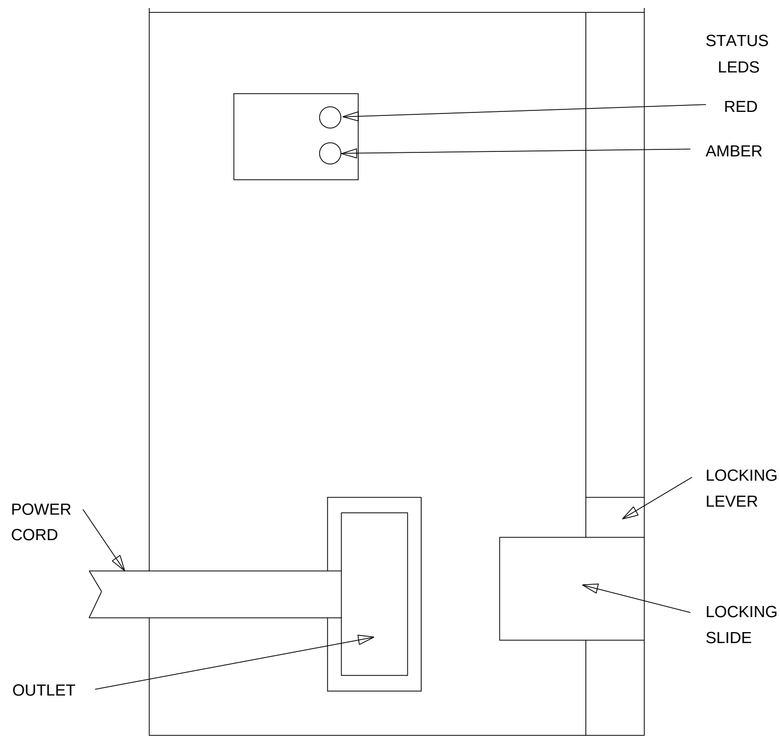

Figure 11-17. 631WA or 631WB AC Power Unit

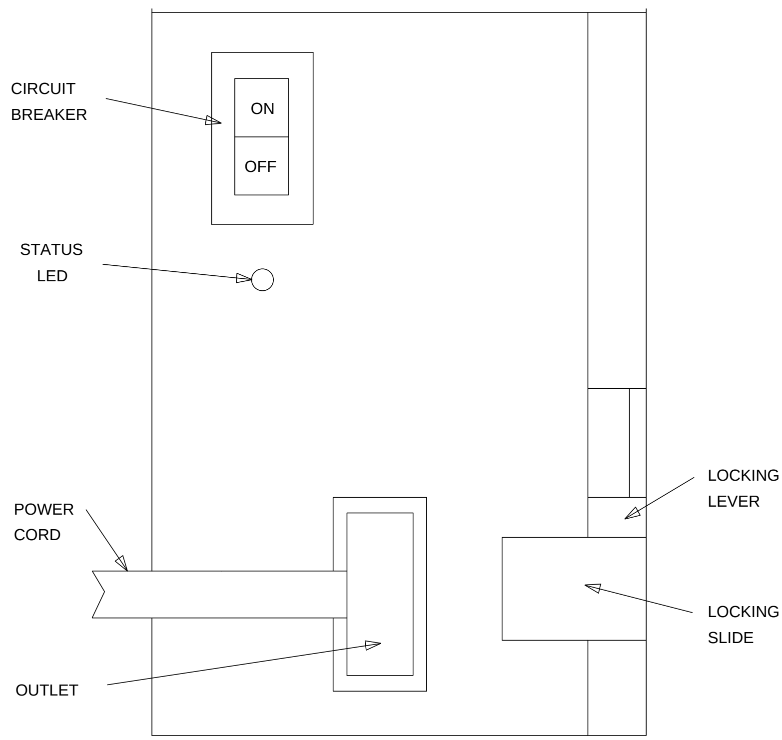

Figure 11-18. 631AR or 631BR AC Power Unit

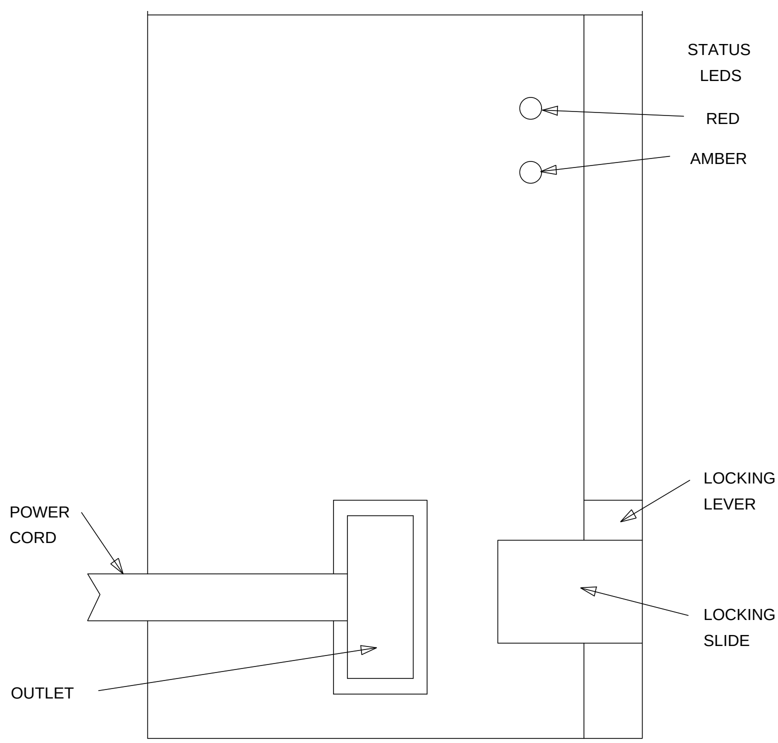

Figure 11-19. 631DA or 631DB AC Power Unit

Power Unit Replacement Procedures

The procedures for replacing the various power units are given below:

Replacing a 631AR or 631BR AC Power Unit

If the power unit to be replaced is in a control carrier of a PPN system, refer to "Removing Power" and "Restoring Power" in Chapter 5, "Routine Maintenance Procedures", before replacing the power unit. To replace the power unit, implement the following steps:

1. Set the power switch to OFF, and unplug the power cord.
2. Move the locking slide on the power unit to its leftmost position and unlatch the locking lever.
3. Remove the power unit from the carrier.
4. Before installing the replacement power unit in the carrier, turn the power unit on its side and operate rocker switches 1 through 4 on the dip switch as follows:

Switch	631AR Position	631BR Position
1	open	open
2	closed	closed
3	open	open
4	closed	open

NOTE:
In the open position, the rocker is down on the side opposite the number. In the closed position, the rocker is down on the side adjacent to the number.

5. Move the locking slide on the replacement power unit to the extreme left position and open the locking lever.
6. Insert the power unit into the carrier until some resistance is felt.
7. Lift the locking lever upward until it latches.
8. Move the locking lever slide on the power unit to the extreme right position.
9. Connect the power cord and set the power switch to ON.

Replacing a 631DA or 631DB AC Power Unit

If the power unit to be replaced is in a control carrier of a PPN system, refer to "Removing Power" and "Restoring Power" in Chapter 5, "Routine Maintenance Procedures" before replacing the power unit. To replace the power unit, follow the procedure below:

1. Unplug the power cord.
2. Move the locking slide on the power unit to the extreme left position and unlatch the locking lever.
3. Remove the power unit from the carrier.
4. Move the locking slide on the replacement power unit to the extreme left position and open the locking lever.
5. Insert the power unit into the carrier until some resistance is felt.
6. Lift the locking lever upward until it latches.
7. Move the locking lever slide on the power unit to the extreme right position.
8. Connect the power cord and set the power switch to ON.

Replacing a TN736 or TN752 Power Unit Circuit Pack

If the TN736 or TN752 power unit circuit pack is in a control carrier of a PPN system, then refer to the "Handling Control Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures". Replacing either power unit interrupts the -5 volt supply to the carrier. This causes all the analog circuit packs in the carrier to fail their Loop Around Tests and may cause failures in circuit packs in the control complex. After the power unit has been replaced, look for alarms against these maintenance objects. If ANL-LINE alarms exist, refer to Test #47 (Loop Around and Conference Test) in ANL-LINE Maintenance documentation. For CO-TRK alarms, refer to Test #33 (Loop Around and Conference Test) in CO-TRK Maintenance documentation.

Hardware Error Log Entries and Test to Clear Values

Carrier Port Power Unit Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
1(a)(b)	0 or 1	Power Unit Query Test (#127)	MAJOR	ON	test environment P r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. Where P is an appropriate port network number taken for the PORT field of the Error Log.

b. Run the Power Unit Query Test (#127) first using the **test environment P r 2** command. Then, if a carrier must be recycled to clear the CARR-POW alarm, use the **recycle carrier PC** command to run the Power Unit Recycle Test (#126). The Power Unit Recycle Test (#126) is not included in either the long or Short Test Sequences.

WARNING:
The Power Unit Recycle Test (#126) is destructive. For more information, refer to the description of this test.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
Power Unit Query Test (carrier E) (#127)	X	X	ND
Power Unit Query Test (carrier D) (#127)	X	X	ND
Power Unit Query Test (carrier A) (#127)	X	X	ND
Power Unit Query Test (carrier B) (#127)	X	X	ND
Power Unit Query Test (carrier C) (#127)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Temperature Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to POWER (Battery & Battery Charger) Maintenance documentation for a description of this test.

b. Refer to AC-POWER (AC Power) Maintenance documentation for a description of this test.

c. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

d. Refer to CABINET (Cabinet Sensors) Maintenance documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test. This test only shows up in the test sequence if there is a TN768 Tone-Clock circuit pack in the port network being tested.

Power Unit Recycle Test (#126)

This test is destructive.

This test is destructive because it requires all circuit packs in the recycled carrier to be removed and inserted. These actions cause all calls originating or terminating on circuit packs in this carrier to be dropped. The pair of power units in the specified carrier is recycled. Both power units in the carrier are turned off for two seconds and then back on again. After the power units have been turned back on, the test queries the Maintenance/Tape Processor in Standard system PPN, the Duplication Interface circuit pack in a PPN for a system with High or Critical Reliability, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of pair of power units in the specified carrier. If both power units are on and functioning, then the test passes. If both power units are not on and functioning, the test fails, and BOTH power units are turned off.

Table 11-61. TEST #126 Power Unit Recycle Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1129	ABORT	Only occurs when recycling carrier 2B. Indicates that the Active Tone-Clock for the EPN is in carrier 2B. 1. Issue the **set tone-clock 2A** command. 2. Rerun the test.
1130	ABORT	Only occurs when recycling carrier 2B. Indicates that the Active Expansion Interface Link for the EPN is in carrier 2B. 1. Issue the **set expansion-link A01** command. 2. Rerun the test.

Continued on next page

Table 11-61. TEST #126 Power Unit Recycle Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1 (Carrier E) 2 (Carrier D) 4 (Carrier A) 8 (Carrier B) 16 (Carrier C)	FAIL	There is a problem with one or both Power Unit(s) on the recycled carrier. 1. Since the Power Unit Recycle Test failed, both Power Units in the recycled carrier should have been powered off by the system software. Both power units should be showing a red status LED, instead of a green one. Since the Power Unit Query Test is a subset of the Power Unit Recycle Test, the Power Unit Query Test (#127) should also fail. Run the Power Unit Query Test by using the **test environment P** command where P is the appropriate port network number. 2. If the test fails, follow the repair procedures described for Test #127. If problem persists, follow normal escalation procedures.
	PASS	Both power units in the recycled carrier were found to be healthy by the Maintenance/Tape Processor in a Standard system PPN, the Duplication Interface circuit pack in a PPN for a system with High or Critical Reliability, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system after the power units were powered down and back up. If the status LEDs on both power units are not showing green, then the PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack may have incorrectly reported the state of the power units. Look for and resolve any alarms on these MOs.

Power Unit Query Test (#127)

This test queries the Maintenance/Tape Processor in a Standard system PPN, the Duplication Interface circuit pack in a PPN for a system with High or Critical Reliability, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of pair of power units in the specified carrier. If both power units are on and functioning, then the test passes. If both are not on and functioning, it fails.

Table 11-62. TEST #127 Power Unit Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Then, repeat the test. 3. If the test continues to ABORT with a 2000 error code, check for and resolve all DUPINT (Duplication Interface) errors in a Duplicated Option PPN, PR-MAINT (Maintenance/Tape Processor) errors in a standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 4. If the test continues to ABORT with a 2000 error code, escalate the problem.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-62. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	There is a problem with one or both power units on the tested carrier. 1. For each power unit that has all sttus LEDs OFF, check the AC input to the power unit at the power unit outlet (see Figure 11-14 and Figure 11-15). If there is no AC, then check the appropriate fuses (see Figure 11-16) for the affected power unit. If the fuses are blown out, replace the fuses (see). If the fuses blow out again or AC does not show up at the power unit outlet, then there is probably a power wiring problem in the cabinet. Follow normal escalation procedures. 2. At this point AC should be present at the power unit outlet. If the carrier being tested is the 1A or 2A carrier or the 1B carrier in a High or Critical Reliability system, refer to "Troubleshooting Control Carrier Power Units" in Chapter 5, "Routine Maintenance Procedures". Otherwise, use the **recycle carrier PC** command (where PC is the appropriate port network and carrier) in an attempt to bring back the power units for this carrier. If the test passes, the trouble is cleared. If the test does not pass, one power unit, or both, in the tested carrier is defective. If only one power unit is defective, the status LEDs on the healthy power unit light green for a moment. When the recycle test determines that both power units are defective, the software turns off power to both the good and defective power units. This causes the status LED(s) on the good power unit to light red. 3. Unplug both power units, and wait about one minute to allow the power units to cool down. Plug in the power units. If either power unit is operating properly (that is, the status LEDs show green), then replace the defective power unit(s). See "Power Unit Replacement Procedures" in this section.

Continued on next page

Table 11-62. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	4. If the replaced power unit still does not operate properly, then a circuit pack or a defective telephone connected to a circuit pack in the affected carrier may be causing an electrical load which is preventing the power unit from operating properly. Unseat all the circuit packs in the carrier and reissue the **recycle carrier** command. a. If the recycle passes, then the power units are healthy, and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, replace the defective circuit pack. If the status LED still shows red, remove the Amphenol. connector on the back of the slot containing this circuit pack and reissue the **recycle carrier** command. If the status LED shows green, the problem is with one of the telephones or the wiring to one of the telephones on this slot. If the status LED still shows red, escalate the problem. b. If either power unit still shows a red status LED, check for bent pins and cable placement in the affected carrier. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that **are not** detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If no other problems can be found, escalate the problem.

Continued on next page

Table 11-62. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Both power units in the tested carrier were found to be healthy by the Maintenance/Tape Processor in Standard system PPN, the Duplication Interface circuit pack in a PPN for a system with High or Critical Reliability, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system. If the status LEDs on both power units are not showing green, the PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack may have incorrectly reported the state of the power units. Look for and resolve any alarms on these MOs.

CARR-POW (Carrier Port Power Unit) for DC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CARR-POW	MAJOR	recycle carrier PC	Carrier Port Power Unit

1 Recycle the carrier indicated by the Port field in the Alarm Log.

Generic 1 offers two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, the PPN or EPN cabinet configuration aspects for a High or Critical Reliability system are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate MO section(s).

- For a single-carrier cabinet system, refer to the "DC-POWER (Single-Carrier Cabinet Power)" Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for AC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for AC-Powered Systems", or "POWER (Battery & Battery Charger) for AC-Powered Systems".
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: "AC-POWER (AC Power) for DC-Powered Systems", "CARR-POW (Carrier Port Power Unit) for DC-Powered Systems", or "POWER (Battery & Battery Charger) for DC-Powered Systems".

Every carrier in the system must be supplied with +5 volt, -48 volt, and -5 volt DC power for the various circuit packs to operate properly. A multicarrier system can be supplied by an external AC power source or an external DC power source.

In a DC-powered system, power is supplied to the carriers as follows: DC power from an external device comes into Power Distribution Units (PDU J58890CF and PDU J58890CF-1), which distribute the power via circuit breakers (CB1-CB12 for PDU J58890CF, CB1-CB6 for J58890Cf-1) to the carrier power units. Each carrier in the system is equipped with two power units, the 644A and the 645B, which together supply the required voltages to the carrier. Figure 11-19 illustrates the position of the carrier power units and PDU J58890CF and shows which power unit each circuit breaker controls (Figure 11-19 also shows other Environment maintenance-related items that can be ignored for this section on Carrier Port Power Unit). Figure 11-20 shows the position of the circuit breakers on the PDU J58890CF. Figure 11-21 illustrates the position of the carrier power units and PDU J58890CF-1 and shows which power unit each circuit breaker controls (Figure 11-21 also shows other Environment maintenance-related items that can be ignored for this section on Carrier Port Power Unit). Figure 11-22 shows the position of the circuit breakers on the PDU J58890CF-1. The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins. Refer to Chapter 2 in *DEFINITY Communications System Generic 1 and Generic 3 Installation and Test,* 555-230-104. The CARR-POW (Carrier Port Power Unit) MO represents the pair of power units for each carrier in a multicarrier cabinet system. If a problem is reported by hardware for a power unit on a port carrier, the system can recycle the pair of power units in a port carrier; however, if the problem is reported on a control carrier, the system cannot recycle the pair of power units in a control carrier. In a standard multicarrier cabinet (PPN or EPN), carrier A is the control carrier, and carriers B, C, D, and E are the port carriers. In a High or Critical Reliability system multicarrier cabinet (PPN or EPN), carriers A and B are the control carriers, and carriers C, D, and E are the port carriers. However, carrier B in the EPN can be recycled only if the Active Expansion Interface Link and Active Tone-Clock circuit pack are in the A carrier.

The carrier port power unit has one LED: the yellow LED on means operating as normal and the LED off means no external power is being supplied or that the power unit has a fault.

Loss of the 645B Carrier Port Power Unit in the active control carrier (the A carrier for a standard system and either the A or B carrier for a High or Critical Reliability system) causes loss of the administration terminal. In a High or Critical Reliability system, the Active SPE should switch to the Standby SPE if there is a CARR-POW alarm.

Recycling a carrier turns off the pair of carrier power units and turns them back on two seconds later.

WARNING:

Recycling carriers disrupts service for all circuit packs on the carrier.

Generic 1 can also support neon message waiting lamps on analog telephones. If this is required, then the carrier(s) that contains the TN769 Analog Neon circuit packs must also be supplied with 165 volt DC power to power the neon lights. The 165 volt DC power can only be supplied by a TN752 or a TN755B power unit circuit pack. The following table lists the power units and power-related circuit packs that can be used in a DC-powered system and indicates the voltages they can supply. Figure 11-23 and Figure 11-24 show a schematic of the 644A and 645B power supplies, respectively. The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins. Refer to Chapter 2 in *DEFINITY Communications System Generic 1 and Generic 3 Installation and Test,* 555-230-104.

Power Supply	+5V	-48V	-5V	165V	Cabinet Position
644A	yes	no	no	no	Left Side
645B	no	yes	yes	no	Right Side
TN736	no	no	yes	no	-
TN752	no	no	yes	yes	-
TN755B	no	no	no	yes	-

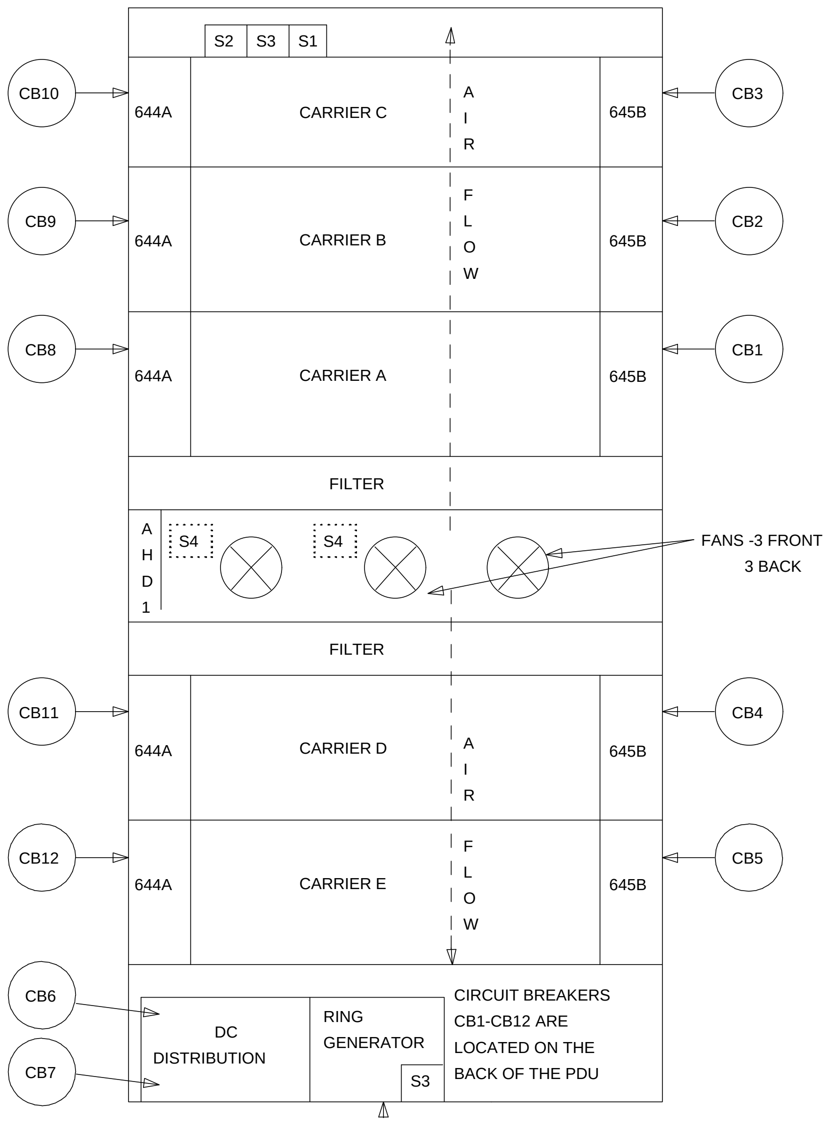

Figure 11-20. Power Distribution Unit for DC-Powered Systems (PDU8890CF)

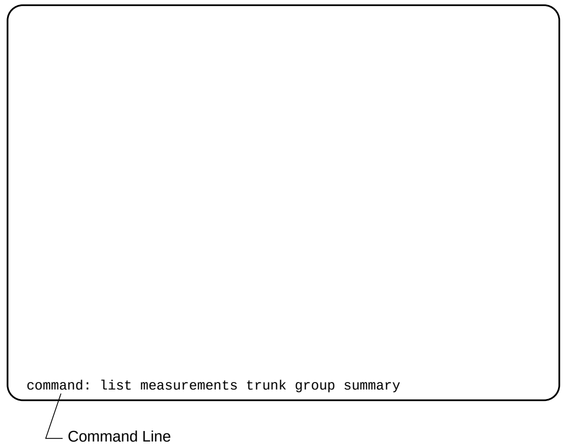

Figure 11-21. Power Distribution Unit for DC-Powered Systems (PDU 58890CF)

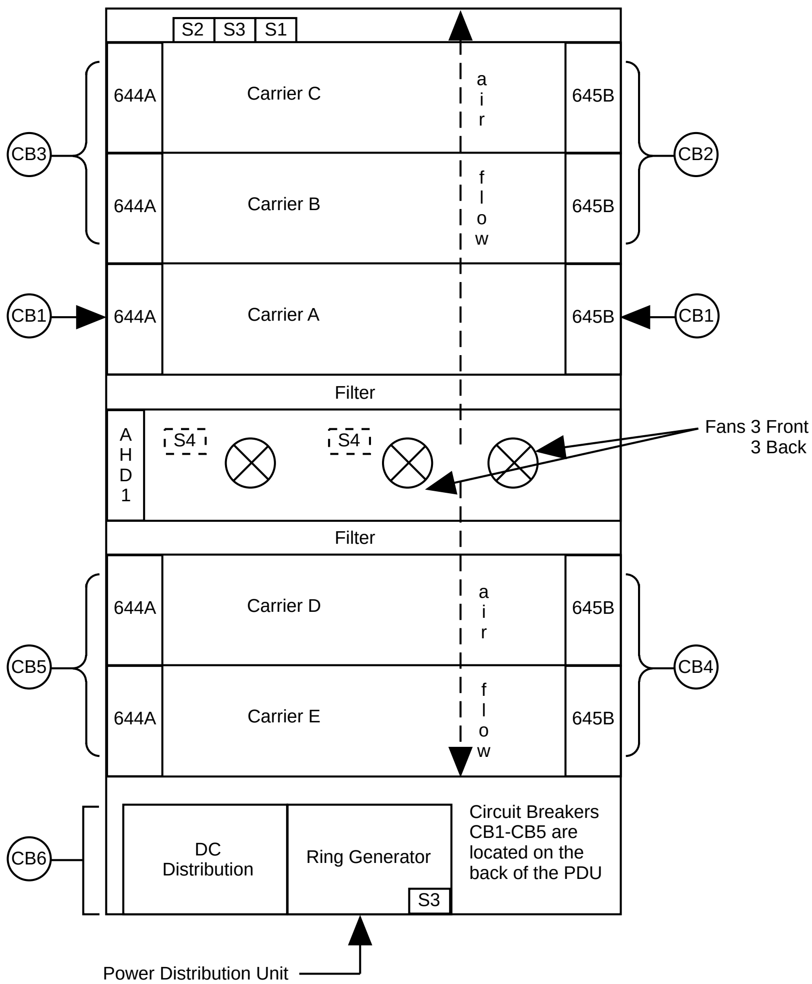

Figure 11-22. Power Distribution Unit for DC-Powered Systems (PDU8890CF-1)

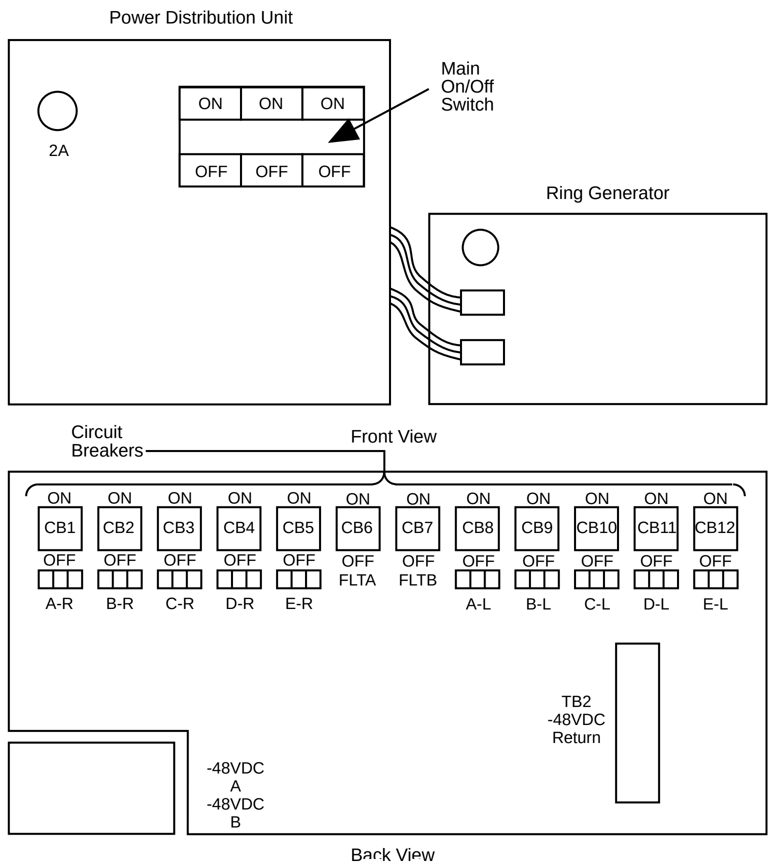

Figure 11-23. Power Distribution Unit for DC-Powered Systems (PDU 58890CF-1)

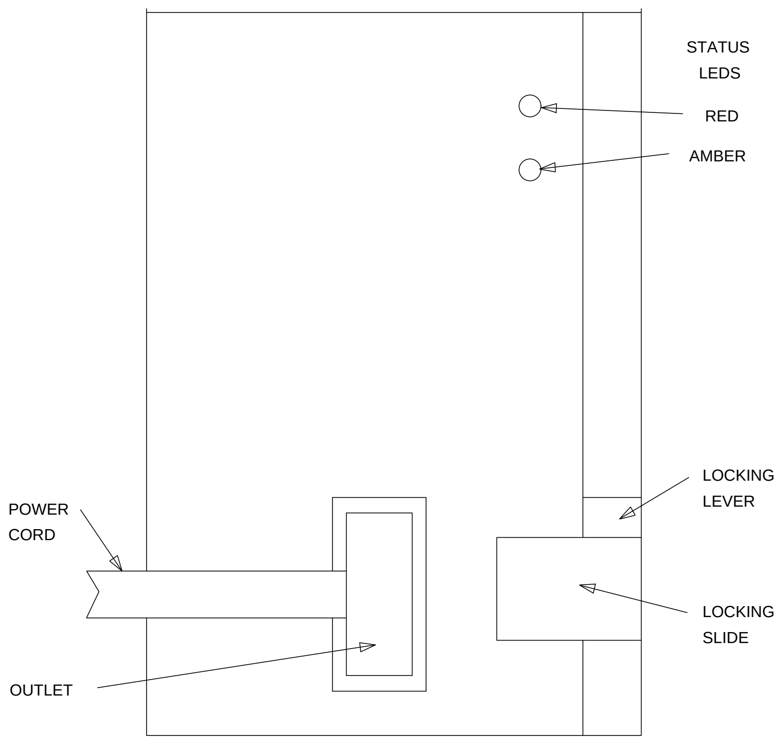

Figure 11-24. 644A Port Carrier Power Unit for DC-Powered Systems

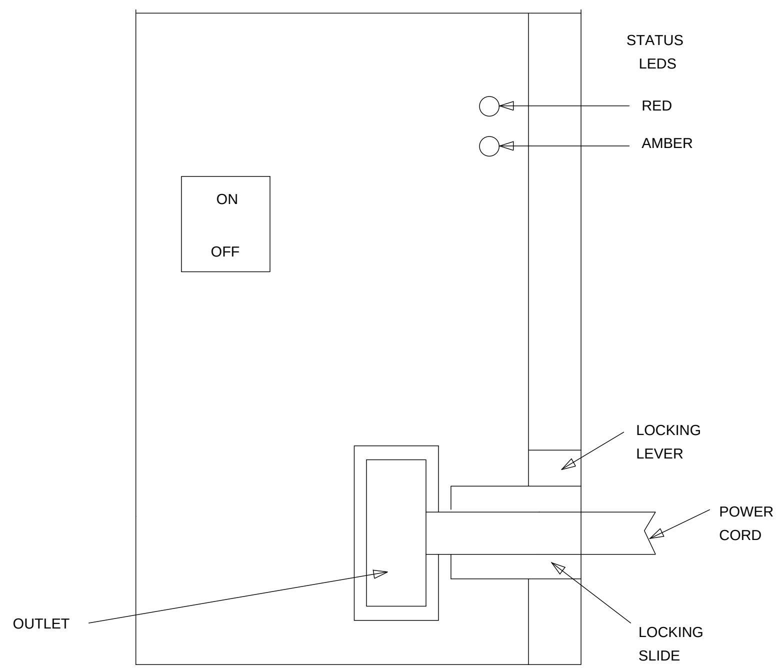

Figure 11-25. 645B Port Carrier Power Unit for DC-Powered Systems

Port Carrier Power Unit Replacement Procedures

The procedures for replacing a 644A or 645B carrier DC power unit are given below.

If the port carrier power unit to be replaced is in a control carrier of a PPN system, refer to the "Removing Power" and "Restoring Power" sections in Chapter 5, "Routine Maintenance Procedures" before replacing the port carrier power unit. To replace the port carrier power unit, follow the procedure below:

1. If this is a 645B power unit, set the power switch to OFF.
2. Unplug the power cord.
3. Move the locking slide on the power unit to the extreme left position, and unlatch the locking lever.
4. Remove the power unit from the carrier.

5. Move the locking slide on the replacement power unit to the extreme left position and open the locking lever.
6. Insert the power unit into the carrier until some resistance is felt.
7. Lift the locking lever upward until it latches.
8. Move the locking lever slide on the power unit to the extreme right position.
9. Connect the power cord.
10. If this is a 645B power unit, set the power switch to ON.

Hardware Error Log Entries and Test to Clear Values

Carrier Port Power Unit Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
1(a)(b)	0 or 1	Power Unit Query Test (#127)	MAJOR	ON	test environment P r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. Where P is an appropriate port network number taken for the Port field of the Error Log.

b. Run the Power Unit Query Test (#127) first using the **test environment P r 2** command. Then, if a carrier must be recycled to clear the CARR-POW alarm, use the **recycle carrier PC** command to run the Power Unit Recycle Test (#126). The Power Unit Recycle Test (#126) is not included in either the long or Short Test Sequences.

WARNING:
The Power Unit Recycle Test (#126) is destructive. For more information, refer to the description of this test.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
Power Unit Query Test (carrier E) (#127)	X	X	ND
Power Unit Query Test (carrier D) (#127)	X	X	ND
Power Unit Query Test (carrier A) (#127)	X	X	ND
Power Unit Query Test (carrier B) (#127)	X	X	ND
Power Unit Query Test (carrier C) (#127)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Temperature Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to POWER (Battery & Battery Charger) Maintenance documentation for a description of this test.

b. Refer to AC-POWER (AC Power) Maintenance documentation for a description of this test.

c. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

d. Refer to CABINET (Cabinet Sensors) Maintenance documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test.

NOTE:
This test only shows up in the test sequence if there is a TN768 Tone-Clock circuit pack in the port network being tested.

Power Unit Recycle Test (#126)

This test is destructive.

This test is destructive because it requires all circuit packs in the recycled carrier to be removed and inserted. These actions cause all calls originating or terminating on circuit packs in this carrier to be dropped. The pair of port carrier power units in the specified carrier is recycled. Both port carrier power units in the carrier are turned off for two seconds and then back on. After the port carrier power units have been turned back on, the test queries the Maintenance/Tape Processor in Standard system PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of the pair of port carrier power units in the specified carrier. If both port carrier power units are on and functioning, then the test passes. If both port carrier power units are not on and functioning, the test fails, and BOTH port carrier power units are turned off.

Table 11-63. TEST #126 Power Unit Recycle Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1129	ABORT	Only occurs when recycling carrier 2B. Indicates that the Active Tone-Clock for the EPN is in carrier 2B. 1. Issue the **set tone-clock 2A** command. 2. Rerun the test.
1130	ABORT	Only occurs when recycling carrier 2B. Indicates that the Active Expansion Interface Link for the EPN is in carrier 2B. 1. Issue the **set expansion-link A01** command. 2. Rerun the test.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 11-63. TEST #126 Power Unit Recycle Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1 (Carrier E) 2 (Carrier D) 4 (Carrier A) 8 (Carrier B) 16 (Carrier C)	FAIL	There is a problem with one or both port carrier power units on the recycled carrier. 1. Since the Power Unit Recycle Test failed, both port carrier power supplies in the recycled carrier should have been powered off by the system software. Both port carrier power units should be showing a red status LED, instead of a green one. Since the Power Unit Query Test is a subset of the Power Unit Recycle Test, the Power Unit Query Test (#127) should also fail. Run the Power Unit Query Test by using the **test environment P** command where P is the appropriate port network number. 2. If the test fails, follow the repair procedures described for Test #127. If the problem persists, follow normal escalation procedures.
	PASS	Both port carrier power units in the recycled carrier were found to be healthy by the Maintenance/Tape Processor in Standard system PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system after the port carrier power units were powered-down and powered up again. If the status LEDs on both port carrier power units are not showing green, then the PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack may have incorrectly reported the state of the port carrier power units. Look for and resolve any alarms on these MOs.

Power Unit Query Test (#127)

This test queries the Maintenance/Tape Processor in a Standard system PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system for the status of the pair of port carrier power units in the specified carrier. If both port carrier units are on and functioning, the test passes. If both are not on and functioning, the test fails.

Table 11-64. TEST #127 Power Unit Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-64. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	There is a problem with one or both port carrier power units on the tested carrier. 1. For each port carrier power unit that has all status LEDs OFF, check the DC input to the port carrier power unit at the port carrier power unit outlet (see Figures 11-19 through 11-22). If there is no DC, then check the appropriate circuit breakers for the affected port carrier power unit. If the circuit breaker has tripped (that is, it is in the down position), reset the circuit breaker. If the circuit breaker trips again or DC is not present at the port carrier power unit outlet, there is probably a power wiring problem in the cabinet. Follow normal escalation procedures. 2. At this point, DC should be present at the port carrier power supply outlet. If the carrier being tested is the 1A or 2A carrier, or the 1B carrier in a High or Critical Reliability system, refer to"Troubleshooting Control Carrier Power Units"" in Chapter 5, "Routine Maintenance Procedures". Otherwise, use the **recycle carrier PC** command (where PC is the appropriate port network and carrier) in an attempt to bring back the power units for this carrier. If the test passes, the trouble is cleared. If the test does not pass, one port carrier power unit, or both, in the tested carrier is defective. If only one port carrier power unit is defective, the status LEDs on the healthy port carrier power unit light green for a moment. When the recycle test determines that both port carrier power units are defective, the software turns off power to both the good and defective port carrier power units. This causes the status LED(s) on the good port carrier power unit to light red.

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Table 11-64. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	3. Unplug both port carrier power units, and wait about one-minute to allow the port carrier power units to cool down. Plug in the port carrier power units. If either port carrier power unit is operating properly (that is, the status LEDs show green), then replace the defective port carrier power unit(s). See "Port Carrier Power Unit Replacement Procedures" in this section. 4. If the replaced port carrier power unit(s) still does (do) not operate properly, then a circuit pack or a defective telephone connected to a circuit pack in the affected carrier could be causing an electrical load which is preventing the port carrier power unit from operating properly. Unseat all the circuit packs in the carrier, and reissue the **recycle carrier** command. a. If the recycle passes, then the port carrier power units are healthy, and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, replace the defective circuit pack. If the status LED still shows red, remove the Amphenol connector on the back of the slot containing this circuit pack and reissue the **recycle carrier** command. If the status LED shows green, the problem is with one of the telephones or the wiring to one of the telephones on this slot. If the status LED still shows red, escalate the problem. b. If either port carrier power unit still shows a red status LED, check for bent pins and cable placement in the affected carrier. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that **are not** detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If no other problems can be found, escalate the problem.

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Table 11-64. TEST #127 Power Unit Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Both port carrier power units in the tested carrier were found to be healthy by the Maintenance/Tape Processor in a PPN for a High or Critical Reliability system, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN multicarrier cabinet system. If the status LEDs on both port carrier power units are not showing green, the PR-MAINT (Maintenance/Tape Processor), DUPINT (Duplication Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack may have incorrectly reported the state of the port carrier power units. Look for and resolve any alarms on these MOs.

CLSFY-BD (Call Classifier Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CLSFY-BD	MIN	test board PCSS sh	Call Classifier Circuit Pack
CLSFY-BD	WRN	test board PCSS sh	Call Classifier Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also Call Classifier Port (CLSFY-PT) Maintenance documentation for related port information.

CLSFY-PT (Call Classifier Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CLSFY-PT(a)	MAJOR	test port PCSSpp sh	Call Classifier Port Maintenance
CLSFY-PT	MINOR	test port PCSSpp sh	Call Classifier Port Maintenance
CLSFY-PT	WARNING	release port PCSSpp	Call Classifier Port Maintenance

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (e.g., A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (e.g., 01, 02, ..., etc.); and pp is the 2-digit port number (e.g.., 01).

The TN744 Call Classifier (CLSFY-BD) circuit pack is a service circuit pack that enables usage of the Outbound Call Management (OCM) and the Inbound Call Management (ICM) features. On a G3iV2-386 system, the TN744 also enables usage of R2-MFC signaling for incoming and outgoing feature operation. There are eight ports (CLSFY-PTs) on the Call Classifier circuit pack. Each port can handle call classification, touch-tone reception, or, for G3iV2-386 systems, MFC tone generation and detection or touch-tone reception.

The CLSFY-PT maintenance feature defines a set of tests to ensure that the Call Classifier circuit pack ports are capable of detecting tones for call classification, and detecting and generating necessary tones for correct MFC feature operation.

Hardware Error Log Entries and Test to Clear Values

Call Classifier Port (CLSFY-PT) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1	any	Tone Detector Audit/Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 2
18		Port has been busied out by system technician	WARNING	OFF	release port PCSSpp
257 (b)	17666	Test (#43)	MAJOR/ MINOR(a)	ON	test port PCSSpp r 3
513 (c)	any	Tone Detection Verification Test (#42)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3

Notes:

a. There are two possible alarm levels for this error type: major alarm and minor alarm. A major alarm is raised if the total number of call classifier ports currently in-service is less than or equal to 1/2 of the administered threshold number. Otherwise, a minor alarm is raised. In either case, run the short test sequence against the port and follow the error code procedures for the individual tests.

   The threshold number of call classifier ports for service is administered using the **change system-parameters maintenance** command. For details, refer to Chapter 5, 'Routine Maintenance Procedures".

b. The call classifier port lost its translation. Testing the call classifier port is sufficient to reload its translation. If testing the call classifier port does not clear the error, then the call classifier circuit pack containing the defective call classifier port should be replaced.

c. This error indicates the call classifier port is having problems detecting system tones (DTMF, etc.) or detecting and generating necessary R2-MFC tones. This error should accompany some percentage of failed calls. If this error type is persistently logged, then the call classifier circuit pack containing the defective call classifier port should be replaced.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Tone Detection Verification Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detection Audit/Update Test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test checks out each port in both the touch-tone receiver mode and in the R2-MFC tone detection/generation mode. During the first half of the test, the touch-tone receiver mode is tested. In the second half of the test, each port is put into the R2-MFC mode. During this portion of the test, each port's ability to accurately detect and generate all forward and backward MFC tones is verified.

Table 11-65. TEST #42 Tone Detection Verification Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test OR there was an Internal System Error.
1	ABORT	The system could not allocate all the resources needed to test the tones.
1001	ABORT	The system was unable to put the Call Classifier port in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This situation could occur when the system is heavily loaded. If the system is not heavily loaded, then test the TDM-BUS via the **test tdm [1|2]** command. Refer to the TDM-BUS (TDM Bus) Maintenance documentation for details. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-65. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a Tone-Clock circuit pack for the test connection. This situation could occur when the system is heavily loaded or if a Tone-Clock circuit pack is not present in the port network when this test is executed. 1. Verify the existence of a Tone-Clock circuit pack in the same port network. 2. If a Tone-Clock circuit pack is missing, install one in the same port network. 3. Allow approximately one minute for the Tone-Clock circuit pack maintenance to run on the newly inserted Tone-Clock circuit pack. 4. Retry the command at one minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.

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Table 11-65. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2006	ABORT	This abort code indicates that the active Tone-Clock circuit pack might not be functioning properly. If there is more than one Tone Detector circuit pack in the system, then the problem can be either with the Tone-Clock circuit pack or the Tone Detector circuit pack. This could also be caused by the companding mode administered for the system not matching that of the Tone Detector circuit pack [G3iV2-386]. 1. [G3iV2-386] Make sure that the companding mode of the system matches that of the Tone Detector (TN748 for Mu-law systems and TN420 for A-law systems). 2. Test the active Tone-Clock circuit pack in the port network. This test is being executed via the **test tone-clock qualifier** system technician command. ("qualifier" is the carrier of the active Tone-Clock circuit pack to be tested. Valid qualifiers are: a, b, 1a, 1b, 2a, and 2b.) Refer to the TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for details. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-65. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1-3	FAIL	DTMF digits were not detected correctly. This may or may not impact reception of R2-MFC calls. 1. Run the short test sequence via the **test port PCSSpp sh r 1** command. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore system performance to normal, replace the Call Classifier circuit pack containing the defective CLSFY-PT (Call Classifier Port).
101-122	FAIL	Forward or Backward MFC signals were not correctly generated or detected. This impacts reception of incoming MFC calls. 1. Run the short test sequence via the **test port PCSSpp sh r 1** command. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore system performance to normal, replace the Call Classifier circuit pack containing the defective CLSFY-PT (Call Classifier Port).
	PASS	Tone Detection Verification is successful. The Call Classifier Port (CLSFY-PT) is able to detect/generate all necessary tones.

Tone Detector Audit/Update Test (#43)

A sanity audit is performed on the CLSFY-PT (Call Classifier Port).

Table 11-66. Tone Detector Audit/Update Test (#43)

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test. 1. Wait one-minute, and repeat the command a maximum of five times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Hardware audit failed. 1. Run the short test sequence via the **test port PCSSpp sh r 1** command. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore system performance to normal, replace the CLSFY-BD (Call Classifier circuit pack) containing the defective CLSFY-PT (Call Classifier Port).
	PASS	The (CLSFY-PT) Call Classifier Port has passed the sanity inquiry.

CO-BD (Central Office Trunk Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CO-BD	MIN	test board PCSS sh	Central Office Trunk Circuit Pack
CO-BD	WRN	test board PCSS sh	Central Office Trunk Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also CO-TRK (CO Trunk) Maintenance documentation for related trunk information.

CO-DS1 (DS1 CO Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
CO-DS1	MAJOR[1]	test trunk <grp/mbr> l	DS1CO Trunk
CO-DS1	MINOR	test trunk <grp/mbr> l	DS1CO Trunk
CO-DS1	WARNING	test trunk <grp/mbr>	DS1CO Trunk

1 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

A DS1CO (central office) trunk provides a communications channel between the system and a central office switch through either a 1.544 Mbps or a 2.048 Mbps [G3iV2-386] DS1 link. A 24 channel DS1 link consists of 24 digital DS1CO trunks. A 32 channel DS1 link [G3iV2-386] consists of 30 digital DS1CO trunks. A DS1CO trunk can be used for both voice and data communication.

The DS1CO Trunk Maintenance provides a strategy in the system to maintain a CO trunk via a port on the DS1 Interface circuit pack. The TN767 and TN464 [G3iV2-386] DS1 Interface circuit packs support the low level CO trunk signaling interfaces, ground-start and loop-start. This strategy covers the in-line errors log, initialization tests, periodic tests, system technician-demanded tests, and alarm resolution and escalation.

Three trunk service states are specified in the DS1CO trunk maintenance. They are: *out-of-service* in which the trunk is in a deactivated state and cannot be used for either incoming or outgoing calls; *in-service* in which the trunk is in an activated state and can be used for both incoming and outgoing calls; *disconnect* (ready-for-service) in which the trunk is in an activated state but can only be used for an incoming call. If the DS1 Interface circuit pack is out-of-service, then all trunks on the DS1 Interface circuit pack are also in the out-of-service state, and a Warning alarm is raised for each trunk.

Hardware Error Log Entries and Test to Clear Values

DS1CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test trunk <grp>/<mbr>
1 (a)	57408				
1 (a)	57487				
15 (b)	Any	Port Audit and Update Test (#36)			
18 (c)	0	busyout trunk <grp>/<mbr>	WARNING	OFF	release trunk <grp>/<mbr>
130 (d)		None	WARNING	ON	test trunk <grp>/<mbr>
257 (e)	57392	DS1 CO Dial Tone Seizure Test (#314)	MIN/MAJ[2]	OFF	
513 (f)	57393	DS1 CO Dial Tone Seizure Test (#314)	MIN/MAJ[2]	OFF	
769 (g)	57484				
1025		DS1CO Dial Tone Seizure Test (#314)	WARNING	OFF	test trunk <grp>/<mbr>
1281		Conference Circuit Test (#7)	MAJ/MIN/ WRN[3]	ON	test trunk <grp>/<mbr> r 4
1537		NPE Crosstalk Test (#6)	MAJ/MIN/ WRN[3]	ON	test trunk <grp>/<mbr> r 3
1793 (h)				ON	test board PCSS l
2562(i))	16665				
2817(j)	52992				
3840 (k)		Port Audit and Update Test (#36)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 Minor alarms on this maintenance object (MO) may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this group are alarmed.

Notes:

a. Error Type 1—Aux Data 57408—No tip ground is detected on an outgoing call.

   Aux Data 57487—PBX could not get "loop close" signal (TN767).

   The DS1 Interface circuit pack detected a hardware fault. These errors cause the Dial Tone Test (#314) to run and are only considered a problem if the Dial Tone Test fails (in which case Error Type 1025 also shows up). In this case, the trunk may be put in ready-for-service state (shown as "disconnected" by status command), which allows only incoming calls. Run the Dial Tone Test (#314) and follow its outlined procedures.

b. Error Type 15—This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate associated errors (if any).

c. Error Type 18—System Technician has busied-out the trunk to the out-of-service state. No calls can be made on this trunk except the Facility Access Test Call. For details on this feature, refer to "Facility Test Calls" section in Chapter 5, "Routine Maintenance Procedures".

d. Error Type 130—This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. Error Type 257—The DS1 Interface circuit pack detects a hardware fault. The Aux Data field contains the following error type: 57392—no external release on PBX disconnect [E030]. Escalate the problem.

f. Error Type 513—The DS1 Interface circuit pack detects a hardware fault. The Aux Data field contains the following error type: 57393—belated external release on PBX disconnect [E031]. Escalate the problem.

g. Error Type 769—The DS1 Interface circuit pack detects a hardware fault. The Aux Data field contains the following error type:—57484, fault is detected on tip/ring [E08C]. Escalate the error.

h. Error Type 1793—DS1 Interface circuit pack is out-of-service. Look for DS1-BD errors in the Hardware Error Log. Refer to the DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation for details.

i. Error Type 2562—Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

j. Error Type 2817—Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a two-way trunk from both the near-end and the far-end. Attempt to place the call again. If the error persists, execute the Dial Tone Seizure Test (#314) and follow those procedures.

k. Error Type 3840—Port Audit and Update Test (#36) failed due to an internal system error. Enter the **status trunk** command to verify the status of the trunk. If the trunk is out-of-service, then enter the **release trunk** command to put it back into in-service. Retry the test command. If the test continues to abort, then escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1CO Trunk Seizure Test (#314)	X	X	ND
Port Audit and Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) resides on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-67. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-67. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to the TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a user for a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-67. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors was found on the DS1 circuit pack: loss of signal (1281), blue alarm (1793), red alarm (2049), yellow alarm (2305), or hyperactivity (1537). 1. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.
	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

Continued on next page

Table 11-67. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive (see note below). 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted. **NOTE:** Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing the **list config** command but the 'Vintage' field reports that there is no board (when there really is a board), then the **busyout board** and the **release busy board** commands will not work (even though the **reset board** command will work). The software will put the hyperactive board back in service after the hyperactivityclears.

Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 11-68. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The test was aborted. System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-68. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The test was aborted. The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. Refer to the TDM-BUS (TDM bus) maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. 1. Look for TTR-LEV errors in the error log. If present, refer to the TTR-LEV maintenance documentation. 2. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT maintenance documentation. 3. If neither condition exists, retry the test at 1-minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.

Continued on next page

Table 11-68. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	The test was disabled via translation. You may want to determine why the test has been disabled before you enable it. 1. Verify that the 'Maintenance Test' field on the 'Trunk Administration' screen is set to 'n.' To enable the test, change the trunk administration and enter 'y' into the 'Maintenance Test' field. 2. Repeat the test.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors was found on the DS1 circuit pack: loss of signal (1281), blue alarm (1793), red alarm (2049), yellow alarm (2305), or hyperactivity (1537). 1. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-68. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	1. Enter the 'list configuration board UUCSS' command. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later.The error log may have error type 1281 entries. 2. Test all administered trunks on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. 3. If all of the ports fail, check the CARR-POW (see Note below). 4. If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. 5. If the retry passes and troubles have been reported, coordinate isolation with the CO. Make sure that the switch, the CO, and any NTCE equipment (the CSU's) have the correct administration. 6. Replace the circuit pack. **NOTE:** If the conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance Documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance Documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack.

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Table 11-68. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive (see note below). 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted. **NOTE:** Hyperactivity causes some special problems with the sequence suggested above.If the ports are translated after issuing the **list config** command but the 'Vintage' field reports that there is no board (when there really is a board), then the **busyout board** and the **release busy board** commands will not work (even though the **reset board** command will work). The software will put the hyperactive board back in service after the hyperactivity clears.

Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack to assure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of trunk kept in the DS1 Interface circuit pack and in the switch software.

Table 11-69. TEST #36 Port Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. Issue the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a descriptionof this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.

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Table 11-69. TEST #36 Port Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed due to internal system error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test does not run, but returns to PASS. To verify that the trunk is in-service: 1. Enter **status trunk** command to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.

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Table 11-69. TEST #36 Port Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive (see note below). 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted. Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing the **list config** command but the 'Vintage' field reports that there is no board (when there really is a board), then the **busyout board** and the **release busy board** commands will not work (even though the **reset board** command will work). The software will put the hyperactive board back in service after the hyperactivity clears.

DS1 CO Dial Tone Seizure Test (#314)

DS1CO Dial Tone Seizure Test checks the trunk's signaling capability provided by the DS1 Interface circuit pack. The maintenance software initiates the test by sending a "seizure" message to the DS1 Interface circuit pack and expects an "active" reply from the DS1 interface circuit pack. If the "active" message is received, then the test passes. If no message is received and the timer expires, the test is aborted. If the DS1 Interface circuit pack sends a "reorder" message back to maintenance software, then the test fails.

The test **CANNOT** be run on a trunk if one of the following cases is true:

a. The trunk direction is administered as an incoming only trunk.

b. The trunk has been seized by a normal trunk call.

c. The trunk is administered with maintenance test disabled.

Table 11-70. TEST #314 DS1CO Dial Tone Seizure Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-70. TEST #314 DS1CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The test was aborted because the port was seized by a user for a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Test failed due to incompatible configuration administered in trunk group form. 1. Verify the following fields on the trunk group administration screen: Is trunk direction incoming only? Is trunk the port 24 of the DS1 Interface circuit pack while common control channel signaling is specified? Is trunk group type the automatic CO (for example, FX)? 2. If the trunk has been administered using the above information, then this test should abort.
1018	ABORT	Thest is disabled via tranlsation. You may want to determine why the test has been disabled before you enable it. 1. Verify that the 'Maintenance Test' field on the 'Trunk Group' form is set to 'n'. To enable the test, issue the **change trunk-group x** command (x equals the number of the trunk group to be tested). Then, change the entry in the 'Maintenance Test' field on the form to 'y'. 2. Repeat the test.

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Table 11-70. TEST #314 DS1CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The DS1 Interface circuit pack is out-of-service. 1. Look for DS1-BD errors in the Hardware Error Log. If present, refer to DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1040	ABORT	The test was aborted because this port may be an access endpoint. 1. Verify that this port is an access endpoint by issuing the **display port** command. 2. If the port has been administered as an access endpoint, then this is a normal abort.
2000	ABORT	Response to the test request was not received within the allowable time period.
2012	ABORT	The test was aborted due to an internal system error. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-70. TEST #314 DS1CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The trunk cannot be seized for an outgoing call. This could cause in-line failures to be reported against the trunk (no answer would report error type 257 with auxiliary data 57487 in the error log). 1. Verify that the Trunk Type field on the trunk administration screen form matches the trunk type administered on far end switch. 2. Look for DS1-BD/UDS1-BD errors in Hardware Error Log. If present, refer to the appropriate DS1-BD/UDS1-BD (DS1/UDS1 Trunk Circuit Pack) Maintenance documentation. 3. Retry the test at 1-minute intervals for a maximum of 5 times. 4. If the test continues to fail, escalate the problem.
2000	FAIL	Response to the seizure message was not received within the allowable time period. 1. Enter the **list configuration board PCSS** command. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 314 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports will be taken out of service and extraneous on-board alarms will be generated. Replace the circuit pack with a TN767C V3 or later. 2. Verify that the 'Trunk Type' field on the 'Trunk Administration' screen matches the trunk type administered on far-end switch. 3. Look for DS1-BD or UDS1-BD errors in the hardware error log. If present, refer to the DS1-BD (DS1 trunk circuit pack) maintenance documentation or to the UDS1-BD (UDS1 trunk circuit pack) maintenance documentation. 4. Retry the test at 1-minute intervals for a maximum of 5 times. 5. If the test continues to fail, escalate the problem.

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Table 11-70. TEST #314 DS1CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2053	FAIL	At least one of the following errors was found on the DS1 circuit pack: loss of signal (1281), blue alarm (1793), red alarm (2049), yellow alarm (2305), or hyperactivity (1537). 1. Look for these error types in the hardware error log and then follow the procedures given in the maintenance documentation that is appropriate for the error type that was found.
	PASS	The trunk can be seized for an outgoing call.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive (see Note below). 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted. **NOTE:** Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing the **list config** command but the 'Vintage' field reports that there is no board (when there really is a board), then the **busyout board** and the **release busy board** commands will not work (even though the **reset board** command will work). The software will put the hyperactive board back in service after the hyperactivity clears.

CO-TRK (CO Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CO-TRK	MAJOR[2]	test port PCSSpp l	CO Trunk
CO-TRK	MINOR	test port PCSSpp l	CO Trunk
CO-TRK	WARNING	test port PCSSpp l	CO Trunk

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); c is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.).

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

NOTE:
If ATMS testing is enabled, check the error log for ATMS Errors #3840 and #3841. If the error log indicates that measurements exceeded acceptable thresholds, and if no other trouble is found with the **test trunk** command, run the ATMS test call with the **test analog-testcall port UUCCSSpp full** command.

Central Office (CO) trunks are 2-wire analog lines to the CO which support both incoming and outgoing calls. A CO trunk circuit pack provides an interface between the 2-wire analog line from the CO and the system’s (4-wire) Time Division Multiplex (TDM) Bus. The CO Trunk circuit packs include:

- TN747B (United States), 8 port loop start or ground start CO, foreign exchange (FX), or Wide Area Telecommunications (WATS) trunks.
- TN438B (Australia), 8 port loop start.
- TN447 (United Kingdom), 8 port ground start.
- TN465 (multiple countries), 8 port loop start.
- TN2138 (Italy), 8 port loop start.
- TN2147 (multiple countries), 8 port loop start and United Kingdom Earth Calling or Loop Calling Guarded Clearing.

LOOP START AND UK LOOP CALLING GUARDED CLEARING OPERATION

Idle State - Tip _ ground, Ring = CO Battery

A. Outgoing Call

1. PBX Off-Hook (Seize Message): Closes the Tip-Ring Loop
   a. CO Response: DC loop current + Dial tone
2. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
   a. CO Response: CO goes to idle state (see Note)

B. Incoming Call

1. CO Applies Ringing Voltage
   a. PBX Response: Detect ringing current
2. PBX Off-Hook (Answer Message): Close loop
   a. CO Response: Trip ringing, provide loop current
3. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
   a. CO Response: CO goes to idle state (see Note)

NOTE:
Except for the Netherlands Loop Start and UK Loop Calling Guarded Clearing trunks, CO does not normally provide an On-Hook (Disconnect) signal.

GROUND START AND UK EARTH CALLING OPERATION

Idle state - Tip _ open, Ring = CO Battery

A. Outgoing Call

1. PBX Off-Hook(Seize Message): Places ground on Ring
   a. CO Response: Places ground on Tip
   b. PBX Response: close the loop
   c. CO Response: provide loop current
   d. PBX response: dial out digits
2. PBX On-Hook first (Drop Message): Open the Tip-Ring Loop, no loop current
   a. CO Response: Open circuit on Tip
3. CO On-Hook first (Disconnect): Open circuit on Tip, no loop current.
   a. PBX Response: Open Tip-Ring loop

B. Incoming Call

1. CO Off-Hook (Seizure): CO applies ground on Tip, CO applies ringing voltage
   a. PBX Response: Detect ringing, ring destination
2. PBX Off-Hook (Answer Message): Close loop
   a. CO Response: Trip ringing, provide loop current
3. PBX On-Hook first (Drop Message): Open the Tip-Ring Loop, no loop current
   a. CO Response: Open circuit on Tip
4. CO On-Hook first (Disconnect): Open circuit on Tip, no loop current

Hardware Error Log Entries and Test to Clear Values

Table 11-71. CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	57347	None			
15 (b)	any	Port Audit Update Test (#36)			
18	0	busyout trunk <grp>/<mbr>	WARNING	OFF	release trunk <grp>/<mbr>
130(c)		None	WARNING	ON	test trunk <grp>/<mbr>
257 (a)	50176	None			
513 (a)	57364	None	MAJ/MIN/ WRN[2]	ON	
769 (a)	57392	None	MAJ/MIN/ WRN[2]	OFF	
1025 (e)	Any	Demand Diagnostic Test (#3)	MAJ/MIN/ WRN[2]	OFF	test port PCSS sh r 2
1281 (e)	Any	Demand Diagnostic Test (#3)	MAJ/MIN/ WRN[2]	ON	test port PCSS sh r 3
1537		Dial Tone Test (#0)	MAJ/MIN/ WRN[2]	OFF	test port PCSS l r 2
1793		Loop Around and Conference Test (#33)	MAJ/MIN/ WRN[2]	ON	test port PCSS l r 3
2049		NPE Cross Talk Test (#6)	MAJ/MIN/ WRN[2]	ON	test port PCSS l r 3
2561 (d)	57345	None			
2817 (a)	57360	None			
2817 (a)	57393	None			
2817 (d)	57484	Dial Tone Test (#0)	MAJ/MIN/ WRN[2]	OFF	test port PCSS l r 1

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Table 11-71. CO Trunk Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3073 (d)	57376	None			
3329 (d)	57408	None			
3329 (d)	57484	Dial Tone Test (#0)	MAJ/MIN/ WRN[3]	OFF	test port PCSS l r 1
3585 (d)	57424	None			
3840 (f)	8000	Analog Transmission (#844-848)		OFF	
3841 (f)		Analog Transmission (#844-848)	MINOR	OFF	test analog testcall UUCSS pp r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

3 Minor alarms on this MO may be downgraded to warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Notes:

a. These are in-line errors that have no specific test associated with them. Refer to Table 11-72 for an explanation and appropriate action.

b. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. Aux data 57345 -- Single polarity ringing current
Aux data 57376 -- No loop current on incoming call
Aux data 57408 -- No tip ground detected on outgoing call
Aux data 57424 -- No loop current on outgoing call
Aux data 57484 -- No dial tone on outgoing call

These errors cause the Dial Tone Test (#0) to run and are only considered a problem if the Dial Tone Test fails (in which case Error Type 1537 also shows up). In this case, the trunk may be put in "Ready-for-Service" state (shown as "disconnected" by status command), which allows only incoming calls. Run the Dial Tone Test (#0) and follow its outlined procedures.

If error count associated with this error type is very high (that is, 255) and if Alarm Status on the Hardware Error Report is "n" (not alarmed), then the existence of this error type indicates that, despite the fact that many in-line error messages have been received, all Call Seizure Tests have passed. Problems at the CO may cause this condition rather than problems with the PBX.

e. These errors are logged for all versions of the CO-TRK/CO-BD. However, no MINOR alarms are generated for Central Office Trunks [TN747B] with vintages V8 or greater. Any failures received by this test are still logged as Error type 1025/1281 as additional information for the system technician person.

   The system technician person should check for the use of MFT/Range extenders. If there are extenders present, and there are no other complaints or maintenance errors against this trunk, then there is a good chance that Test #3 failed due to excessive loop current and may be ignored.

f. Test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements that were outside the acceptable limits. Use the **list testcall detail** command to examine specific transmission parameters that are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, the limits administered on the "change trunk" screen should be changed.

Table 11-72. CO Trunk Errors with NO Tests

Error Type	Aux Data	Description and System Action	System Technician Action
1	57347	Port error. Ringing without ground. This error is detected on an incoming call on a ground-start CO trunk. The CO trunk circuit pack has not detected a Tip ground before ringing current is detected. This may indicate that the ground detector is not working. However, the call is accepted.	See Note 1 at end of table.
257	50176	Battery reversal detected. This is usually caused by the CO (often seen with step-by-step and cross-bar offices in connection with outgoing calls). This is detected if the direction of the loop current changes from normal to reverse for at least 40 msec. Could occur if the trunk was just installed and for some reason the Tip and Ring wires were reversed at the PBX. If battery reversals occur during dialing, wrong numbers may result. The CO should be asked to remove the battery reversal option.	Refer problem to CO.
513	57364	Ground detector stuck active. After several occurrences, an on-board minor alarm is generated.	Run short test. If test aborts with Error Code 1000, disconnect Tip and Ring and repeat short test. If test still aborts, replace circuit pack. If test passes, refer problem to CO. If any other error code is received, pursue that problem.
769	57392	CO not releasing after call is dropped from PBX end (off-board alarm after several occurrences), or the loop is not open after a disconnect (on-board alarm after several occurrences).	For off-board alarm, refer problem to CO. For on-board alarm, the circuit pack has an on-board problem (for example, stuck relay) and should be replaced.

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Table 11-72. CO Trunk Errors with NO Tests — *Continued*

Error Type	Aux Data	Description and System Action	System Technician Action
2561	57345	Single polarity ringing current. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) Another cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the dial tone test also fails. The last cause could be that certain types of noise are present on the CO line during the silent period of ringing.	Check for other errors first and then see Note 4 at end of table.
2817	57360	Ground but no ringing. This error occurs on an incoming call on a ground-start trunk. If ringing is not detected within 5 seconds of the Tip being grounded, the call is still accepted. If the CO is of the No. 5ESS. switch type, ringing delays of more than 5 seconds during heavy traffic are fairly common.	Check for other errors.
2817	57393	On the TN465, the loop is opening too slowly after a disconnect. This error indicates an on-board problem, although the trunk may be functional. On the TN2138, CO released the trunk at least 4 minutes after the PBX dropped the call. This error code is log-only and causes no other testing to occur. No alarm is generated.	Check for other errors.

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Table 11-72. CO Trunk Errors with NO Tests — *Continued*

Error Type	Aux Data	Description and System Action	System Technician Action
3073	57376	No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the dial tone test and all outgoing calls should also fail.	Check for other errors.
3329	57408	Trunk error. No Tip ground detected on outgoing call. This error occurs when an attempt is made to seize a ground-start CO trunk for an outgoing call and Tip ground is not detected or the caller hangs up before Tip ground is detected.	See Notes 1 and 2 at end of table.
3585	57424	No loop current on outgoing call. This error occurs on attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected.	See Note 3 at end of table.

Notes:

1. At the administration terminal, busyout the affected port, and run a Long Test Sequence. Observe the test results. If any tests fail, refer to the description of the tests and the associated error codes. Release the port. If users continue to report troubles, check for other errors and make test calls to determine whether the problem should be escalated or referred to the CO.
2. At the administration terminal, busyout the affected port, and run a Long Test Sequence. If Dial Tone Test #0 passes, ignore this error. Release the port.
3. At the administration terminal, busyout the affected port, and run a Long Test Sequence. If CO Demand Diagnostic Test #3 passes and this error keeps occurring, refer problems to CO. Release the port.
4. If the error count associated with this error type is very high (that is, 255) and all tests pass, then either the reverse current detector is defective or the CO line is noisy. If the CO line is suspected, Tip and Ring observations should be made. If the line is determined to be noisy, the problem should be referred to the CO. If the reverse current detector is defective, ignore this error.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Dial Tone Test (#0)		X	ND
CO Demand Diagnostic Test (#3) (a)	X	X	ND
Loop Around and Conference Test (#33)		X	ND
Audit Update Test (#36) Analog Transmission Test (#844-848) (b)	X (c)	X (c)	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. A demand test of Diagnostic Test (#3) always returns a PASS indication for CO-TRK/CO-BD [TN747B] version 8 or greater. However, any errors produced as a result of this test are logged and produce no alarms.

   If errors logged by Test #3 are the only complaints against this trunk, then the system technician person should check if MFT/Range Extenders are being used. If extenders are present, then there is a good chance that there is excessive loop current, which causes Test #3 to log errors.

   However, all else being normal, these errors should not affect the customer.

b. Refer to TIE-TRK (Tie Trunk) Maintenance documentation for a description of this test.

c. ATMS test are not part of either sequence. They are run either on demand with the **test analog-testcall** command or via the ATMS schedule.

Dial Tone Test (#0)

This test attempts to seize a port and checks for the return of a dial tone.

Table 11-73. TEST #0 Dial Tone Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the command **display port PCSSpp** to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test were not available. This could be due to a failure to seize the port. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-73. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Trunk has been administered as incoming-only; dial tone can only be obtained on outgoing trunks. This is a normal condition.
1018	ABORT	Test has been disabled via administration. 1. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n". To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."
2000	ABORT	Response to the test was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-73. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Trunk was seized, but dial tone could not be detected. 1. Test all administered outgoing ports on the board. Failure of 1 indicates a problem toward the CO. 2. If all fail, see note below. 3. Check for errors on the TONE-BD or TONE-PT. Clear any errors found, and repeat the test. 4. If the error has still not cleared, refer the problem to the CO. 5. If no service problems exist on the port, continue to use the port until the circuit pack can be replaced (as a last resort). Perform a trunk test call to see if the trunk is operable. **NOTE:** If the dial tone test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation.

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Table 11-73. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2002	FAIL	Seizure portion of test failed due to hardware problem. Fault is usually caused by a disconnected trunk. 1. If the CO Demand Diagnostic Test (#3) also failed, display the Hardware Error Log. If the CO Demand Diagnostic Test failed because it could not detect ground (indicated by Error Type 1281 in the Hardware Error Log) AND Error Type 3329 or 3585 appears in the Hardware Error Log (with the same last occurred time as Error Type 1281 and 1537), replace the circuit pack. 2. Check trunk wiring to ensure good connection; repeat test if wiring correction made. 3. Locate another identical CO trunk and swap its wiring with one under test. Repeat test on both trunks and determine if problem follows trunk or remains at original port. If problem follows trunk, refer problem to CO. If problem remains at port, replace circuit pack and repeat test. 4. If replacing circuit pack does not clear failure, escalate the problem.
1009	PASS	Detected tone was not pure dial tone. [G1, G3iV1.1-286] No action required.
	PASS	Trunk was seized, and dial tone was detected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

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Table 11-73. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

CO Demand Diagnostic Test (#3)

For ground start trunks only, port circuit pack relays are operated and checks are made to see if the port can detect and apply ground on the Tip lead. This test also verifies that there is no external ground on the Ring lead. In the absence of other failures, the circuit pack should be replaced only if this test fails with the CO line disconnected.

For the TN2147 World Class Central Office circuit pack, this test also checks the on-board programmable transmission circuitry that allows the circuit pack to support the transmission characteristics of several countries.

Table 11-74. TEST #3 CO Demand Diagnostic Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-74. TEST #3 CO Demand Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Test inapplicable to present configuration. This is a normal condition.
1018	ABORT	Test has been disabled via administration. 1. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n". To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."
2000	ABORT	Response to the request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-74. TEST #3 CO Demand Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Failure to detect ground or faulty ground detected on Ring lead. Display the hardware errors for this trunk, to determine if the fault was on- or-off board. Look for Error Type 1025 or 1281 (if both appear in the Hardware Error Log, pick the most recent error). Error Type 1025 indicates a faulty ground detected on Ring lead (an off-board fault) and Error Type 1281 indicates failure to detect (internally generated) ground (an on-board fault). Faulty ground detected on Ring lead (Error Type 1025): **NOTE:** On TN747B vintage 8 and greater circuit packs, an incoming seizure during this test may cause it to fail with an off-board fault. 1. Repeat test. If test passes, ignore the original failure. If test aborts, follow the recommended procedures. 2. Repeat test with CO line removed. 3. If test fails, replace the circuit pack. 4. If test passes, refer problem to CO. Failure to detect ground (Error Type 1281): 1. Run the long test sequence. If the CO Demand Diagnostic Test fails, the Dial Tone Test (#0) fails with Error Code 2002, AND Error Type 3329 or 3585 appears in the Hardware Error Log (with the same last occurred time as Error Type 1281 and 1537), replace the circuit pack. 2. Repeat test with CO line removed. 3. If test fails, replace the circuit pack. 4. If test passes, the CO may be drawing too much current. Refer problem to CO.
57481	FAIL	On-board test of programmable transmission circuitry failed. 1. Replace the circuit pack.

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Table 11-74. TEST #3 CO Demand Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	This test verifies that the port is able to apply ground for outgoing calls and detect ground for incoming calls; however, it does not provide information on whether a CO line is actually connected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one way and noisy connections may be observed. This test is usually only part of a port's long test sequence and takes approximately 20 to 30 seconds to complete.

Table 11-75. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the Error Log table for a description of this error and required actions). The port may be locked up. Check the CO wiring, check for excessive loop current, and check the trunk translations. (If the trunk is translated incorrectly, this test will abort.) 2. If the port status is idle, busyout and release the trunk, and then retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test still aborts, replace the circuit pack. 4. If the test continues to abort, escalate the problem.

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Table 11-75. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM-Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-75. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Loop Around and Conference Circuit Test (#33)

This test checks the reflective loop around and conference capabilities of a CO port circuit. The test uses 404-Hz, 1004-Hz, and 2804-Hz tones. Each tone is transmitted separately through the loop and checked.

Table 11-76. TEST #33 Loop Around and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
7	ABORT	Conference Circuit Test aborted.
129	ABORT	The 404-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
131		The 1004-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
133		The 2804-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals a maximum of 5 times. 2. If test continues to abort, escalate the problem.

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Table 11-76. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 769 (see the Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized force. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-76. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	The test was disabled via administration. Verify that the 'Maintenance Test' field on the 'Trunk Group' form is set to 'n'. To enable the test, issue the 'change trunk-group x' command (x equals the number of the trunk group to be tested). Then, change the entry in the 'Maintenance Test' field on the form to 'y'. 1. Retry the command at 1 minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-76. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7,	FAIL	The conference capabilities of the port failed (Error Code 7).
129,		The reflective 404-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 129).
131, or		The reflective 1004-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 131).
133		The reflective 2804-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 133).
		FAULT ISOLATION: Proceed as follows unless power or tone problems are suspected (see notes on the next page).
		1. To make sure the problem is on-board, disconnect the port from the CO and retry the test. Coordinate this with the CO, or do it after busy hours; otherwise, the CO may put the connection out of service.
		2. If the retry fails, replace the circuit pack.
		3. If the retry passes and no troubles have been reported, disable the test. If the retry passes and troubles have been reported, refer the problem to the CO.
		More information continues on the next page.

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Table 11-76. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7, 129, 131, or 133 *(cont'd.)*	FAIL *(cont'd.)*	**NOTE:** If the loop around and conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test. If the test fails again, see FAULT ISOLATION above.
	PASS	CO Trunk Loop Around and Conference Test is successful. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Port Audit Update Test (#36)

This test sends updates of the CO port translation for all ports on the circuit pack that have been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack. No response message is expected from the circuit pack once it receives translation updates. The port translation data includes: ground or loop start trunk, tone or rotary dialing trunk, rotary dialing inter-digit timing, network balance R/RC, and disconnect timing.

Table 11-77. TEST #36 Port Audit Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1006	ABORT	The port has been placed out of service, perhaps by craft busyout. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test were not available. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal system error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to fail, escalate the problem.

Continued on next page

Table 11-77. TEST #36 Port Audit Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	This test passed. Translation information was successfully updated on the circuit pack. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring. If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: 1. Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Transmission Test (#844-848)

This test is non-destructive.

NOTE:
Tests #844-848 are not supported on a International switch.

These tests are run by the Automatic Transmission Measurement System (ATMS). They are not part of the long or short trunk test sequences. Instead, they are run on demand with the **test analog-testcall** command or as part of ATMS scheduled testing.

The test call is run from an analog port on a TN771 Maintenance/Test circuit pack. It attempts to seize a port and make a call to a terminating test line (TTL) on the trunk's far end. Transmission performance measurements are made and compared to administered thresholds. Errors are generated when results fall outside of ''marginal'' or ''unacceptable'' thresholds. Detail and summary measurement reports are obtainable via the **list testcalls** command.

Table 11-78. TEST #844-848 Transmission Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port PCSSpp** to determine the trunk group/member number of the port. Use the "status trunk" command to determine the service state of the port. If the service state indicates that the port is in use, then the port unavailable for this test. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description all possible states). You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.

Continued on next page

Table 11-78. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM bus errors. Refer to TDM Bus Maintenance to diagnose any active TDM bus errors. 1. If system has no TDM bus errors and is not handling heavy traffic, repeat test at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use status trunk to determine when the port is available for testing. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	Trunk has been administered as incoming-only; transmission tests can only be run on outgoing trunks.
1115	ABORT	The near end test line on the TN771 circuit pack could not be allocated. 1. Verify that the TN771 circuit pack is in service and that port 1 is administered and in service with the **status port** command. 2. retry the command at 1 minute intervals for a maximum of 5 retries. 3. If the test continues to abort escalate the problem.
1900	ABORT	The test completion message was not received from the TN771 circuit pack. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.

Continued on next page

Table 11-78. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1901	ABORT	This error occurs when the TN771 circuit pack uplinks a message that is not the proper response for this test. The anticipated uplink messages are seize, ring or answer. 1. Verify that the Trunk is administered properly. 2. If the test continues to abort, escalate the problem.
1905	ABORT	Intercept tone detected from far end. 1. Get the test line data from theand verify it with the far end. Dial the test number manually to see if the TTL is reached. If it is not, then either the number is wrong, or the far end is administered incorrectly. 2. If the test continues to abort escalate the problem.
1906	ABORT	Reorder tone detected from far end. 1. See actions for error code 1905.
1907	ABORT	Other unexpected tone detected from far end. 1. See actions for error code 1905.
1913	ABORT	Audible Ring detected from far end. 1. See actions for error code 1905.
1914	ABORT	Unidentified interrupted tone detected from far end. 1. See actions for error code 1905
1915	ABORT	Busy tone detected from far end. 1. Since the test line at the far end was busy. Try the test again. 2. If the test continues to abort, the problem is with the far end system.
1918	ABORT	Test progress tone not removed from far end (type 105 test line only). 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).

Continued on next page

Table 11-78. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1919	ABORT	Unexpected far end release 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1920	ABORT	No response from far end. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1921	ABORT	No data returned from far end. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1922	ABORT	Steady, unidentifiable tone from far end 1. See actions for error code 1905.
1923	ABORT	Broadband energy detected from far end (such as voice or announcement). 1. See actions for error code 1905.
1924	ABORT	No test tone from far end 1. See actions for error code 1905.
1938	ABORT	Near-end self test failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1939	ABORT	Loss self check at 0dBm at 1004 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1940	ABORT	Far end noise self check failed. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).

Continued on next page

Table 11-78. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1941	ABORT	High frequency singing return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1942	ABORT	Echo return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1943	ABORT	Singing return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1944	ABORT	Loss self check at -16 dBm at 1004 Hz failed. 1. Test the TN771 circuit packs 2. If the test continues to abort escalate the problem.
1945	ABORT	Loss self check at -16 dBm at 404 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1946	ABORT	Loss self check at -16 dBm at 2804 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1947	ABORT	Noise with tone self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
2000	ABORT	The test timed out while waiting for a response from the TN771 circuit pack. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.

Continued on next page

Table 11-78. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	An internal software error occurred. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
2053	ABORT	The test call could not be established, but no information on why is available. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
2056	ABORT	An error occurred while trying to obtain results from the TN771 circuit pack. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group form. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the trunk group form. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
8000	FAIL	Measured transmission performance was in the marginal range as administered on the trunk group form. This generally means that the trunk is usable but has an undesirable amount of noise or loss. If the user does not report unacceptable effects, it may not be necessary to take any action. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the trunk group form.

CONFIG (System Configuration)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
CONFIG	none	none	System Configuration

The System Configuration maintenance object (MO) oversees logical insertion and removal of circuit packs in the system. When Switch Control detects that a circuit pack is present in a port slot, it informs System Configuration and System Configuration queries the circuit pack to determine the type and vintage of the circuit pack. Similarly, when Switch Control detects that a circuit pack has been removed from a port slot, it informs System Configuration.

There are no alarms or tests for System Configuration, but three types of errors are logged to the Hardware Error Log (see below).

Hardware Error Log Entries and Test to Clear Values

System Configuration Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	none
2-117(a)	0-2	none			
257(b)		none			
1002-1117(c)	0-2	none			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates that a Port circuit pack in the system did not respond to a circuit pack type inquiry. Follow the procedures outlined in (b) to determine if there is an error.

b. This error indicates that less than 25% of Trunk Group is available.

c. This error indicates that a Port circuit pack in the system did not respond to a vintage inquiry.

As a result of either of these errors, a Port circuit pack may be physically inserted in a Port slot, but the system may not recognize its existence. The Error Type and Aux Data fields specify the location of the port circuit pack that caused the error as indicated in Table 11-79. If the Error Type field is greater than 1000, subtract 1000 from the Error Type field before consulting the table.

If more than one CONFIG error is logged with an Aux Data of 1 at the same time, investigate any EXP-INTF (Expansion Interface) errors before proceeding.

Once the Port circuit pack location has been determined from Table 11-79, use the **list configuration all** command to determine if the circuit pack is inserted. If not, insert the pack. If the circuit pack has already been inserted but the error persists, replace the circuit pack.

Table 11-79. System Configuration Error Log Entries

Error Type	Aux Data	Port Circuit Pack Location
1	0	GAMUT Circuit Pack[1]
1	1	GAMUT Circuit Pack[2]
2	0	1E01
2	1	2E01
2	2	3E01
3	0	1E02
3	1	2E02
3	2	3E02
4	0	1E03
4	1	2E03
4	2	3E03
5	0	1E04
5	1	2E04
5	2	3E04
6	0	1E05
6	1	2E05
6	2	3E05
7	0	1E06
7	1	2E06

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
7	2	3E06
8	0	1E07
8	1	2E07
8	2	3E07
9	0	1E08
9	1	2E08
9	2	3E08
10	0	1E09
10	1	2E09
10	2	3E09
11	0	1E10
11	1	2E10
11	2	3E10
12	0	1E11
12	1	2E11
12	2	3E11
13	0	1E12
13	1	2E12
13	2	3E12
14	0	1E13
14	1	2E13
14	2	3E13
15	0	1E14
15	1	2E14
15	2	3E14
16	0	1E15
16	1	2E15
16	2	3E15

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
17	0	1E16
17	1	2E16
17	2	3E16
18	0	1E17
18	1	2E17
18	2	3E17
19	0	1E18
19	1	2E18
19	2	3E18
20	0	1E19
20	1	2E19
20	2	3E19
21	0	1E20
21	1	2E20
21	2	3E20
24	0	1B Network Control
25	0	1B Network Control
26	0	1A Network Control
26	1	Maintenance Circuit Pack
27	0	1A Network Control
27	1	2A Tone-Clock
28	0	1A Tone-Clock
28	1	2A01
28	2	3A01
29	0	1A Tone-Clock
29	1	2A02
29	2	3A02
30	0	1A01

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
30	1	2A03
30	2	3A03
31	0	1A02
31	1	2A04
31	2	3A04
32	0	1A2 Processor Interface
33	0	1B2 Processor Interface
34	0	1D01
34	1	2D01
34	2	3D01
35	0	1D02
35	1	2D02
35	2	3D02
36	0	1D03
36	1	2D03
36	2	3D03
37	0	1D04
37	1	2D04
37	2	3D04
38	0	1D05
38	1	2D05
38	2	3D05
39	0	1D06
39	1	2D06
39	2	3D06
40	0	1D07
40	1	2D07
40	2	3D07

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
41	0	1D08
41	1	2D08
41	2	3D08
42	0	1D09
42	1	2D09
42	2	3D09
43	0	1D10
43	1	2D10
43	2	3D10
44	0	1D11
44	1	2D11
44	2	3D11
45	0	1D12
45	1	2D12
45	2	3D12
46	0	1D13
46	1	2D13
46	2	3D13
47	0	1D14
47	1	2D14
47	2	3D14
48	0	1D15
48	1	2D15
48	2	3D15
49	0	1D16
49	1	2D16
49	2	3D16
50	0	1D17

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
50	1	2D17
50	2	3D17
51	0	1D18
51	1	2D18
51	2	3D18
52	0	1D19
52	1	2D19
52	2	3D19
53	0	1D20
53	1	2D20
53	2	3D20
56	0	1A03
56	1	2A05
56	2	3A05
57	0	1A04
57	1	2A06
57	2	3A06
58	0	1A05
58	1	2A07
58	2	3A07
59	0	1A06
59	1	2A08
59	2	3A08
60	0	1A07
60	1	2A09
60	2	3A09
61	0	1A08
61	1	2A10

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
61	2	3A10
62	0	1A09
62	1	2A11
62	2	3A11
63	0	1A10
63	1	2A12
63	2	3A12
66	0	1B01
66	1	2B01
66	2	3B01
67	0	1B02
67	1	2B02
67	2	3B02
68	0	1B03
68	1	2B03
68	2	3B03
69	0	1B04
69	1	2B04
69	2	3B04
70	0	1B05
70	1	2B05
70	2	3B05
71	0	1B06
71	1	2B06
71	2	3B06
72	0	1B07
72	1	2B07
72	2	3B07

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
73	0	1B08
73	1	2B08
73	2	3B08
74	0	1B09
74	1	2B09
74	2	3B09
75	0	1B10
75	1	2B10
75	2	3B10
76	0	1B11
76	1	2B11
76	2	3B11
77	0	1B12
77	1	2B12
77	2	3B12
78	0	1B13
78	1	2B13
78	2	3B13
79	0	1B14
79	1	2B14
79	2	3B14
80	0	1B15
80	1	2B15
80	2	3B15
81	0	1B16
81	1	2B16
81	2	3B16
82	0	1B17

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
82	1	2B17
82	2	3B17
83	0	1B18
83	1	2B18
83	2	3B18
84	0	1B19
84	1	2B19
84	2	3B19
85	0	1B20
85	1	2B20
85	2	3B20
88	1	2A13
88	2	3A13
89	1	2A14
89	2	3A14
90	1	2A15
90	2	3A15
91	1	2A16
91	2	3A16
92	1	2A17
92	2	3A17
93	0	1B Tone-Clock
93	1	2A18
93	2	3A18
94	0	1A1 Processor Interface
94	1	2A19
94	2	3A19
95	0	1B1 Processor Interface

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
98	0	1C01
98	1	2C01
98	2	3C01
99	0	1C02
99	1	2C02
99	2	3C02
100	0	1C03
100	1	2C03
100	2	3C03
101	0	1C04
101	1	2C04
101	2	3C04
102	0	1C05
102	1	2C05
102	2	3C05
103	0	1C06
103	1	2C06
103	2	3C06
104	0	1C07
104	1	2C07
104	2	3C07
105	0	1C08
105	1	2C08
105	2	3C08
106	0	1C09
106	1	2C09
106	2	3C09
107	0	1C10

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
107	1	2C10
107	2	3C10
108	0	1C11
108	1	2C11
108	2	3C11
109	0	1C12
109	1	2C12
109	2	3C12
110	0	1C13
110	1	2C13
110	2	3C13
111	0	1C14
111	1	2C14
111	2	3C14
112	0	1C15
112	1	2C15
112	2	3C15
113	0	1C16
113	1	2C16
113	2	3C16
114	0	1C17
114	1	2C17
114	2	3C17
115	0	1C18
115	1	2C18
115	2	3C18
116	0	1C19
116	1	2C19

Continued on next page

Table 11-79. System Configuration Error Log Entries — *Continued*

Error Type	Aux Data	Port Circuit Pack Location
116	2	3C19
117	0	1C20
117	1	2C20
117	2	3C20
other	-	Unknown Circuit Pack

Continued on next page

1 Development Laboratory only
2 Development Laboratory only

CUST-ALM (Customer-Provided Alarming Device)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
CUST-ALM	none	test customer-alarm PC	Customer-Provided Alarming Device

1 Where PC is an appropriate port network number and carrier (for a High or Critical Reliability system, specify 1a or 1b).

The system provides customers a way to connect their own alarm indication device to a switch. The CUST-ALM maintenance object represents this Customer-Provided Alarming Device (CPAD). When an alarm occurs at least to the level to which the CPAD is administered, the CPAD in the Processor Port Network (PPN) and in the Expansion Port Network (EPN) are activated. The CPAD is administered via the Maintenance-Related System Parameters Form (CPE Alarm Activation Level field). The CPAD is connected to the Maintenance/Tape Processor in the PPN (in a High or Critical Reliability system, the CPAD is connected to both Maintenance/Tape Processors) and to the EPN Maintenance circuit pack in the EPN. The valid levels to which to set the CPE Alarm Activation Level are: *none, warning, minor,* or *major.* The CPAD is also activated within a cabinet whenever Emergency Transfer is invoked within that cabinet. The CUST-ALM MO is not maintained by the system, and does not generate any alarms. If a problem is suspected with the CPAD, it may be tested using the **test customer-alarm** command, which activates the device by closing the relay on either the Maintenance/Tape Processor or the EPN Maintenance circuit pack (whichever is specified) for 1 minute. In a High or Critical Reliability system, the CPAD on the PPN is connected to the Maintenance/Tape Processor on both carrier A and carrier B, and the **test customer-alarm** command can specify which Maintenance/Tape Processor should close its relay. The repeat parameter may be used to close the relay for a longer length of time (5 minutes is the suggested repeat value).

The CPAD is also activated within a cabinet whenever Emergency Transfer is invoked within that cabinet. The CUST-ALM MO is not maintained by the system, and does not generate any alarms. If a problem is suspected with the CPAD, it may be tested using the **test customer-alarm** command, which activates the device by closing the relay on either the Maintenance/Tape Processor or the EPN Maintenance circuit pack (whichever is specified) for 1 minute. In a High or Critical Reliability system, the CPAD on the PPN is connected to the Maintenance/Tape Processor on both carrier A and carrier B, and the **test customer-alarm** command can specify which Maintenance/Tape Processor should close its relay. The repeat parameter may be used to close the relay for a longer length of time (5 minutes is the suggested repeat value).

Hardware Error Log Entries and Test to Clear Values

Customer Provided Alarming Device Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
none	none	none			

System Technician-Demanded Tests: Descriptions and Error Codes

There are no errors associated with the CPAD CUST-ALM MO. The **test customer-alarm PC** command is provided to allow a technician to check that the customer-provided alarming device is correctly installed and functional. It is recommended that this test be run at least once after both the switch and the customer alarm have been installed.

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Customer-Provided Alarming Device Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Customer-Provided Alarming Device Test (#115)	X	X	ND

1 D = Destructive; ND = Nondestructive

Customer-Provided Alarming Device Test (#115)

This test closes the relay that activates the CPAD for 1 minute only within the port network specified. If it takes longer than 1 minute to check that the CPAD has been activated, the Repeat field on the **test customer-alarm PC** command can be used to close the relay for up to 99 minutes. Note that when the repeat option is used, the results for Test #115 come back immediately and, for each test that passed, the CPAD is kept on for that many minutes. The CPAD does not go off after 1 minute and then come back on. Instead, the CPAD is kept on continuously for the entire time. If the CPAD is being activated and deactivated in a flickering fashion, there is a problem with either the CPAD, or the Maintenance/Tape Processor, or the EPN Maintenance circuit pack.

Table 11-80. TEST #115 Customer-Provided Alarming Device Test

Error Code	Test Result	Description/ Recommendation
(blank) 1000 2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The switch software successfully sent the request to the Maintenance/Tape Processor or EPN Maintenance circuit pack to turn on the CPAD. The CPAD must be physically inspected to verify that it is working. If the CPAD is working and the customer has complained that the CPAD did not indicate a system alarm when it occurred, then check the administered levels for turning on the CPAD via the Display System-Parameter Maintenance screen form. Compare these levels with the customer's specifications. If Test #115 passes, and the CPAD is not being activated, check the connection of the CPAD to the Maintenance/Tape Processor or EPN Maintenance circuit pack. If the CPAD can be activated but cannot be deactivated, first check to make sure Emergency Transfer is not activated in the affected port network via the **status system** command. Emergency Transfer can be forced to manual OFF via the Emergency Transfer switch on the Maintenance/Tape Processor or EPN Maintenance circuit pack. If Emergency Transfer is OFF and the CPAD still cannot be deactivated, check the administered levels for the CPAD via the Display System-Parameter Maintenance screen form and compare against the alarm levels currently present in the system (**display alarms** command).

DATA-BD (Network Control Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
DATA-BD	WARNING	test network-control [a | b]	Network Control Circuit Pack
DATA-BD	MINOR	test network-control [a | b]	Network Control Circuit Pack
DATA-BD	WARNING	test network-control [a | b]	Network Control Circuit Pack

The TN777 or TN777B Network Control circuit pack contains the following objects: the SW-CTL (Switch Control), four DATA-CHLs (Network Control Data Channels), the DATA-CON (Network Control Driver), and the generic hardware that interfaces with the TDM Bus (that is, DATA-BD). The generic hardware DATA-BD is described here.

All circuit packs that have an interface with the TDM Bus have a common set of generic hardware that provides the TDM Bus interface. Consequently, these circuit packs share a common set of tests that verify the integrity of the generic hardware. The circuit packs and common set of tests that they share are described in XXX-BD (Common Port Circuit Pack) Maintenance documentation. Because the Network Control circuit pack has this common set of hardware, it is classified in the XXX-BD Maintenance documentation as a service port circuit pack.

A DEFINITY system with a single SPE has a single Network Control circuit pack. A High or Critical Reliability system has two Network Control circuit packs: one that resides in the Active SPE control carrier, and one that resides in the Standby SPE control carrier. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid", and the STBY-SPE (Standby SPE) Maintenance documentation for a description of High and Critical Reliability systems.

Because the Network Control circuit pack is a SPE circuit pack, it has two important characteristics that make maintenance on the DATA-BD MO different from the maintenance on other XXX-BD (Common Port Circuit Pack) MOs. First, because the Network Control circuit pack has the SW-CTL (Switch Control) on it, it must always be physically installed in the system. Therefore, the DATA-BD MO is always logically administered. Second, because the Network Control circuit pack is a SPE circuit pack, it has no PCSS designation. Therefore, the DATA-BD MO **cannot** be accessed by system technician via the **test board PCSS**, **reset board PCSS**, **busyout board PCSS**, or **release board PCSS** commands. The only system technician access to the DATA-BD MO is via the **test network-control [a | b] [short | long]** command.

Hardware Error Log Entries and Test to Clear Values

Network Control Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test data-module <ext> sh r 1
1 (a)	0	Data Channel Reset Test (#107)	MINOR	ON	test data-module <ext> l
23 (b)	0	None	WARNING	OFF	
257	Any	Control Channel Test (#52)	MINOR	ON	test network-control [a | b] sh r 20
257 (c)	0	None			
513 (d)	Any	None			
769 (e)	4358	None			
1025 (f)	4363	NPE Audit Test (#50)			test network-control [a | b] sh
1538 (g)		Data Channel Reset Test (#107)	MINOR	ON	test data-module <ext> l
3840 (h)	Any	None			
3841(i)	Any	None			
3999(j)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates the DATA-BD portion of the Network Control circuit pack stopped functioning. Since the Network Control circuit pack cannot be reset via the **reset board PCSS** command, the Data Channel Reset Test (#107) in the Long Test Sequence for the DATA-CHLs and DATA-CON must be used to reset it as follows:

1. Issue the **list data** command to determine if one, or more, Network Control Data Channels (DATA-CHLs) is administered.

NOTE:
A Network Control Data Channel (DATA-CHL) is identified by a "type" value of "netcon."

2. If a Network Control Data Channel (DATA-CHL) is not administered, use the **add data-module [<ext> | next]** command to administer a DATA-CHL.
3. From the form resulting from the **list data** command, choose a Network Control Data Channel (DATA-CHL) whose port field value indicates that it is on the same carrier (A or B) as the Network Control circuit pack to be reset.
4. Issue the **test data-module <ext> long** command using the extension for the DATA-CHL chosen in Step 3.

WARNING:
Issuing this command drops all data channel extensions. See DATA-CHL (Network Control Data Channel) Maintenance documentation first.

If the red LED stays on, then replace the circuit pack.

b. The circuit pack has been logically administered but not physically installed. The alarm is cleared when the circuit pact is installed.
c. This error indicates transient communications problems with this circuit pack. This error is not service-affecting and no action is required.
d. This error indicates the circuit pack has reported a hardware failure on the circuit pack. The circuit pack should be replaced.
e. This error can be ignored, but look for other errors on this circuit pack.
f. This error is not service-affecting and no action is required.
g. This error indicates the DATA-BD portion of the Network Control circuit pack is out-of-service. Since the Network Control circuit pack cannot be reset via the **reset board PCSS** command, the Data Channel Reset Test (#107) in the Long Test Sequence for the DATA-CHL and DATA-CON must be used to reset it as follows:
   1. Issue the **list data** command to determine if one or more Network Control Data Channels (DATA-CHLs) are administered.

   NOTE:
   A Network Control Data Channel (DATA-CHL) is identified by a "type" value of "netcon."

   2. If a Network Control Data Channel (DATA-CHL) is not administered, use the **add data-module [<ext> | next]** command to administer a DATA-CHL.

3. From the form resulting from the **list data** command, choose a Network Control Data Channel (DATA-CHL) whose port field value indicates that it is on the same carrier (A or B) as the Network Control circuit pack to be reset.

   - Refer to DATA-CHL (Network Control Data Channel) Maintenance documentation before issuing the **test network-control [a | b] long** command to determine if CDR, System Printer, Journal Printer, and/or PMS Links are using the DATA-CHLs and how to busyout these links prior to running destructive tests on the DATA-CHLs.
   - Refer to SW-CTL (Switch Control) Maintenance documentation before issuing the **test network-control [a | b] long** command to determine the consequences of running the Switch Control Reset Test (Test #93).

4. Issue the **test data-module <ext> long** command using the extension for the DATA-CHL chosen in Step 3.

   If the error happens again within 15 minutes, then replace the circuit pack.

h. This error is not service-affecting and no action is required.

i. In a High Critical Reliability system, the vintage number of the TN777B Network Control circuit pack must be greater than or equal to 17. The aux value for error 3841 indicates the vintage of the current TN777B installed.

j. Error type 3999— Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Audit Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Audit Test (#50) (a)		X	ND
Control Channel Loop Around Test (#52)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to DATA-CHL (Network Control Data Channel) and SW-CTL (Switch Control) Maintenance documentation for other tests associated with DATA-BD maintenance.

NPE Audit Test (#50)

The system sends a message to the on-board microprocessor to update the network connectivity information for all the NPEs on the circuit pack.

Table 11-81. TEST #50 NPE Audit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
2100	ABORT	Could not allocate the necessary system resources to run this test.
1019	ABORT	Test already in progress.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The circuit pack’s NPEs have been updated with their translation.

Control Channel Loop Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 11-82. TEST #52 Control Channel Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	Communication with this circuit pack is successful.

DATA-CHL (Network Control Data Channel)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
DATA-CHL[1]	MINOR	test data-module l <ext>	Network Control Data Channel
DATA-CHL[2]	WARNING	test data-module sh <ext>[3]	Network Control Data Channel

1 The **test data-module <ext> long** command drops all sessions on all of the Network Control ports. Refer to Data Channel Reset Test (#107).

2 <ext> is the extension of the Data Channel to be tested. The extension can be determined by issuing the **list data-module** command from the administration terminal. The resulting form provides a mapping from the 1CXXpp designation of the Data Channel to its corresponding extension, where pp indicates which one of the four Data Channels is alarmed (01, 02, 03, or 04) and C indicates the carrier on which the alarmed Data Channel resides (A for carrier A or B for carrier B).

3 The **test data-module <ext> long** command drops all sessions on all of the Network Control ports. Refer to Data Channel Reset Test (#107).

The TN777 or TN777B Network Control circuit pack contains the following objects: the SW-CTL (Switch Control), four Data Channels, the Driver, and the generic hardware that interfaces with the TDM Bus (that is, DATA-BD). The Data Channels are the subject of this section. The Driver is also described.

Together, the four DATA-CHLs and the DATA-CON provide a data communications interface that allows data terminal equipment connected to port circuit packs to communicate with software applications running on the system. The DATA-CON represents the interface to the control channel of the TDM Bus. Each DATA-CHL represents a dial-up/dial-out asynchronous communications port that interfaces to the TDM Bus. The DATA-CON supports the signaling required to establish and tear down a connection between the terminal equipment and a software application. Data is transported between the terminal equipment and the software application over the connection established over the DATA-CHL.

A system with a single SPE has a single Network Control circuit pack (DATA-BD). Thus, there is single set of four DATA-CHLs. A High or Critical Reliability system has two Network Control circuit packs: one that resides in the Active SPE control carrier, and one that resides in the Standby SPE control carrier. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid", and the STBY-SPE (Standby SPE) Maintenance documentation for descriptions of High and Critical Reliability systems.

Network Control Data Channels (DATA-CHLs) may be used to support the following features and functions:

- Establishment of a connection over which to log CDR data to a printer or other storage unit. This connection is called PRI-CDR/SEC-CDR (PRI-CDR Link).
- Establishment of connection(s) over which to log PMS, Automatic Wakeup, and Emergency Access to Attendant data to a Journal printer. This connection is called PMS-PRINT/JRNL-PRNT (PMS Printer Link).
- Establishment of a connection to a customer-owned PMS. This connection is called the PMS-LINK.
- Establishment of a connection to system printer. This connection is called the System Printer Link (SYS-PRNT).
- Establishment of connection(s) for up to two secondary administration terminals.
- Saving announcements from the ANN-BD (Announcement Circuit Pack) to tape.
- Restoring announcements from tape to the ANN-BD (Announcement Circuit Pack).
- Maintenance testing of the DATA-CHLs and DATA-CON.

From the viewpoint of administration, the four DATA-CHLs on a Network Control circuit pack are numbered 01 through 04. In a system with a single SPE or in the Active SPE of a system with High or Critical Reliability, each DATA-CHL may be assigned a unique extension using the **add data-module [<ext> | next]** command. These extensions are called *active* extensions. When assigning an active extension to a DATA-CHL XX (where XX is 01, 02, 03, or 04) the Add Data-Module form also requires the user to assign a unique *maintenance* extension to the corresponding Standby SPE DATA-CHL XX. The maintenance extension is required even when the system does not High or Critical Reliability; that is, even when there are no Standby SPE DATA-CHLs. In a High or Critical Reliability system, a Standby SPE DATA-CHL is tested by using its maintenance extension to identify it.

NOTE:
If a DATA-CHL or the DATA-CON becomes defective on the Network Control in a system with a single SPE, the Network Control circuit pack cannot be replaced without powering down the system.

Figure 11-26 illustrates the logical decomposition of DATA-CHL (Network Control Channel) and the DATA-CON (Network Control Driver) into software and hardware components. The figure also shows the interface to the switch software via the memory bus and to terminal equipment via the TDM Bus and port circuit packs.

As indicated in the figure, DATA-CHLs 1 and 2 share a common Dual Port RAM (DPR) and TDM Bus interface hardware, and DATA-CHLs 3 and 4 share a common DPR and TDM Bus interface hardware. Thus, if DATA-CHL 1 is defective, then DATA-CHL 2 is likely to be defective and vice versa. Similarly, if DATA-CHL 3 is defective, then DATA-CHL 4 is likely to be defective and vice versa.

1. Determine if CDR, System Printer, Journal Printer, and/or PMS Links are using the DATA-CHLs and busyout these links if it is necessary to use the **test network-control [a | b] long** command.
2. Refer to SW-CTL (Switch Control) Maintenance documentation before executing the **test network-control [a | b] long** command to determine the consequences of running the Switch Control Reset Test (Test #93).

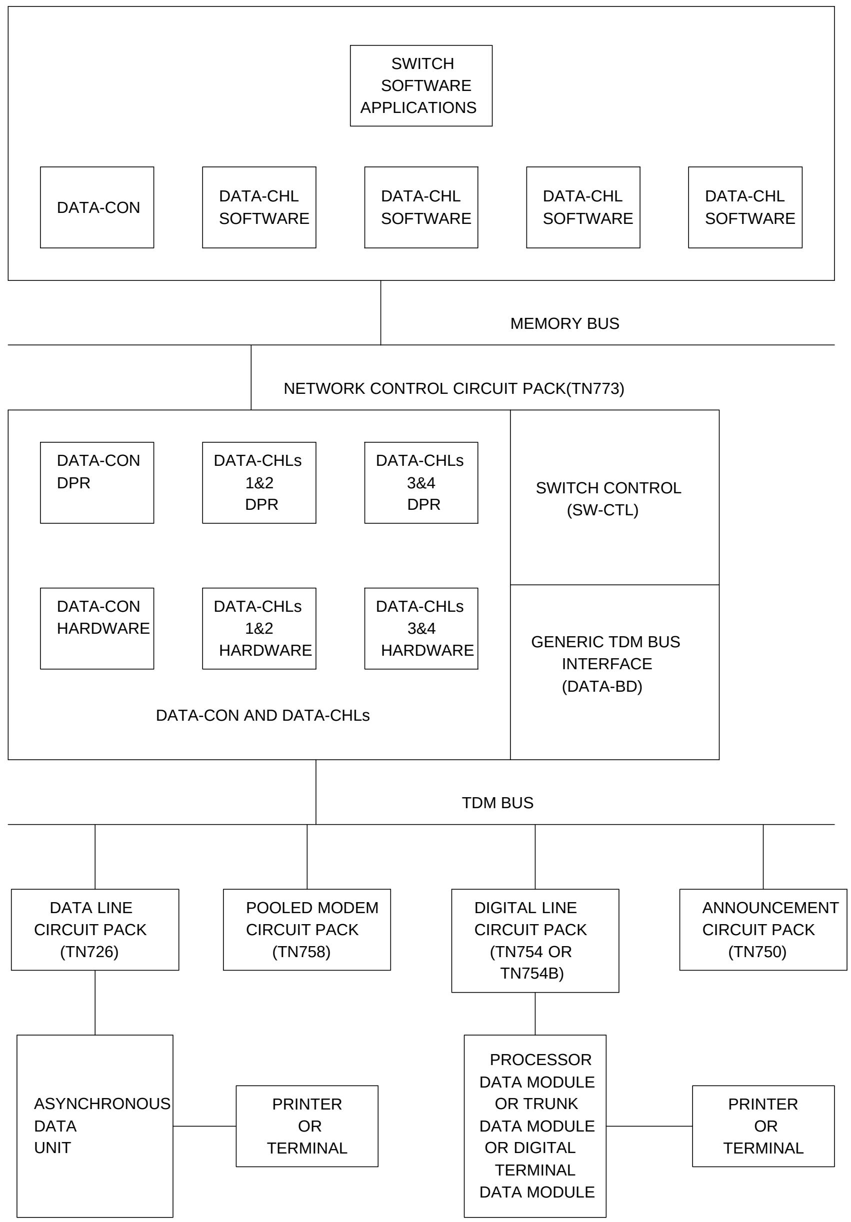

Figure 11-26. DATA-CON (Network Control Driver)

Status of Network Control Data Channels

In order to perform maintenance testing on the Network Control DATA-CHLs, the DATA-CHLs cannot be busy with one of the functions described previously. A series of system technician commands can be used to determine if the DATA-CHLs are busy and, if so, to determine the function for which they are being used. This series of system technician commands is described below and should be done before testing the DATA-CHLs.

Issue the **list data-module** command to determine the extensions for the administered Network Control Data Channels (DATA-CHLs).

NOTE:
A Network Control Data Channel (DATA-CHL) is identified by a "type" value of "netcon."

For each Network Control Data Channel (DATA-CHL) on the Active SPE, determine if the DATA-CHL is busy by issuing the **status data-module <ext>** command using the DATA-CHL's extension. If the DATA-CHL is busy, the Service State field in the resulting form will be in service/active. However, the form does not indicate the reason the DATA-CHL is busy. This must be determined using other system technician commands.

Use the procedures below to determine whether busy Network Control Data Channels (DATA-CHLs) are being used for CDR, Journal Printer, or PMS Links. If a DATA-CHL is busy with one of these links then, in order to test the DATA-CHL, the link must be busied out using **busyout smdr-link**, **busyout journal-printer wakeup-log**, **busyout journal-printer pms-log**, or **busyout pms-link** command, respectively. Do not issue any of these busyout commands unless instructed to do so while investigating Error Codes according to the "System Technician-Demanded Tests: Descriptions and Error Codes" subsection. If one of these links must be busied out to perform maintenance testing, restore the link to service according to PRI-CDR/SEC-CDR (PRI-CDR Link), PMS-PRNT/JNL-PRNT (PMS Printer Link), and PMS-LINK Maintenance documentation, respectively.

If a DATA-CHL is busy but is not being used for one of these links, then it is being used for a secondary administration terminal connection or for maintenance testing. If it is being used for a secondary administration terminal connection, then in order to test the DATA-CHL that the connection is using, the DATA-CHL must be busied out using the **busyout data-module <ext>** command.

NOTE:
The **busyout data-module <ext>** command causes the connection over the associated DATA-CHL to be dropped. Do not issue this command unless instructed to do so.

If the DATA-CHL must be busied out in order to perform maintenance testing, the secondary administration terminal connection must be re-established by redialing the DATA-CHL.

CDR Links

1. Issue the **status smdr-link** command to see if an CDR Link has been established. If the Link State field is "Up," then the CDR Link may be using one of the Network Control Data Channels (DATA-CHLs).
2. Issue the **display system features** command and go to the CDR subsection on Page 2 of the resulting form. Note the values in the Primary Output Extension and Secondary Output Extension fields. If the values are extensions, then the CDR Link is using one of the Network Control Data Channels (DATA-CHLs).
3. For each of the extensions in the Primary Output Extension and Secondary Output Extension fields, issue the **status data-module <ext>** command using the extension. Note the value in the Connected Ports field of the resulting form. If there is a port value in the field, then the indicated port is a Network Control Data Channel (DATA-CHL).
4. Issue the **list data-module** command, locate each port indicated in the Connected Ports fields, and determine if that port has a "type" value of "netcon." If so, then there is an CDR Link over that DATA-CHL.

System Printer Links

1. Issue the **status sp-link** command to see if a System Printer Link has been established. If the Link State field is "Up," then the System Printer Link may be using one of the Network Control Data Channels (DATA-CHLs).
2. Issue the **display system features** command and go to the System Printer subsection on Page 2 of the resulting form. Note the values in the Primary Output Extension and Secondary Output Extension fields. If the values are extensions, then the System Printer Link is using one of the Network Control Data Channels (DATA-CHLs).
3. For each of the extensions in the Primary Output Extension and Secondary Output Extension fields, issue the **status data-module <ext>** command using the extension. Note the value in the Connected Ports field of the resulting form. If there is a port value in the field, then the indicated port is a Network Control Data Channel (DATA-CHL).
4. Issue the **list data-module** command, locate each port indicated in the Connected Ports fields, and determine if that port has a "type" value of "netcon." If so, then there is a System Printer Link over that DATA-CHL.

Journal Printer Links

1. Issue the **status journal-link wakeup-log** and **status journal-link pms-log** commands to see if one or both of these Journal Printer Links have been established. If the Link State field is "Up" for either of these, then that Journal Printer Link may be using one of the Network Control Data Channels (DATA-CHLs).
2. Issue the **display system hospitality** command and note the values in the Extension of Journal/System Printer and Extension of PMS Log Printer fields. If either of these values are extensions, then that Journal Printer Link is using one of the Network Control Data Channels (DATA-CHLs).
3. For each of the extensions in the Extension of Journal/Schedule Printer and Extension of PMS Log Printer fields, issue the **status data-module <ext>** command using the extension. Note the value in the Connected Ports field of the resulting form. If there is a port value in the field, then the indicated port is a Network Control Data Channel (DATA-CHL).
4. Issue the **list data-module** command, locate each port indicated in the Connected Ports fields, and determine if that port has a "type" value of "netcon." If so, then there is a Journal Printer Link over that DATA-CHL.

PMS Link

1. Issue the **status pms-link** command to see if a PMS Link has been established. If the Link State field is "Up," the PMS Link may be using one of the Network Control Data Channels (DATA-CHLs).
2. Issue the **display system hospitality** command and note the value in the Extension of the PMS field. If this value is an extension, the PMS Link is using one of the Network Control Data Channels (DATA-CHLs).
3. For the extension in the Extension of PMS field, issue the **status data-module <ext>** command using the extension. Note the value in the Connected Ports field of the resulting form. If there is a port value in the field, the indicated port is a Network Control Data Channel (DATA-CHL).
4. Issue the **list data-module** command, locate the port indicated in the Connected Ports field, and determine if that port has a "type" value of "netcon." If so, there is a PMS Link over that DATA-CHL.

Hardware Error Log Entries and Test to Clear Values

Network Control Data Channel Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1](a)	0	Any	Any	Any	test data-module <ext> sh r 1
1	Any	Local Loop Back Test (#111)	MINOR	ON	test data-module <ext> sh r 3
18 (b)	0	busyout data-module <ext>	WARNING	OFF	release data-module <ext>
130		None	WARNING	ON	test data-module <ext> sh
257	Any	Remote Maintenance Loop Around Test (#109)	MINOR	ON	test data-module <ext> sh r 5
513	Any	Crosstalk Test (#110)	MINOR	ON	test data-module <ext> sh r 3
769	Any	Dual Port RAM Test (#108)	MINOR	ON	test data-module <ext> l r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

b. In a system with the duplication option, a busyout of the DATA-CHL is preserved across an SPE interchange. When an SPE interchange occurs, and the DATA-CHL is busied out, the busyout state is transferred to the corresponding DATA-CHL on the new active SPE while the DATA-CHL on the former active SPE is released.

System Technician-Demanded Tests: Descriptions and Error Codes

There are two system technician test commands that include the Network Control Data Channels (DATA-CHLs). The **test data-module <ext> [short | long]** command tests the single DATA-CHL that has the extension specified by <ext>.

The **test network-control [a | b] [short | long]** command tests each administered DATA-CHL that resides on the Network Control circuit pack in the specified carrier.

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Data Channel Reset Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Tests for test data-module <ext> Command

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Data Channel Reset Test (#107) (a)		X	D
Data Channel Dual Port Ram Test (#108) (a)		X	D
Data Channel Remote Maintenance Loop Around Test (#109)	X	X	ND
Data Channel Local Loop Back Test (#111)	X	X	ND
Data Channel Crosstalk Test (#110)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Determine if CDR, System Printer, Journal Printer, and/or PMS Links are using the DATA-CHLs and busyout these links if it is necessary to use the **test network-control [a | b] long** command.

Tests for test network-control [a | b] Command

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Test (Common Port Circuit Pack) (#52) (a)		X	ND
NPE Audit Test (Common Port Circuit Pack) (#50) (a)	X	X	ND
Data Channel Reset Test (#107)		X	D
Data Channel DPR Test (#108)		X	D
Data Channel Maintenance Loop Around Test (#109)	X	X	ND
Data Channel Crosstalk Test (#110)	X	X	ND
Data Channel Local Loop Back Test (#111)	X	X	ND
Switch Control Reset Test (#93) (b)		X	D
EPN Maintenance Board Interface Test (#325) (b)		X	D
Time-of-Day Clock Test (#95) (b)	X	X	ND
Control Channel Interface Test (#92) (b)	X	X	ND
Control Channel Transmission Test (#94) (b)	X	X	ND
EPN Maintenance Board Interface Test (#324) (b)	X	X	ND
12 Volt Power Supply Test (#701) (c)	X	X	ND
Memory Card Insertion Test (#695) (c)	X	X	ND
Memory Card Format and Read Test (#696) (c)	X	X	ND
Memory Card Match Test (#697) (c)	X	X	ND
Memory Card Write-Protected Test (#698) (c)	X	X	ND
Memory Card Directory Recovery Test (#699) (c)	X	X	ND
Memory Card Translation Data Integrity Test (#694) (c)		X	ND
Memory Card Erase/Write/Read Test (#693) (c)	X		ND

1 D = Destructive; ND = Nondestructive

a. Refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation for a description of these tests.

b. Refer to SW-CTL (Switch Control) Maintenance documentation for a description of these tests.

c. Refer to the CARD-MEM MO section for information on this test.

Data Channel Reset Test (#107)

This test is destructive.

This test resets the entire data communications interface provided by the DATA-CON and the four DATA-CHLs. It does this by resetting the hardware and software composing the DATA-CON and all four DATA-CHLs. All existing connections over the DATA-CHLs are dropped.

Table 11-83. TEST #107 Data Channel Reset Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2011 2012 2013 2016 2017 2020 2022 2030	ABORT	Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
2100	ABORT	System resources required for this test are unavailable.
	ABORT	An ABORT has one of two different meanings: a. System resources required to run this test are not available. b. Internal System Error.
10704	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-83. TEST #107 Data Channel Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The circuit pack failed to reset. 1. Execute the command again. 2. If the problem persists, replace the TN777 Network Control circuit pack as described in Chapter 5, "Routine Maintenance Procedures". After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. If this is a High or Critical Reliability system, set the Time-of-Day clocks as described in Chapter 8, "Reliability Systems: A Maintenance Aid", to ensure that the clocks on both Network Control circuit packs are synchronized.
	PASS	The circuit pack initializes correctly.

Data Channel Dual Port RAM Test (#108)

This test is destructive.

This is a coordinated test of the dual port RAM that is shared between the hardware and software composing the DATA-CON. Control messages and data are passed through this dual port RAM to establish and tear down connections over the DATA-CHLs. This test requests each side to read and write the dual port RAM, first one at a time and then simultaneously in alternate locations.

This test prevents any control stimuli from being received from or sent to the TDM Bus control channel preventing the establishment of new connections over the DATA-CHLs. However, existing connections are not (and cannot) be dropped.

Table 11-84. TEST #108 Data Channel Dual Port RAM Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2020	ABORT	Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
	FAIL	The DATA-CON dual port RAM is not functioning correctly. Either the software cannot correctly read from it and/or write to it or the hardware cannot correctly read from it and/or write to it. Connections cannot be established over the DATA-CHLs. 1. Execute the command again. 2. If the problem persists, replace the TN777 Network Control circuit pack. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command.
	PASS	The DATA-CON dual port RAM is functioning. Connections can be established over the DATA-CHLs.

Data Channel Remote Maintenance Loop Around Test (#109)

This test verifies the integrity of the entire DATA-CHL (that is, the software, dual port RAM, and hardware that compose it). It verifies that a connection can be established over the DATA-CHL and that the DATA-CHL can correctly send and receive data over the connection (that is, over the TDM Bus). The test actually involves two DATA-CHLs: the DATA-CHL that is the target of the test and a second, arbitrary, unbusy DATA-CHL. A connection is set up by placing a call out from the arbitrary DATA-CHL and into the target DATA-CHL. Data is looped over the connection in each direction (that is, the target DATA-CHL is tested as both a sender of data and a receiver of data). The test checks that the data received by one DATA-CHL is the same as the data that was sent by the other DATA-CHL.

Because it establishes a connection between two Network Control Data Channels (DATA-CHLs) across the TDM Bus, this test does more than just verify the integrity of the target DATA-CHL. It also verifies the integrity of the DATA-CON (by establishing the connection) and of the TDM Bus and Tone-Clock circuit pack (by sending and receiving data).

If this test aborts or fails, it is impossible to determine from this test alone whether the defective DATA-CHL is the target DATA-CHL or the arbitrarily chosen DATA-CHL, or if the problem lies with the DATA-CON, TDM Bus, or Tone-Clock circuit pack. The results of running Tests #107, #108, #110, and #111 on the DATA-CHL can be used to determine whether the target DATA-CHL is defective.

Finally, recall from the description of that DATA-CHLs 1 and 2 share a common Dual Port RAM (DPR) and TDM Bus interface hardware and DATA-CHLs 3 and 4 share a common DPR and TDM Bus interface hardware. Thus, if this test finds that DATA-CHL 1 is defective, then DATA-CHL 2 is likely to be defective and vice versa. Similarly, if this test finds that DATA-CHL 3 is defective, then DATA-CHL 4 is likely to be defective and vice versa.

NOTE:
If an Error Code is encountered recommending that an CDR, System Printer, Journal Printer, and/or PMS Link be busied out, restore each busied out link to service according to PRI-CDR/SEC-CDR (PRI-CDR Link), SYS-PRNT (System Printer Link), JNL-PRNT (Journal Printer Link), or PMS-PRNT/JNL-PRNT (PMS Printer Link) Maintenance documentation, respectively, before concluding work on the problem.

Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test

Error Code	Test Result	Description/ Recommendation
4	ABORT	For this test, an Error Code of 4 can have one of two different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. Internal System Error. Note the results of Tests #110 and #111 in the Short Test Sequence for the target DATA-CHL. If the results of Tests #110 and #111 are both PASS, then there is a high probability that the target DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:** 1. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL.** 2. If the target DATA-CHL is in use for some other function, busyout the function (CDR Link, System Printer Link, Journal Printer Link, PMS Link) or the DATA-CHL (secondary administration terminal connection **only**). 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem. 5. Restore any busied out CDR, System Printer, Journal Printer, or PMS Link to service before moving on to another activity.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
30 31 32 33 40 41 70 75	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	For this test, an Error Code of 1000 can have one of several different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. No other DATA-CHLs are administered and, therefore, not available to place the call to the target DATA-CHL. c. All other DATA-CHLs are busy and, therefore, not available to place the call to the target DATA-CHL. d. System resources required to run this test are not available. e. Internal System Error. Note the results of Tests #110 and #111 in the Short Test Sequence for the target DATA-CHL. If the results of Tests #110 and #111 are both PASS, then there is a high probability that the target DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:** 1. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL.** 2. If the target DATA-CHL is in use for some other function, busyout the function (CDR Link, System Printer Link, Journal Printer Link, PMS Link) or the DATA-CHL (secondary administration terminal connection **only)**.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000 *(cont'd.)*		3. Issue the **list data-module** command to determine if other DATA-CHLs are administered. If no other DATA-CHLs are administered, administer at least one at this time. 4. Determine if the DATA-CHLs OTHER THAN the target DATA-CHL are **all** in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of Network Control Data Channels" section. If so, **and if it is necessary to completely test the target DATA-CHL,** use the following preference guidelines to free **one** of the DATA-CHLs for testing. a. If a DATA-CHL is being used for a secondary administration terminal connection, busyout that DATA-CHL. b. Otherwise, if a DATA-CHL is being used for a PMS Link, busyout the PMS Link. c. Otherwise, if a DATA-CHL is being used for a Journal Printer Link, busyout the Journal Printer Link. d. Otherwise, if a DATA-CHL is being used for an CDR Link, busyout the CDR Link. e. Otherwise, if a DATA-CHL is being used for a System Printer Link, busyout the System Printer Link. 5. Retry the command at one-minute intervals a maximum of five times. 6. If the test continues to abort, escalate the problem. 7. Restore any busied out CDR, System Printer, Journal Printer, or PMS Link to service before moving on to another activity.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006	ABORT	For this test, an Error Code of 1006 can have one of several different meanings: a. No other DATA-CHLs are administered and, therefore, not available to place the call to the target DATA-CHL. b. All other DATA-CHLs are busy and, therefore, not available to place the call to the target DATA-CHL. c. System resources required to run this test are not available. d. Internal System Error. Note the results of Tests #110 and #111 in the Short Test Sequence for the target DATA-CHL. If the results of Tests #110 and #111 are both PASS, then there is a high probability that the target DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:**

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006 *(cont'd.)*		1. Issue the **list data-module** command to determine if other DATA-CHLs are administered. If no other CATA-CHLs are administered, administer at least one at this time. 2. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL.** a. If a DATA-CHL is being used for a secondary administration terminal connection, busyout that DATA-CHL. b. Otherwise, if a DATA-CHL is being used for a PMS Link, busyout the PMS Link. c. Otherwise, if a DATA-CHL is being used for a Journal Printer Link, busyout the Journal Printer Link. d. Otherwise, if a DATA-CHL is being used for an CDR Link, busyout the CDR Link. e. Otherwise, if a DATA-CHL is being used for a System Printer Link, busyout the System Printer Link. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem. 5. Restore any busied out CDR, System Printer, Journal Printer, or PMS Link to service before moving on to another activity.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1016	ABORT	Resources for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	Test disabled via software patch. 1. Escalate to next tier level for instructions on enabling test.
2003	ABORT	Internal System Error.
2004	ABORT	Internal System Error. 1. Check the dial plan to make sure that the extensions of the data channel are set up as local extensions rather than remote or UDP extensions. 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
2011 2012 2013 2016 2017 2020 2022 2051	ABORT	Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 41 2000 2003 2004	FAIL	In the case of Error Codes 40 and 41, the Remote Maintenance Loop Around Test failed because the data received over the connection did not match the data sent over the connection (data was corrupted). In the case of Error Codes 2000, 2003, and 2004, the Remote Maintenance Loop Around Test failed because the data looped over the connection was not received (data was lost). However, because it involves two DATA-CHLs, the test's failure is not sufficient to indict either one of the two DATA-CHLs as defective. 1. Check the dial plan to make sure that the extensions of the data channel are set up as local extensions rather than remote or UDP extensions. 2. Determine which of the DATA-CHLs is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described in the "Status of Network Control Data Channels" section. 3. Note the test results for Tests #110 and #111 in the Short Test Sequence for the target DATA-CHL and refer to Steps 4, 5, and/or 6 to determine the appropriate actions to take based on those results.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 41 2000 2003 2004 *(cont'd.)*		4. If the result of Test #110 is PASS and the result of Test #111 is PASS for the target DATA-CHL, then the most likely problem is that the arbitrarily chosen DATA-CHL is defective. ■ Run the Short Test Sequence for each DATA-CHL that is **not** in use for some other function. Note the test results for Tests #110 and #111 for each of them. ■ If the results of Tests #110 and #111 are both FAIL for at least one of the other DATA-CHLs, investigate the possibility of a defective arbitrarily chosen DATA-CHL. a. Issue the **remove data-module <ext>** for each DATA-CHL for which the results of Tests #110 and #111 were both FAIL to remove the DATA-CHL from operation. b. Repeat the test. c. Replace the Network Control circuit pack at your earliest convenience. Replace the circuit pack as described in Chapter 5, "Routine Maintenance Procedures". After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. ■ If the results of Tests #110 and #111 are not **both** FAIL for any one of the other DATA-CHLs that are not in use for some other function, investigate the possibility of a defective TDM Bus as described in Step 5.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 41 2000 2003 2004 *(cont'd.)*		5. If the result of Test #110 is FAIL and the result of Test #111 is PASS for the target DATA-CHL, then the most likely problem is that the TDM Bus or Tone-Clock circuit pack is defective. ■ Check for the existence of TDM Bus (TDM-BUS) and/or Tone-Clock circuit pack (TONE-BD, TONE-PT, and TDM-CLK) errors and alarms. If they exist: a. Refer to the corresponding Maintenance documentation to clear the errors and alarms. b. Repeat the test. ■ If TDM Bus (TDM-BUS) and/or Tone-Clock circuit pack (TONE-BD, TONE-PT, and TDM-CLK) errors and alarms do not exist, investigate the possibility that the target DATA-CHL, the DATA-CON, or the Network Control circuit pack is defective as described in Step 6.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 41 2000 2003 2004 *(cont'd.)*		6. If the result of Test #110 is either PASS or FAIL and the result of test #111 is FAIL for the target DATA-CHL, then the most likely problem is that the target DATA-CHL is defective, the DATA-CON is defective, or the TN777 Network Control circuit pack is defective. ■ Busyout **all** functions that are using the Network Control Data Channels (DATA-CHLs). **CAUTION:** *All functions must be busied out because Test #107 is destructive and terminates all established connections over the DATA-CHLs.* ■ Issue the **test data-module <ext> long** for the target DATA-CHL. Note the test results for Test #107 and #108. a. If the result of Test #107 is FAIL, then the TN777 Network Control circuit pack is defective. ■ Replace the Network Control circuit pack immediately. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. ■ Repeat the test. b. If the result of Test #107 is PASS and the result of Test #108 is FAIL, then the DATA-CON is defective. ■ Although all DATA-CHLs are unusable, the SW-CTL is still operational. Based on the customer's use of DATA-CHLs, replace the Network Control circuit pack at the customer's convenience. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. ■ Repeat the test.

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Table 11-85. TEST #109 Data Channel Remote Maintenance Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 41 2000 2003 2004 *(cont'd.)*		If the result of Test #107 is PASS and the result of Test #108 is PASS, then the target DATA-CHL is defective. ■ Issue the **remove data-module <ext>** for the target DATA-CHL to remove it from operation. ■ Replace the Network Control circuit pack at your earliest convenience. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. 7. Restore any busied out CDR, Journal Printer, System Printer, or PMS Link to service before moving on to another activity.
	PASS	The target DATA-CHL, DATA-CON, TN777 Network Control circuit pack, TDM Bus (TDM-BUS), and Tone-Clock circuit pack (TONE-BD, TONE-PT, TDM-CLK) are functioning. Connections can be established over the DATA-CHLs.

Data Channel Crosstalk Test (#110)

This test verifies the integrity of the entire DATA-CHL, that is, the software, dual port RAM, and hardware that composes it. However, unlike the Remote Maintenance Loop Around Test (#109), this test only involves the single DATA-CHL that is the target of the test. A loop around connection is established over the TDM Bus from the DATA-CHL back to itself. Data is looped over the connection in each direction, that is, the DATA-CHL is tested as both a sender of data and a receiver of data. The test checks that the data received by the DATA-CHL is the same as the data that was sent by the DATA-CHL.

Because it establishes a loop around connection from the Network Control DATA-CHL back to itself across the TDM Bus, this test does more than just verify the integrity of the target DATA-CHL. It also verifies the integrity of the DATA-CON (by establishing the connection) and of the TDM Bus and Tone-Clock circuit pack (by sending and receiving data).

If this test aborts or fails, it is impossible to determine from this test alone whether the target DATA-CHL is defective or if the problem lies with the DATA-CON, TDM Bus, or Tone-Clock circuit pack. The results of running Tests #107, #108, and #111 on the DATA-CHL can be used to determine whether the target DATA-CHL is defective.

Finally, recall from the description of that DATA-CHLs 1 and 2 share a common DPR and TDM Bus interface hardware and DATA-CHLs 3 and 4 share a common DPR and TDM Bus interface hardware. Thus, if this test finds that DATA-CHL 1 is defective, then DATA-CHL 2 is likely to be defective and vice versa. Similarly, if this test finds that DATA-CHL 3 is defective, then DATA-CHL 4 is likely to be defective and vice versa.

NOTE:
If an Error Code is encountered that recommends that an CDR Link, System Printer Link, PMS Log Printer, Wakeup-Log Printer Link, and/or PMS Link be busied out, restore each busied-out link to service according to the PRI-CDR/SEC-CDR (PRI-CDR Link), SYS-PRNT, or PMS-LINK Maintenance documentation, respectively, before concluding work on the problem.

Table 11-86. TEST #110 Data Channel Crosstalk Test

Error Code	Test Result	Description/ Recommendation
4	ABORT	For this test, an Error Code of 4 can have one of two different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. Internal System Error. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:** 1. If the target DATA-CHL is in use for some other function, busyout the function (CDR Link, System Printer Link, Journal Printer Link, PMS Link) or the DATA-CHL (secondary administration terminal connection **only<EMPH>).** 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem. 4. Restore any busied out CDR, System Printer, Journal Printer, or PMS Link to service before moving on to another activity.
40 70 75	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-86. TEST #110 Data Channel Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	For this test, an Error Code of 1000 can have one of several different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. System resources required to run this test are not available. c. Internal System Error. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:** 1. If the target DATA-CHL is in use for some other function, busyout the function (PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK) or the DATA-CHL (secondary administration terminal connection **only**). 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem. 4. Restore any busied out PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK MOs to service before moving on to another activity.
1002	ABORT	For this test, an Error Code of 1002 can have one of two different meanings: 1. System resources required to run this test are not available. 2. Internal System Error.
1006	ABORT	System resources required to run this test are not available.

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Table 11-86. TEST #110 Data Channel Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1016	ABORT	Resources for the test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	Test disabled via software patch. 1. Escalate to next tier level for instructions on enabling test.
2000	ABORT	Resources for the test are not available.
2003	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2011 2012 2013 2016 2017 2020 2022 2051	ABORT	Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.

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Table 11-86. TEST #110 Data Channel Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
14 16 40 2000 2003 2004	FAIL	In the case of Error Code 40, the Crosstalk Test failed because the data received over the connection did not match the data sent over the connection (data was corrupted). In the case of Error Code 2000, 2003, and 2004, the crosstalk test failed because the data looped over the connection was not received (data was lost). 1. Determine which of the DATA-CHLs are in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of Network Control Data Channels" section. 2. Note the test result for Test #111 in the Short Test Sequence for the target DATA-CHL and refer to Steps 3 and/or 4 to determine the appropriate actions to take based on those results. 3. If the result of Test #111 is PASS, then the most likely problem is that the TDM Bus or Tone-Clock circuit pack is defective. a. Check for the existence of TDM Bus (TDM-BUS) and/or Tone-Clock circuit pack (TONE-BD, TONE-PT, and TDM-CLK) errors and alarms. If they exist: 1. Refer to the corresponding Maintenance documentation to clear the errors and alarms. 2. Repeat the test. b. If TDM Bus (TDM-BUS) and/or Tone-Clock circuit pack (TONE-BD, TONE-PT, and TDM-CLK) errors and alarms do not exist, investigate the possibility that the target DATA-CHL, the DATA-CON, or the Network Control circuit pack is defective as described in Step 4.

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Table 11-86. TEST #110 Data Channel Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
14 16 40 2000 2003 2004 *(cont'd.)*		4. If the result of Test #111 is FAIL, then the most likely problem is that the target DATA-CHL is defective, the DATA-CON is defective, or the TN777 Network Control circuit pack is defective. Busyout **all** functions that are using the Network Control Data Channels (DATA-CHLs). **CAUTION:** *All functions must be busied out because Test #107 is destructive and terminates all established connections over the DATA-CHLs.* a. Issue the **test data-module <ext> long** command for the target DATA-CHL. Note the test results for Tests #107 and #108. 1. If the result of Test #107 is FAIL, then the TN777 Network Control circuit pack is defective. (a).Replace the Network Control circuit pack immediately. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. (b).Repeat the test. 2. If the result of Test #107 is PASS and the result of Test #108 is FAIL, then the DATA-CON is defective. (a).Although all DATA-CHLs are unusable, the SW-CTL is still operational. Based on the customer's use of DATA-CHLs, replace the Network Control circuit pack at the customer's convenience. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. (b).Repeat the test.

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Table 11-86. TEST #110 Data Channel Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
14 16 40 2000 2003 2004 *(cont'd.)*		3. If the result of Test #107 is PASS and the result of Test #108 is PASS, then the target DATA-CHL is defective. (a). Issue the **remove data-module <ext>** command for the target DATA-CHL to remove it from operation. (b). Replace the Network Control circuit pack at your earliest convenience. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. 5. Restore any busied out function (PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK) to service before moving on to another activity.
	PASS	The target DATA-CHL, DATA-CON, TN777 Network Control circuit pack, TDM Bus (TDM-BUS), and Tone-Clock circuit pack (TONE-BD, TONE-PT, TDM-CLK) are functioning. Connections can be established over the target DATA-CHL.

Data Channel Local Loop Back Test (#111)

This test verifies the integrity of the dual port RAM that is shared between the software and hardware that composes the DATA-CHL. The dual port RAM is placed in local loop back mode such that data to be sent by the DATA-CHL is instead looped back to be received by the DATA-CHL. The loop back is done within the dual port RAM, that is, the data is never sent over the TDM Bus. The test checks that the data received by the DATA-CHL is the same as the data that was sent by the DATA-CHL.

This test actually does more than just verify the integrity of the target DATA-CHL. Because it is the DATA-CON that actually puts the Dual Port RAM in local loop back mode and loops the data from the Dual Port RAM back into the Dual Port RAM, the test also verifies the integrity of the DATA-CON.

If this test aborts or fails, it is impossible to determine from this test alone whether the target DATA-CHL is defective or if the problem lies with the DATA-CON. The results of running Tests #107 and #108 on the DATA-CHL can be used to determine whether the target DATA-CHL is defective.

Finally, recall from the description of that DATA-CHLs 1 and 2 share a common Dual Port RAM (DPR) and TDM Bus interface hardware and DATA-CHLs 3 and 4 share a common DPR and TDM Bus interface hardware. Thus, if this test finds that DATA-CHL 1 is defective, then DATA-CHL 2 is likely to be defective and vice versa. Similarly, if this test finds that DATA-CHL 3 is defective, then DATA-CHL 4 is likely to be defective and vice versa.

NOTE:
If an Error Code is encountered that recommends that an CDR Link, System Printer Link, PMS Log Printer, Wakeup-Log Printer, and/or PMS Link be busied out, restore each busied-out link to service according to the PRI-CDR/SEC-CDR (PRI-CDR Link), SYS-PRNT (System Printer Link), PMS-PRNT/JNL-PRNT (PMS Printer Link), or PMS-LINK (Property Management System Link) Maintenance documentation, respectively, before concluding work on the problem.

Table 11-87. TEST #111 Data Channel Local Loop Back Test

Error Code	Test Result	Description/ Recommendation
4	ABORT	For this test, an Error Code of 4 can have one of two different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. Internal System Error. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL.** 1. If the target DATA-CHL is in use for some other function, busyout the function (PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK) or the DATA-CHL (secondary administration terminal connection **only**). 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem. 4. Restore any busied out PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK MOs to service before moving on to another activity.
40 70 75	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-87. TEST #111 Data Channel Local Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	For this test, an Error Code of 1000 can have one of several different meanings: a. The target DATA-CHL is busy and, therefore, not available for use. b. System resources required to run this test are not available. c. Internal System Error. Determine if the target DATA-CHL is in use for some other function (that is, CDR Link, System Printer Link, Journal Printer Link, PMS Link, or secondary administration terminal connection) as described previously in the "Status of network Control Data Channels" section. If so, check for errors on the function that is using the DATA-CHL. If there are no errors, there is a high probability that the DATA-CHL is not defective. Proceed with the remaining steps **only if it is necessary to completely test the target DATA-CHL:** 1. If the target DATA-CHL is in use for some other function, busyout the function (PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK) or the DATA-CHL (secondary administration terminal connection **only**). 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem. 4. Restore any busied out PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK MOs to service before moving on to another activity.

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Table 11-87. TEST #111 Data Channel Local Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006	ABORT	For this test, an Error Code of 1006 can have one of several different meanings: a. System resources required to run this test are not available. b. Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1016	ABORT	Resources for the test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	Test disabled via software patch. 1. Escalate to next tier level for instructions on enabling test.
2000	ABORT	Internal System Error.
2003	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2011 2012 2013 2016 2017 2020 2022 2051	ABORT	Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.

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Table 11-87. TEST #111 Data Channel Local Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 2000 2003 2004	FAIL	In the case of Error Code 40, the Local Loop Back Test failed because the data received over the connection did not match the data sent over the connection (data was corrupted). In the case of Error Code 2000, 2003, and 2004, the Local Loop Back Test failed because the data looped over the connection was not received (data was lost). 1. Determine which of the DATA-CHLs are in use for some other function (that is, PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK or secondary administration terminal connection) as described previously in the "Status of Network Control Data Channels" section.

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Table 11-87. TEST #111 Data Channel Local Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 2000 2003 2004 *(cont'd.)*	FAIL	2. The most likely problem is that the target DATA-CHL is defective or the DATA-CON is defective. Busyout ***all*** functions that are using the Network Control Data Channels (DATA-CHLs). **CAUTION:** *All functions must be busied out because Test #107 is destructive and terminates all established connections over the DATA-CHLs.* 3. Issue the **test data-module <ext> long** command for the target DATA-CHL. Note the test results for Tests #107 and #108. a. If the result of Test #107 is FAIL, then the TN777 Network Control circuit pack is defective. 1. Replace the Network Control circuit pack immediately. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. 2. Repeat the test. b. If the result of Test #107 is PASS and the result of Test #108 is FAIL, then the DATA-CON is defective. 1. Although all DATA-CHLs are unusable, the SW-CTL is still operational. Based on the customer's use of DATA-CHLs, replace the Network Control circuit pack at the customer's convenience. After the Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. 2. Repeat the test.

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Table 11-87. TEST #111 Data Channel Local Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40 2000 2003 2004 *(cont'd.)*	FAIL	c. If the result of Test #107 is PASS and the result of Test #108 is PASS, then the target DATA-CHL is defective. 1. Issue the **remove data-module** command. ■ Replace the Network Control circuit pack at your earliest convenience. After the TN777 Network Control circuit pack has been replaced, its Time-of-Day clock must be set using the **set time** command. 2. Restore any busied out function (PRI-CDR/SEC-CDR, SYS-PRNT, PMS-PRNT/JNL-PRNT, PMS-LINK) to service before moving on to another activity.
	PASS	The target DATA-CHL and DATA-CON are functioning. Connections can be established over the target DATA-CHL.

DATA-CON (Network Control Driver)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
DATA-CON	MINOR	none	Network Control Driver

The TN777 or TN777B Network Control circuit pack contains the following objects: the SW-CTL (Switch Control), four DATA-CHLs (Data Channels), the DATA-CON (Network Control Driver), and the generic hardware that interfaces with the TDM Bus (DATA-BD). The DATA-CON (Network Control Driver) is the subject of this section. The DATA-CHLs (Network Control Channels) are also described.

Together the four DATA-CHLs and the DATA-CON provide a data communications interface that allows data terminal equipment connected to port circuit packs to communicate with software applications running on the system. The DATA-CON represents the interface to the control channel of the TDM Bus. Each DATA-CHL represents a dial-up/dial-out asynchronous communication port that interfaces to the TDM Bus. The DATA-CON supports the signaling required to establish and tear down a connection between the terminal equipment and a software application. Data is transported between the terminal equipment and the software application over the connection established over the DATA-CHL. See Figure 11-27.

A system with a single SPE has a single Network Control circuit pack. Thus, there is a single DATA-CON. A High or Critical Reliability system has two Network Control circuit packs, one in each of the two SPEs. Thus, there is a DATA-CON on the Network Control circuit pack that resides in the Active SPE control carrier and a DATA-CON on the Network Control circuit pack that resides in the Standby SPE control carrier. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid", and the STBY-SPE (Standby SPE) Maintenance documentation for discussions of High and Critical Reliability systems.

From an external (user) point of view, the DATA-CON is not directly accessible via a system technician command; that is, there is no object command word that represents it. Instead, the DATA-CON is tested under the guise of the DATA-CHLs that it controls. The **test data-module <ext> [short | long]** command tests the DATA-CON along with the DATA-CHL designated by <ext> but all Test Results are associated with the DATA-CHL Maintenance Name.

From an internal (system software) point of view, the DATA-CON uses the same set of tests as the DATA-CHLs. Therefore, the DATA-CON assumes the same Error Type and Aux Data values as the DATA-CHLs in the Hardware Error Log. It is also alarmed at the same Alarm Level (that is, MINOR, ON BOARD) in the Alarm Log. In both logs, the Maintenance Name is DATA-CON.

Figure 11-27 illustrates the logical decomposition of DATA-CHLs (Network Control Channels) and the DATA-CON (Network Control Driver) into software and hardware components. It also shows the interface to the switch software via the memory bus and to terminal equipment via the TDM Bus and port circuit packs. As indicated in Figure 11-27, DATA-CHLs 1 and 2 share a common DPR and TDM Bus interface hardware and DATA-CHLs 3 and 4 share a common DPR and TDM Bus interface hardware. Thus, if DATA-CHL 1 is defective, then DATA-CHL 2 is likely to be defective and vice versa. Similarly, if DATA-CHL 3 is defective, then DATA-CHL 4 is likely to be defective and vice versa.

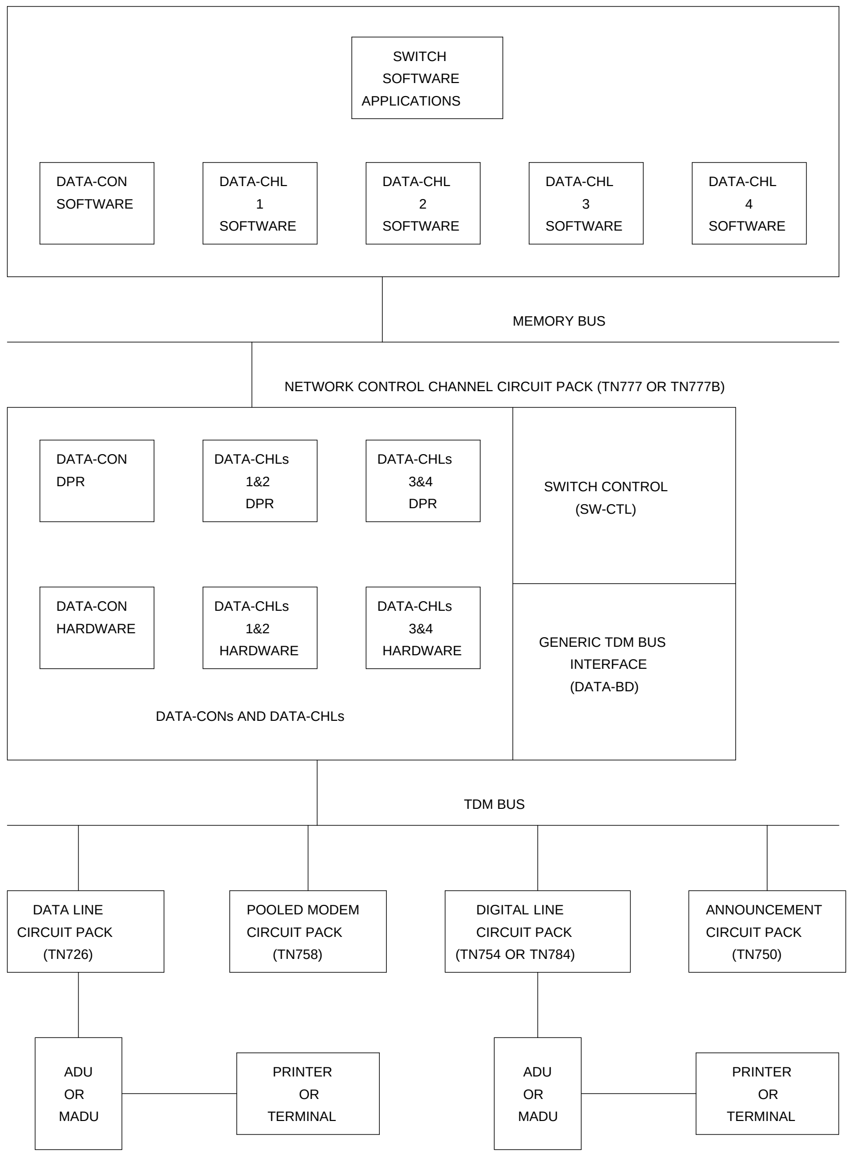

Figure 11-27. DATA-CHL (Network Control Data Channel)

Hardware Error Log Entries and Test to Clear Values

Network Control Driver Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value (a)
0[1]	0	Any	Any	Any	none
1		Local Loop Back Test (#111)	MINOR	ON	none
257	Any	Remote Maintenance Loop Around Test (#109)	MINOR	ON	none
513		Crosstalk Test (#110)	MINOR	ON	none
769	Any	Dual Port RAM Test (#108)	MINOR	ON	none

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. As previously described, the DATA-CON is not directly accessible via a system technician command so there is no Test to Clear value that can be used to directly clear errors and alarms raised against the DATA-CON. However, since the DATA-CON and the DATA-CHLs share the same set of tests (that is, test the same set of hardware, firmware, and software), DATA-CON errors and alarms are accompanied by DATA-CHL errors and alarms.

Therefore, the strategy to clear DATA-CON errors and alarms is to first clear all DATA-CHL errors and alarms. After DATA-CHL errors and alarms have been cleared, allow about 60 minutes for maintenance software to run internally and to automatically clear the DATA-CON errors and alarms.

System Technician-Demanded Tests: Descriptions and Error Codes

Because the DATA-CON uses the same set of tests as the DATA-CHLs, refer to the "System Technician-Demanded Tests: Descriptions and Error Codes" in the DATA-CHL (Network Control Data Channel) Maintenance documentation for a description of the tests and their associated error codes.

DAT-LINE (Data Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DAT-LINE	MINOR	test port PCSSpp l	Data Line
DAT-LINE	WARNING	test port PCSSpp sh	Data Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The TN726 Data Line circuit pack is a port circuit that provides connectivity from the system to asynchronous CPE having RS232-compatible serial interfaces. There are eight data lines (DAT-LINEs) on the Data Line circuit pack. If there are errors associated with the DT-LN-BD (Data Line Circuit Pack), refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation.

Data Lines are administered via the administration terminal **add data-module** command. The data module type is *data-line*. The **list data-module** command lists all administered data modules in the system.

The TN750 Announcement circuit pack has one Data Line on it. The Data Line is used for saving and restoring announcements. For a description of this feature, refer to ANN-BD (Announcement Circuit Pack) Maintenance documentation. Also, if there are errors associated with the Announcement circuit pack, refer to the ANN-BD Maintenance documentation.

NOTE:
If the tests for the Data Line in question pass and there are still user-reported problems, there is probably an external problem. Test the ADU, following the procedures outlined in *User Manual Z3A Asynchronous Data Unit*, 555-401-701. If the ADU appears to be working properly, check the external wiring and, finally, check the customer equipment.

Hardware Error Log Entries and Test to Clear Value

Data Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1		Digital Loop Around Test (#171)	MINOR	ON	test port PCSSpp sh r 2
15(a)	Any	Audit Update Test (#36)			
18	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
130 (b)		None	WARNING	ON	test port PCSSpp sh
257		Conference Circuit Test (#7)	MINOR	ON	test port PCSSpp l r 2
513		NPE Crosstalk Test (#6)	MINOR	ON	test port PCSSpp l r 2
769(a)	Any (c)	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate errors (if any).

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. This error is logged when the Data Line circuit pack finds an error with the transmit/receive circuitry of an administered Data Line on circuit pack insertion. Perform the following procedure:

   1. Issue the **busyout board PCSS** command to busyout the Data Line circuit pack on which this port resides.

   2. Issue the **reset board PCSS** command. Check the Hardware Error Log to determine if Error Type 769 is logged again for the DAT-LINE MO.

      NOTE:
      When displaying errors, set the Active Alarms Only field to "n."

If Error Type 769 reappears, replace the DAT-LINE circuit pack. If Error Type 769 does not reappear, proceed to Step 3.

3. Issue the **release board PCSS** command to release the Data Line circuit pack on which this port resides.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Digital Loop Around Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Loop Around Test (#171)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Audit Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-88. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-88. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use **status data-module** to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an already existing error on this port (Error Type 769). 1. Refer to the procedure for Error Type 769. If Error Type 769 still occurs on this port, replace the circuit pack.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-88. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests, examining the ADU, external wiring, and customer equipment.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-89. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use **status data-module** to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an already existing error on this port (Error Type 769). 1. Refer to the procedure for Error Type 769. If Error Type 769 still occurs on this port, replace the circuit pack.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 11-89. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The conference circuit test failed (possible off-board problem). 1. Busyout and release the port (data line), and then retest. 2. Replace the circuit pack if the test continues to fail.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests, examining the ADU, external wiring, and customer equipment.

Audit Update Test (#36)

This audit makes sure that the hardware state of the Data Line is consistent with the system translations. When this audit is run, the port is queried for the switchhook state, and the software state is updated according to the returned value. Also, the data line options are sent down to the port.

Table 11-90. TEST #36 Audit Update Test

Error Code	Test Result	Description/ Recommendation
1006	ABORT	The test did not run due to an already existing error on this port (Error Type 769). 1. Refer to the procedure for Error Type 769. If Error Type 769 still occurs on this port, replace the circuit pack.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal System Error.
7	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The hardware port state is consistent with the software state. User-reported troubles on this port should be investigated using other port tests, examining the ADU, external wiring, and customer equipment.

Digital Loop Around Test (#171)

The Digital Loop Around Test checks the Data Line's ability to transmit and receive data on the TDM Bus. Data is sent through Network Control Data Channel 3 (data channel port 3) over the TDM Bus, internally looped through the Data Line back onto the TDM Bus, and received again by Network Control Data Channel 3.

If data channel 3 is in use or not administered, this test aborts. This test may fail if Network Control Data Channel 3 is not functioning properly. If there are any DATA-CHL errors in the Error Log, refer to the DATA-BD (Network Control Circuit Pack) Maintenance documentation to clear them up first. This test passes regardless of any customer equipment that may be connected to the port, as long as the port is not in use by the equipment.

Table 11-91. TEST #171 Digital Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005 1007	ABORT	Network Control Data Channel 3 is not administered. This port is required to run this test. 1. Verify that data channel 3 is not administered with the **list data-module** command. Administer data channel 3 with the **add data-module** command, and run this test again. 2. If data channel 3 is administered and the test continues to abort, escalate the problem.

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Table 11-91. TEST #171 Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1016	ABORT	Network Control Data Channel 3 is busy. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an already existing error on this port (Error Type 769). 1. Reseat the circuit pack and look in the Error Log. If Error Type 769 still occurs on this port, replace the circuit pack.
2003	ABORT	Failed to receive an off-hook from the Data Line. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test still aborts, replace the circuit pack.
2004	ABORT	Failed to receive an off-hook from the Network Control Data Channel.
2005	ABORT	The handshake between the data channel and the data line port failed. 1. Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation. 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test still aborts, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-91. TEST #171 Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The test failed because the data received did not match the data sent. This would indicate that there is a fault somewhere in the transmit/receive path to the TDM Bus, which probably results in data corruption over this port. This test may fail if Network Control Data Channel 3 is not functioning properly. 1. Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation. 2. Repeat this test. 3. If the test fails again, replace the Data Line circuit pack.
2000	FAIL	The test failed waiting for the transmitted data to be looped back. 1. Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation. 2. Repeat this test. 3. If the test fails again, replace the Data Line circuit pack.
	PASS	The port can correctly transmit/receive data. User-reported troubles on this port should be investigated by examining the ADU, external wiring, and customer equipment.

DC-POWER (Single-Carrier Cabinet Power)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DC-POWER	MAJOR	test environment P	Single-Carrier Cabinet Power

1 Where P is an appropriate port network number determined from the PORT field of the alarm log.

DEFINITY offers two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, the High or Critical Reliability system, PPN, or EPN cabinet configuration aspects are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate MO section(s).

- For a single-carrier cabinet system, refer to the DC-POWER (DC Power) Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following MO Maintenance documentation sections: AC-POWER (AC Power) for AC-Powered Systems, CARR-POW (Carrier Port Power Unit) for AC-Powered Systems, or POWER (Battery & Battery Charger) for AC-Powered Systems.
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following MO Maintenance documentation sections: AC-POWER (AC Power) for DC-Powered Systems, CARR-POW (Carrier Port Power Unit) for DC-Powered Systems, or POWER (Battery & Battery Charger) for DC-Powered Systems.

The DC-POWER MO represents all the environmental maintenance for a single-carrier cabinet system. It includes an external power unit and all the Carrier Port Power Units in the Port Network. The external power unit can be either a DC or an AC power source. If the external power unit is AC, then the Carrier Port Power Units must be WP-91153 power units. If the external power unit is DC, then the Carrier Port Power Units must be 676B power units. If the hardware detects a problem with any one of these elements, it reports the information to the system software through a single lead. The system software cannot differentiate between different environmental failures. All environmental alarms on a single-carrier cabinet system are logged as a major DC-POWER alarm. Therefore, it is possible to get a DC-POWER alarm when there is still power to the system. The Carrier Port Power Unit has one LED: the yellow LED on means operating as normal and the LED off means no external power being supplied or that the power unit has a fault.

NOTE:
Physically removing a Carrier Port Power Unit from a carrier in a single-carrier cabinet system does not raise a DC-POWER alarm. The removal of the power unit is equivalent to the carrier being physically absent since DC-POWER maintenance cannot distinguish between these two situations.

A single-carrier cabinet system powered by an AC external power source with WP-91153 Carrier Port Power Units has a minimal Nominal Power Holdover (NPH) for the PPN only in Standard, High, and Critical Reliability systems. There is no NPH for a DC- powered single-carrier cabinet PPN or for an AC- or DC-powered single-carrier cabinet EPN system. For a complete description of NPH, refer to the AC-POWER (AC Power) Maintenance documentation. NPH in the PPN of an AC-powered single-carrier cabinet system without High or Critical Reliability provides full powering for .25 seconds, and power to the control complex for an additional two minutes.

Hardware Error Log Entries and Test to Clear Values

Single-Carrier Cabinet Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
513	0	Single-Carrier Cabinet	MAJOR	ON	test environment P r 2
		Power Query Test (#79)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Single-Carrier Cabinet Power Query Test*, for example, you may also clear errors generated from other tests in the testing sequence. Test description(s) and recommended maintenance procedures follow for all errors that can occur during system technician-demanded testing.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Single-Carrier Cabinet Power Query Test (#79)	X	X	ND
Emergency Transfer Query Test (#124) (a)	X	X	ND
External Alarm Lead Query Test (#120) (b)	X	X	ND
Analog Ring Generator Initialization Test (#117) (c)	X	X	ND
Analog Ring Generator Query Test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

b. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

c. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test.

NOTE:
Tests #117 and #118 only show up in the test sequence if there is a TN768 Tone-Clock circuit pack in the port network being tested.

Single-Carrier Cabinet Power Query Test (#79)

This test queries the Maintenance/Tape Processor (in a PPN) or the EPN Maintenance circuit pack (in an EPN) about the status of the power in a single-carrier cabinet system. This test can only detect power problems in carriers in the Port Network for which the Carrier Port Power Unit is physically present.

Table 11-92. TEST #79 Single-Carrier Cabinet Power Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Then, repeat the test.If the test continues to ABORT with a 2000 Error Code, check for and resolve all DUPINT (Duplication Interface Circuit Pack) errors in a PPN for a High or Critical Reliability system, PR-MAINT (Maintenance/Tape Processor) errors in a Standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 3. If the test continues to ABORT with a 2000 Error Code, then escalate the problem.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-92. TEST #79 Single-Carrier Cabinet Power Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	There is currently a problem with the environment of the power system. 1. The power unit for any one of the carriers may have been lost. a. Verify and, if necessary, restore AC or DC power units for each carrier. b. Rerun the test. If the test still fails, proceed to Step 2. 2. Either the WP-91153 AC power unit or the 676B DC power unit for one of the carriers could be defective. Refer to the "Removing Power" and "Restoring Power" sections in Chapter 5, "Routine Maintenance Procedures", for instructions on replacing the power unit. a. If the WP-91153 AC power unit or the 676B DC power unit does not have its yellow status LED on, then replace the power unit. b. If the Active Tone-Clock circuit pack loses power, the system performs a Cold-2 restart to finish (the login prompt appears at the administration terminal). c. Rerun the test. If the test still fails, proceed with Step 3. 3. The PR-MAINT (Maintenance/Tape Processor), the DUPINT (Duplication Interface Circuit Pack), or the MAINT (EPN Maintenance Circuit Pack) could be incorrectly reporting this error. Resolve all alarms on these MOs, and rerun the test. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that **are not** detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, follow normal escalation procedures.
	PASS	The PR-MAINT (Maintenance/Tape Processor), the DUPINT (Duplication Interface Circuit Pack), or the MAINT (EPN Maintenance Circuit Pack) has reported no problem with the power.

DETR-BD

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DETR-BD	MINOR	test board PCSS	Tone Detector Circuit Pack
DETR-BD	WARNING	test board PCSS	Tone Detector Circuit Pack

1 Where P is the port network number (1 for PPN, 2 for EPN, and 3 for EPN2); C is the carrier number (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

G1, G3iV1.1-286, and those G3iV2-386 systems that use the Mu-law companding mode use TN748 Tone Detector circuit packs or TN756 combination Tone Detector-Tone-Clock circuit packs. G3iV2-386 systems that use the A-Law companding mode use TN420B (and higher suffixes) Tone Detector circuit packs. The companding mode of the DETR-BD circuit pack must match that administered for the system for proper tone detection. The companding mode is administered on the System-Parameters Country-Options form. Refer to *DEFINITY Communications System Generic 3 Implementation*, 555-230-653.

For all DETR-BD circuit pack level errors, refer to XXX-BD (Common Port Board) Maintenance documentation.

DID-BD (Direct Inward Dial Trunk Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DID-BD	MIN	test board PCSS sh	Direct Inward Dial Trunk Circuit Pack
DID-BD	WRN	test board PCSS sh	Direct Inward Dial Trunk Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or; C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also DID-TRK (DID Trunk) Maintenance documentation for related trunk information.

DID-DS1 (DS1 DID Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
DID-DS1	MAJOR[1]	test trunk <grp>/<mbr> l	Direct Inward Dial Trunk
DID-DS1	MINOR	test trunk <grp>/<mbr> l	Direct Inward Dial Trunk
DID-DS1	WARNING	test trunk <grp>/<mbr>	Direct Inward Dial Trunk

1 A major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

The DID-DS1 trunk provides a digital DID trunk from a CO switch into the system through a DS1 link. A 24 channel DS1 link can support up to 24 DID-DS1 trunk calls simultaneously. A 32 channel DS1 link [G3iV2-386] can support up to 30 DID-DS1 trunk calls simultaneously. A DID-DS1 trunk can be used for both voice and data communications with appropriate DS1 signaling mode (for example, common channel signaling). Only the TN767 and TN464 [G3iV2-386] DS1 Interface circuit packs support the DID-DS1 trunk call processing signalings, wink-start, and immediate-start.

DID-DS1 trunk maintenance provides a means to maintain a DID trunk on a port of DS1 Interface circuit pack. Information included covers the in-line errors log, initialization tests, periodic tests, system technician demand tests, and alarms escalation and elimination. Two trunk service states are specified in the DID-DS1 trunk maintenance. They are: *out-of-service*, the trunk is in a deactivated state and can't be used for incoming calls; *in-service*, the trunk is in an activated state and can be used for incoming calls. If the DS1 Interface circuit pack is out-of-service, then all trunks on the DS1 Interface circuit pack are put into out-of-service state and a Warning alarm is raised.

Hardware Error Log Entries and Test to Clear Values

Direct Inward Dial Trunk Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test trunk <grp>/<mbr> sh r 1
1 (a)	Any				
15 (b)	Any	Port Audit and Update Test (#36)			
18 (c)			WARNING	OFF	release trunk <grp>/mbr>
130 (d)		None	WARNING	ON	test trunk <grp>/<mbr>
257 (e)	57474 57473				
513 (f)	57392	None	MIN/MAJ[2]	OFF	
769 (g)	57393	None	MIN/MAJ[3]	OFF	
1281		Conference Circuit Test (#7)	MAJ/MIN/ WRN[4]	ON	test trunk <grp>/<mbr> l
1537		NPE Crosstalk Test (#6)	MAJ/MIN/ WRN[5]	ON	test trunk <grp>/<mbr> l
1793 (h)				ON	test board PCSS l
2305(i)	50944	None	MIN/MAJ[6]	OFF	
3840 (j)		Port Audit and Update Test (#36)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

4 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

5 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

6 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

Notes:

a. DS1 Interface circuit pack detects a hardware error. The Aux Data field contains the Error Type: 57476, on-hook before wink; 57477, on-hook before ready to receive digits; 57485, wink too short for valid signal. Escalate the error.

b. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate errors (if any).

c. System Technician has busied out the trunk to out-of-service state. No calls can be made on this trunk.

d. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. DS1 Interface circuit pack detects a hardware error. The Aux Data field contains the Error Type: 57474, rotary dial rate above 12 pulses per second; 57473, rotary dial rate below eight pulses per second. Escalate the error.

f. DS1 Interface circuit pack detects a hardware error. The Aux Data field contains the Error Type: 57392, no external release on PBX disconnect. Escalate the error.

g. DS1 Interface circuit pack detects a hardware error. The Aux Data field contains the Error Type: 57393, belated external release on PBX disconnect. Escalate the error.

h. DS1 Interface circuit pack is out-of-service. Look for DS1-BD errors in Hardware Error Log. Refer to the DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation for details.

i. Error Type 2305—This error indicates that a signaling change was detected by the PBX trunk circuit pack which is inconsistent with the present state of the trunk.

j. Port Audit and Update Test (#36) failed due to an internal system error. Enter **status trunk** command to verify the status of the trunk. If the trunk is out-of-service, then enter the **release trunk** command to put it back to in-service. Retry the test command. If the test continues to abort, then escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence..

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit and Update Test (#36)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-93. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-93. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM BUS error. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM Bus errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-93. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: 1281—Loss of signal, 1793—Blue Alarm, 2049—Red Alarm, 2305—Yellow Alarm, 1537—Hyperactivity. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-93. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	The test failed. This can be due to on-board or off-board problems. Off-board problems of concern include EXP-PN and EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-PN and/or EXP-INTF errors in the error log. If present, refer to the EXP-PN and the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD and the TONE-PT Maintenance documentation. 4. Retest when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Table 11-93. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **llst config** command and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passed.

Table 11-94. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-94. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. Refer to the TDM-BUS (TDM bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. 1. Look for TTR-LEV errors in the error log. If present, refer to the TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at 1 minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Issue the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-94. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	The test was disabled via translation. You may want to determine why the test has been disabled before you enable it. 1. Verify that the 'Maintenance Test' field on the 'Trunk Administration' screen is set to 'n'. To enable the test, change the trunk administration and enter 'y' into the 'Maintenance Test' field. 2. Repeat the test.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: 1281—Loss of signal, 1793—Blue Alarm, 2049—Red Alarm, 2305—Yellow Alarm, 1537—Hyperactivity. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-94. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. 1. Enter the **list configuration board UUCSS** command. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281. 2. Test all administered trunks on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. 3. If all of the ports fail, check the CARR-POW (see note below). 4. If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. 5. If the retry passes and troubles have been reported, coordinate isolation with the CO. Make sure that the switch, the CO, and any NTCE equipment (the CSUs) have the correct administration. 6. Replace the circuit pack. **NOTE:** If the conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the 'CARR-POW (carrier port power unit for AC-powered systems) Maintenance Documentation'. To investigate problems with a 645B DC power unit, refer to the 'CARR-POW (carrier port power unit for DC-powered systems) Maintenance Documentation'. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack.

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Table 11-94. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring. **NOTE:** This test always passes for TN712 Analog circuit packs prior to Vintage 14 and for TN742 prior to Vintage 4.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

Port Audit and Update Test (#36)

This test sends port level translation data from the switch processor to the DS1 Interface circuit pack to assure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of the trunk as kept in the DS1 Interface circuit pack and in the switch software.

Table 11-95. TEST #36 Port Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The port may be busy with a valid call. Issue the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1006	ABORT	The test was aborted because the trunk is out of service. 1. Use the **status trunk** command to verify that the trunk is out of service. 2. If the trunk is out of service, determine why. 3. If it is OK to put the trunk back in service, issue the **release trunk** command to put the trunk back in service, and then retry the test. 4. If the test continues to abort, escalate the problem.

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Table 11-95. TEST #36 Port Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate resources to run this test. 1. Retry the command at 1 minute intervals for a maximum of 5 times. If the test continues to abort, escalate the problem
	FAIL	Test failed due to Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: 1. Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.

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Table 11-95. TEST #36 Port Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

DID-TRK (DID Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DID-TRK	MAJOR[2]	test port PCSSpp l	DID Trunk
DID-TRK	MINOR	test port PCSSpp l	DID Trunk
DID-TRK	WARNING	test port PCSSpp l	DID Trunk

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

Direct Inward Dial (DID) trunks, coming from the Central Office (CO), allow outside parties to call directly to an extension in the system. DID Trunk circuit packs include:

TN753 [G1, G3iV1.1-286, G3iV2-386]	United States
TN2146 [G3iV2-386]	Belgium and the Netherlands
TN2139 [G3iV2-386]	Italy
TN 436 [G3iV2-386]	Australia
TN459 [G3iV2-386]	United Kingdom

The DID Trunk circuit packs support eight, incoming-only, ports. Each port provides an interface between the 2-wire analog line from the CO and the DEFINITY system. The DID port receives 3 to 5 digits from the CO that is used to directly connect an outside caller to the called station without assistance from an attendant. See Figure 11-28.

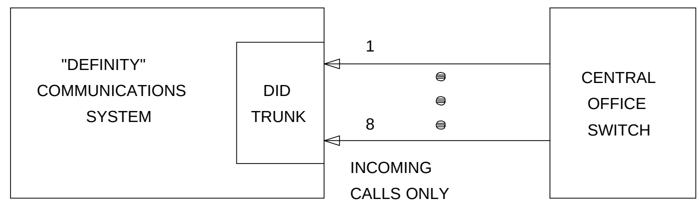

Figure 11-28. DID Trunk Interactions

For each call, the CO switch signals the system by opening and closing individual DID loops (one of the eight ports) and causing the starting or stopping of loop current.

A DID trunk operation involves three significant aspects:

1. Transmission—deals with the interface requirements regarding all AC signals. Transmission includes gain, analog to digital encoding, and digital to analog decoding.
2. Signaling—involves interpretation of DC signals appearing on Tip and Ring to and from the CO. These signals include off-hook, on-hook, and dial pulse detection.
3. Switch Connection—involves the connection between the trunk circuitry and the TDM Bus of the system. It operates the switchhook connection to the TDM Bus.

Four tests are implemented to diagnose the health of a DID trunk. All of them test on-board circuitry only. They are:

1. Loop Around and Conference Circuit Test—verifies the transmission operation of the circuit pack (loop around within the port), and checks the conference capabilities of all ports.

   This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from trunk administration Test field. (This also disables the port diagnostic test).
2. NPE Crosstalk Test—verifies the switch connection operation of the circuit pack. The test also verifies that the trunk circuitry only talks on the selected time slot on the TDM Bus and never crosses over to time slots reserved for other connections.

3. Port Diagnostic Test—the battery feed circuitry is tested for hook detection.
4. Port Audit Update Test—updates the DID translation information on individual ports of the DID trunk. The port translation data consists of signaling parameters whose values depend on the CO switch connected to the trunk. These parameters include:
   - wink (signal indicating PBX is ready to receive digits) or immediate start
   - dial tone or rotary dialing trunk
   - rotary dialing inter-digit timing
   - network balance R/RC
   - disconnect timing

Additional in-line testing is performed while a call is in progress. Thus, in-line errors may occur during operation. See Error Log table for a description of these errors. These errors may be reproduced by using the trunk (that is, placing a call) and checking their occurrence in the Hardware Error Log.

Problems detected during signaling may be caused by faults off-board (in the CO switch or connections) for which a Warning alarm is raised.

Before a maintenance test can be run on a port, the port must be idle. If an incoming call seizes the port which is being tested by maintenance, the test is aborted, and the incoming call proceeds.

For transmission and signaling standard specification, refer to Digital PBX Standards document RS4648.

Hardware Error Log Entries and Test to Clear Values

DID Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	Any	None	WRN	OFF	
1 (b)	57476	None	WRN	OFF	
1 (c)	57477	None	WRN	OFF	
1 (d)	57483	None	WRN	OFF	
15 (e)	Any	Port Audit Update (#36)			
18	0	busyout trunk <grp/mbr>	WRN	OFF	release trunk <grp/mbr>
130 (f)		None	WRN	ON	test trunk <grp>/<mbr>
257 (g)	57472	None	WRN	OFF	
257 (h)	57473	None	WRN	OFF	
257 (i)	57474	None	WRN	OFF	
257 (j)	57475	None	WRN	OFF	
513 (k)	57392	None	MAJ/MIN/ WRN[2]	OFF	
510 (l)	57393	None			
769	Any	Port Diagnostic (#35)	MAJ/MIN/ WRN[3]	ON	test port PCSSpp r 3
1025		Loop Around and Conference (#33)	MAJ/MIN/ WRN[4]	ON	test port PCSSpp r 3
1281		NPE Crosstalk (#6)	MAJ/MIN/ WRN[5]	ON	test port PCSSpp r 3
1537	Any	Port Diagnostic (#35)	MAJ/MIN/ WRN[6]	OFF	test port PCSSpp r 3
1793 (m)	57489	None	None		

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

3 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

4 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

5 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

6 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Notes:

A common trouble on DID trunks, which reports no errors or alarms, occurs when the CO busies out the port (disconnects port). This situation occurs when the CO thinks there are problems with the DID port. In this case, no incoming calls are possible through this port. In addition to complaints received from outside callers trying unsuccessfully to call in, this problem can be diagnosed by listing measurements on lightly used trunks. If a particular port is detected as not in use, a call to the CO is necessary to get the connection back in service.

a. This condition occurs when the tone detector times out waiting for digits.

   1 – Verify trunk administered wink/immediate-start parameter.

   2 – Verify the dial type.

   3 – Refer problem to the CO.

b. Rotary dial before wink – This condition occurs when the CO starts dialing before the PBX sends wink on a wink-start trunk. 1 – Verify trunk administered wink/immediate-start parameter.

   2 – Refer problem to CO.

c. Rotary dial too early – This condition occurs when the CO starts dialing too soon after seizure on an immediate-start trunk.

   1 – Verify trunk administered wink/immediate-start parameter.

   2 – Refer problem to CO.

d. Rotary dial pulse during wink – This condition occurs when the CO sends rotary dial digits too soon after seizure on a wink-start trunk.

   1 – Verify trunk administered wink/immediate-start parameter.

   2 – Refer problem to CO.

e. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

f. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

g. Rotary dial pulse on-hook longer than 105 msec – Break between rotary pulses is too long.

   1 – Test trunk by performing an incoming test call.

   2 – Refer problem to CO.

h. Rotary dial rate below eight pulses/sec – More than 135 msec between two successive breaks.

   1 – Verify trunk administered interdigit-timing parameters.

   2 – Refer problem to CO.

i. Rotary dial rate above 12 pulses/sec – Less than 75 msec between two successive breaks.

   1 – Verify trunk administered interdigit-timing parameters.

   2 – Refer problem to CO.

j. Digit detection – Co is starting new rotary dial digit within 150 msec of previous digit.

   1 – Verify trunk administered interdigit timing parameters.

   2 – Refer problem to CO.

k. Loop current active – CO not releasing trunk after PBX disconnect. Occurs when the PBX end drops first and the CO does not release the trunk within four minutes.

   1 – Verify the interface to the network with a hand telephone set. If calls are placed correctly, then refer problem to the CO.

   2 – If unable to place calls or this equipment is not available, check the status on port using the **status trunk** command. If active but not connected, disconnect bridging clips at the network interface. Check status on the trunk. If trunk went idle, then replace clips. If trunk is still active but unable to place calls, refer problem to the CO.

l. Late CO trunk release – This event only happens after the occurrence of Error Type 513. The CO released the trunk four minutes after the PBX dropped the call. This event decrements the severity (error count) of Error Type 513, or may mean the problem related to Error Type 513 has been fixed.

   1 – Verify that Error Type 513 does not occur again. Refer to Error 513.

m. Incomplete Dial timer expired. This error applies only to the TN459. Problem with incoming dialing stream. Refer problem to the CO.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *DID-TRK Loop Around and Conference Circuit Test,* for example, you may also clear errors generated from subsequent tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Port Diagnostic Test (#35)	X	X	ND
Loop Around and Conference Circuit Test (#33)		X	ND
Port Audit Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-96. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is active but the port is not in use (no calls), then check the Error Log for Error Type 513 (see Error Log table for description of this error and required actions). The port may be locked up. 2. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-96. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-96. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-96. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails..
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Loop Around and Conference Circuit Test (#33)

This test checks the reflective and non-reflective loop around and conference capabilities of a DID port circuit. The test that uses 404-Hz, 1004-Hz, and 2804-Hz tones is an on-board test only. Each tone is separately transmitted to and from the port (loop around within the port) and verified.

This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from trunk administration Test field. (This also disables the port diagnostic test.)

Table 11-97. TEST #33 Loop Around and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is active but the port is not in use (no calls), check the Error Log for Error Type 513 (see Error Log table for description of this error and required actions). The port may be locked up. 2. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-97. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook), if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n." To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."
2000	ABORT	Response to the test was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-97. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	System resources required to run this test are not available. This may be due to the port being seized. 1. This abort code is usually associated with tone-clock (TONE-BD, TONE-PT, and TDM-CLK) resources. First, clear any tone errors in the error log. 2. Retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-97. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	The nonreflective 1004 Hz tone test of the port failed. An echo was detected from the port. Poor quality transmission was detected to or from the port. The problem may be off-board.
7		The conference capabilities of the port failed. Poor quality transmission was detected to or from the port. The problem may be off-board.
129		The reflective 404-Hz tone test failed. Poor quality transmission was detected to or from the port. The problem may be off-board.
131		The reflective 1004-Hz tone test failed. Poor quality transmission was detected to or from the port. The problem may be off-board.
133		The reflective 2804-Hz tone test failed. Poor quality transmission was detected to or from the port. The problem may be off-board. **CAUTION:** *The port may still be operational, or the fault may be off-board (connections or CO). Off-board problems also include incoming seizures or off-hook port seizures during the test and, perhaps somewhat unlikely, noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company to temporarily alleviate the alarm caused by the failure of this test. The test may be disabled from trunk administration 'Test' field. This turns off all testing for that trunk group except for tests 6 and 36.* *More information continues on the next page.*

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Table 11-97. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3 7 129 131 133 *(cont'd.)*	FAIL *(cont'd.)*	FAULT ISOLATION: Proceed as follows unless power or tone problems are suspected (see note below). 1. To make sure the problem is on-board, disconnect the port from the far-end and retry the test. Coordinate this with the CO, or do it after busy hours. 2. If the retry fails, replace the circuit pack. 3. If the retry passes and no troubles have been reported, disable the test in the trunk group administration. If the retry passes and troubles have been reported, coordinate isolation with the CO. **NOTE:** If the loop around and conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test. If the test fails again, see 'FAULT ISOLATION' above.
	PASS	DID Trunk Loop Around and Conference Test is successful. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port and refer problem to the CO.

Continued on next page

Table 11-97. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Port Diagnostic Test (#35)

This test checks a port's battery feed circuitry. The battery feed circuitry is tested for on-/off-hook detection, battery shutdown, and battery reversal (WINK) capabilities.

Table 11-98. TEST #35 Port Diagnostic Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required to run this test were not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), then check the error log for error type 513 (refer to the Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, busyout and release the trunk, and then retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, check for wiring errors toward the CO which may cause the trunk to lock up. 4. If the wiring is OK and the test continues to abort, replace the TN753.

Continued on next page

Table 11-98. TEST #35 Port Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test has been disabled by trunk group administration. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n." To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-98. TEST #35 Port Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
61446	FAIL	Battery feed test failed. A loop current fault was detected. This is most probably an incoming CO-line problem. This failure code is only reported by the TN2139 Italian DID circuit pack. 1. Check the incoming CO-line for loop current. If none is detected refer the problem to the CO. 2. If the CO-line checks out OK, the failure must be on the DID port. Replace the circuit pack.
61456	FAIL	Battery feed test failed. An on-board problem was detected. This port is out-of-service. 1. Replace circuit pack.
61472	FAIL	Battery feed test failed. A problem with the incoming CO-line was detected. 1. Check the incoming CO-line for proper operation. If warranted, refer the problem to the CO. 2. If the CO-line checks out OK, the failure must be on the DID port. Replace the circuit pack.
	PASS	Current flow was detected for this port. 1. User-reported troubles on this port should be investigated using other port tests and by examining connections. 2. Refer problem to the CO.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Port Audit Update Test (#36)

This test sends updates of the DID port translation for all ports on the circuit pack that have been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack. No response message is expected from the circuit pack once it receives translation updates. The port translation data includes: wink or immediate start trunk, dial tone or rotary dialing trunk, rotary dialing inter-digit timing, Network balance R/RC, and disconnect timing.

Table 11-99. TEST #36 Port Audit Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1006	ABORT	The port has been placed out of service, perhaps by craft busyout. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is out of service, then the port is unavailable for certain tests. You must wait until the port is in service and idle before retesting. 1. If the port status is in service and idle, then retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run the test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to fail, escalate the problem.

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Table 11-99. TEST #36 Port Audit Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	This test passed. Translation information was successfully updated on the circuit pack. 1. If signaling troubles are reported (Error Types 1, 257, or 513 in Error Log table), verify translation information for this port. 2. Refer problem to the CO. If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: 1. Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

DIG-BD (Digital Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DIG-BD	MIN	test board PCSS sh	Digital Line Circuit Pack
DIG-BD	WRN	test board PCSS sh	Digital Line Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also DIG-LINE (Digital Line) Maintenance documentation for related line information.

DIG-LINE (Digital Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DIG-LINE	MINOR	test port PCSSpp l	Digital Line
DIG-LINE	WARNING	test port PCSSpp sh	Digital Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

DIG-LINE maintenance monitors and tests ports on Digital Line circuit packs and the hardware connected to those ports for lines administered as a digital station. These include stations with just a digital voice terminal and stations with a digital voice terminal and a linked data module. Stand-alone data modules, and data adaptors in stand-alone mode, are covered by the PDMODULE and TDMODULE maintenance objects. Circuit pack-level maintenance is covered by DIG-BD whose strategy is described in the XXX-BD section of this chapter. The following circuit packs support digital lines:

Digital Line Circuit Packs

Code	Ports	Type	Companding	Endpoints
TN413	8	4-wire DCP	A-law	7400 series digital voice terminals, attendant consoles, 510D personal terminals, MT515 BCTs, DCP data modules
TN754	8	4-wire DCP	mu-law	
TN754B	8	4-wire DCP	A-law/mu-law	
TN2181	16	2-wire IDCP	A-law/mu-law	
TN2224	24	2-wire IDCP	A-law/mu-law	
TN2136	8	2-Wire IDCP	A-law/mu-law	Data Adaptors (DA), Italtel Digital Telephone Models 1 and 2 (IDT1/2).
TN2177	16	2-wire IDCP	A-law/mu-law	
TN2181	16	2-wire IDCP	A-law/mu-law	
TN2224	24	2-wire IDCP	A-law/mu-law	

G3r V1 systems support only TN754 and TN754B. TN413 and TN754 are found only in upgraded cabinets.

Each digital line port supports two 64 kbps information channels (primary and secondary) and one 8kbps signaling channel. Digital voice terminals always use the primary information channel. Thus only one voice terminal can be connected to each port. The secondary information channel can be used to connect a data terminal via a Digital Terminal Data Module (DTDM) or a Data Adaptor (DA). All other devices currently supported by Digital Line circuit packs communicate on the primary information channel. Figure 11-29 shows examples of digital line connectivity.

Only the TN754B or TN2136 should be used in out-of-building applications. For important information pertaining to protection required for out-of-building digital voice terminals, see *DEFINITY Communications System Generic 1 and Generic 3 Installation and Test,* 555-230-104.

It should be noted that TN2181 and TN2224 supports both modes as shown in Figure 11-29 and Figure 11-30.

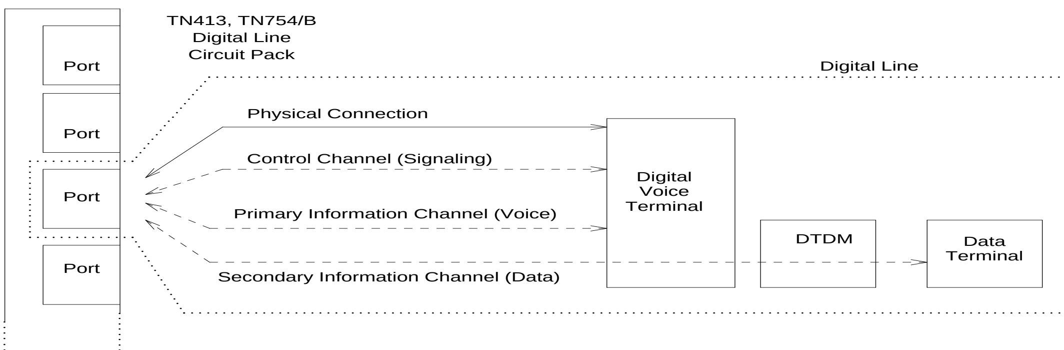

Figure 11-29. Digital Line Connectivity

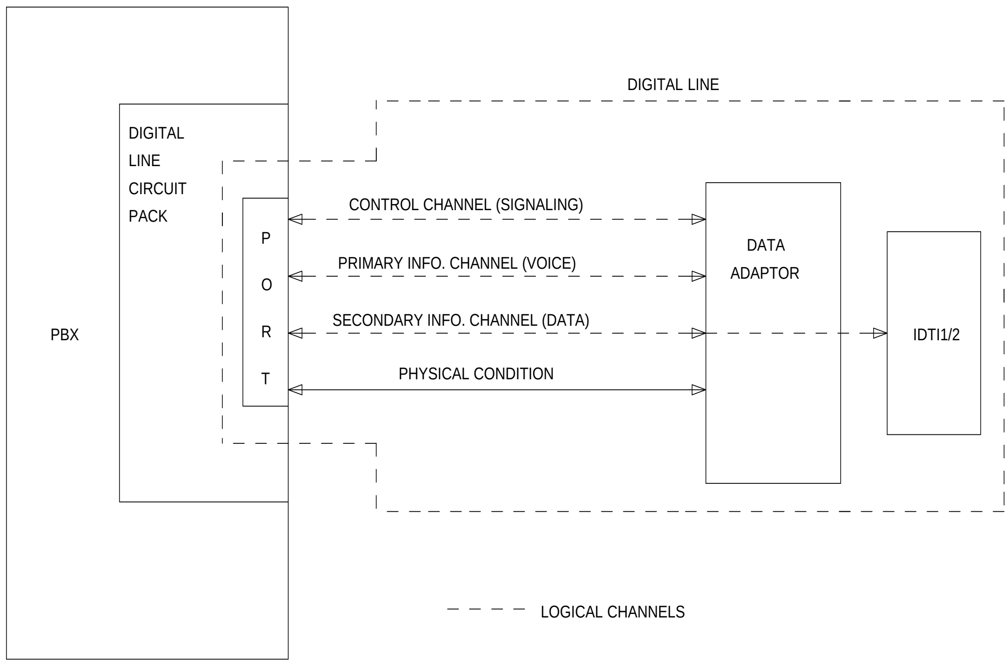

Figure 11-30. Digital Line Connectivity

Only 2-wire Italtel Digital Telephone Models 1 and 2 (IDT1/2) or DAs can be directly connected to a TN2136. AT&T DCP (4-wire) digital voice terminals and data modules can be connected to these circuit packs via Italtel's 2/4-wire adapter. DAs can operate in either of two modes which are covered by different maintenance objects:

DA Mode	Administered as:	Endpoint	Maintenance Object
Stand-alone	PDM	Data endpoint only	PDMODULE
Linked	DTDM	IDT1/2 and optional data terminal	DIG-LINE

Digital Line maintenance interacts with Digital Line circuit pack (DIG-BD) maintenance, and results of DIG-LINE testing can be affected by the health of the Digital Line circuit pack. Keep this in mind when investigating reported Digital Line problems.

There are instances where the service state of a station is mentioned. It is helpful to understand what os ment by the different service states that may exist. The different service states which apply to digital line station are explained as follows.:

Out-of-Service	The port, and thus the station, have been removed from service. Busyouts put the port in the out-of-service state.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally. It can also be forced into the in-service state by going off-hook.

Downloading of Terminal Parameters

Programmable Terminals

The following information is presented as background information to help understand how maintenance software interacts with terminal parameter downloading.

Terminal Types:

The following terminals can be downloaded for Definity G3V3 and later versions:

a. 84xx multibutton digital voice terminals (8403D01A, 8410B, 8410D02A, 8434D01A) with optional expansion module.

b. 603A1 and 603D1 Callmaster terminals for telemarketing applications.

c. 302B1 attendant console.

Circuit Packs:

1. 8400x, 302B1 Terminals
   - a. TN754 (4-wire, Mu-law)

     Minimum usable vintage for 8410D and 8434D terminals - V11
   - b. TN413 (4-wire, A-law)
   - c. TN754B (4-wire, A-law/Mu-law selectable)
   - d. TN2177 (2-wire, 16-port, A-law/Mu-law selectable)
   - e. TN2181 (2-wire, 16-port, A-law/Mu-law selectable)
   - f. TN2224 (2-wire, 24-port, A-law/mu-law selectable)

2. 603A1/D1 Terminals
    a. TN754 (4-wire, Mu-law),
    b. TN413 (4-wire, A-law)
    c. TN754B (4-wire, A-law/Mu-law selectable)

Downloadable Terminal Parameters

The following parameters are downloaded to programmable terminals:

DOWNLOADABLE PARAMETERS

Parameter	Scope	Terminal
International Flags (A-law/Mu-law, Display Mode, DLI Voltage level)	System level	84xx, 603x, 302B1
Primary Levels (Transmission & Sidetone)	System level	84xx, 603x, 302B1
Adjunct Levels (Transmission & Sidetone)	System level	84xx
Handset Expander Option	System level	84xx
Administrable Options (Speakerphone & Mute Button)	Per-terminal	84xx
Administrable Softkeys	Per-terminal, System level	8410D, 8434D

Nonvolatile Memory

Nonvolatile memory is used to store downloadable parameters in programmable terminals. Therefore, once the terminal has been downloaded, it is not be necessary to download it again, even if power is removed from the terminal.

If the nonvolatile memory fails with power still present, the terminal will revert to its default factory settings except for its A-law/Mu-law companding settings which are stored in RAM. If power is removed after the nonvolatile memory fails, the terminal will revert to its factory default settings.

Mu-law companding is assigned as a default setting at the factory, so, for domestic use, a programmable terminal can place calls even though it has not been downloaded from the PBX.

Download Actions

There are several different scenarios which will cause a terminal to be downloaded. As described below, these can occur as part of background maintenance activity or on demand from the System Access Terminal or from a station.

For the background actions described below, the terminal will be downloaded automatically if a download retry flag for the terminal is set in software. This flag is set at the time translation is loaded at boot time, when translation which affects the parameters of a terminal is changed as part of system administration actions, and when a port is inserted in software as a result of board insertion or translation change.

Automatic Download Actions

1. System Reboot/Restart

   A global download action is started when periodic maintenance tests start after a system reboot/restart regardless of whether the parameters have been downloaded previously.

2. Periodic Tests

   If the download flag is still set when periodic tests are run on a terminal, a download action will occur. This operation is required in case a terminal could not be downloaded previously because it was off-hook at the time the system first booted or because the terminal was off-hook at the time translation associated with downloadable parameters was changed.

   Note that it may take more than an hour for periodic tests to reach the terminal that needs to be downloaded.

3. Terminal Administration

   A downloadable terminal is automatically downloaded when translation changes associated with downloadable parameters are made as part of system administration. As shown in Table 11-100, these changes can be for a specified terminal or may be system-wide. If the change is for system-level parameter, a background global update request is made to download all programmable terminals.

   This global update may take more than an hour for a system with several thousand programmable terminals.

4. Port Insertion

   Whenever maintenance software initiates a request to place a port into service, a terminal download action is started on that terminal if that terminal is programmable. This port insertion action occurs under the following circumstances:

   a. A digital line circuit pack that is physically inserted into the system has ports currently administered for programmable terminals.

If more than 20 port insertion requests are received within a few seconds, a global download request is started up as a background task. This action updates all programmable terminals instead of just those being inserted. This is done to avoid system overload for situations where there is massive board insertion. This could occur when connectivity to an EPN is reestablished after that EPN was down.

b. A station port is added to the system by a "**add station**" or "**change station**" command.

c. A TTI port is activated.

5. Audits

   As part of periodic maintenance, the hardware status audit test queries programmable terminals to determine which levels and/or options are being used. If the reported values are not equal to the administered values, the system will initiate a terminal download action. This audit does NOT check the parameters used for softkeys.

6. Activation of TTI

   A terminal is downloaded automatically when it is activated using the Terminal Translation Initialization feature. Therefore, no special user actions are required for TTI.

   NOTE:
   Plugging the station cord into a terminal does not automatically cause the terminal to be downloaded. If this terminal has factory defaults or if the terminal has been previously downloaded with parameters different than those desired, use one of the demand download actions described below to download the terminal.

Demand Download Actions

1. Busyout/Release Command

   A maintenance demand busyout/release request for a station will cause the terminal to be downloaded regardless of its previous download status.

2. Feature Access Code

   A Refresh Terminal Parameters Feature Access Code can be used to request a terminal download action. When this code is followed by a "#", the programmable parameters for the current terminal are downloaded when the terminal goes on hook. When this code is followed by an extension, the programmable parameters for the specified station are downloaded.

   This Refresh Terminal Parameters Feature Access Code is assigned on the second page of the "feature-access-codes" screen.

A confirmation is returned if the download request is accepted. A busy tone is returned if the request is made from a different station when the target station is off-hook.

The first three green call appearance LEDs on the 84xx 603x terminal will be turned on for three seconds if the station was successfully downloaded as a result of an entry of a Refresh Terminal Parameters Facility Access Code. This is not true for the 302B1 terminal.

There is no visible display on a station for the other background or demand download actions. As described below, the "status station" and "status attendant" screens can be used to check the download status of a specified terminal.

Status of Parameter Downloads

The "status station" and "status attendant" screens display the current download status of individual 84xx, 603, and 301B1 terminals in the Download Status field. The possible download states are:

Table 11-100. Terminal Download Status

Status	Terminal Down Load State
Complete	Terminal successfully downloaded sometime in the past.
Pending	System waiting to download the terminal. This may require the execution of a background periodic test which could take more than an hour. A demand download as described above may also be used to initiate an immediate download.
Not Applicable	Not a programmable terminal.

Possible reasons for terminal being not downloaded include:

— Terminal is off-hook.

— Terminal detected a bad checksum.

— Terminal detected a bad or missing EEPROM (refer to hardware error log).

— Terminal is busy programming data from a previous PROGRAM message.

— Terminal is in the Programming Disabled state.

— Terminal is in the Local Program Options Mode.

— Terminal is disconnected or out of service (use **status station** command).

Hardware Error Log Entries and Test to Clear Values

Digital Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port *UUCSSpp* sh r 1
1 (a)	40987	None	WARNING	OFF	
1 (b)	1 to 20	None	WARNING	OFF	
18 (c)	0	busyout port *UUCSSpp*	WARNING	OFF	rel port *UUCSSpp*
130 (d)		None	WARNING	ON	test port *UUCSSpp* sh
257 (e)	40971	None			
513	0	Station (Digital) Audits Test (#17)	WARNING(o)	OFF	test port *UUCSSpp* sh r 6
767 (f)	40964	None	WARNING	OFF	
769 (g)	40963 40988	None	WARNING	OFF	
1026(o)		NONE	WARNING	OFF	
1281	Any	Station (Digital) Audits Test (#17)	WARNING	OFF	test port *UUCSSpp* sh r 4
1537 (h)	40968	None	WARNING	OFF	
1793		Voice & Ctrl. Local Loop Test (#13)	MINOR/ WARNING[2]	ON	test port *UUCSSpp* l r 3
2049		NPE Crosstalk Test (#9)	MINOR/ WARNING[3]	ON	test port *UUCSSpp* l r 3
2304 (n)		None			
2305 (i)	32770	None			
2305 (h)	40967	None			
3840 (k)	40965	None			
3840 (l)	40989	None			
3841 (m)	41029	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command.

3 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command.

Notes:

a. Could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

b. This Error Type and Aux Data will occur when at least 15 off-board problems have been detected with the link to the terminal. When an error with the link is detected, an on-board counter is incremented.

   The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

c. This error type is logged when the port in question is busied out by maintenance personnel. Make sure port is released from busyout via the **release port UUCSS pp/PCSSpp** command.

d. This error type indicates that the circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

e. Problems transmitting to the voice terminal. This problem can be caused by defective wiring. Defective wiring can cause varying degrees of problems on different types of sets. Sets such as the 7410 appear to be more susceptible to wiring problems than other sets. This is usually an on-board problem and can be ignored if no user complaints are received.

f. This is an in-line event that produces this error type when a favorable response is received from running the Digital Line Electronic Power Feed Test (#11). No craft action is necessary. This alarm will be resolved with the passing of time.

g. With Aux Data 40963, this error type is a result of an unfavorable response to the Electronic Power Feed/ Positive Temperature Coefficient Test (#11). With Aux Data 40988, this error type indicates that the EPF/PTC circuit has been turned off due to an overcurrent condition.

   For TN754 vintage 13 or earlier and TN413, the EPF circuit senses an overcurrent condition at the voice terminal. Check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

   For TN754 vintage 14 or later, TN754B and TN2136, the PTC will open if there is a short on the power line for 1/2 second or longer. The voice terminal is probably not operating properly. Unplug the voice terminal for

30 seconds and then plug it back in. If the voice terminal still does not operate, then check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

Once the problem has been resolved, it may take up to 1 hour for the alarm to clear due to “leaky bucket” strategy. If the problem cannot be resolved by one of the steps above, then replace the circuit pack.

h. An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

i. This indicates that the station went off-hook while it was in the ready-for-service state. Use the **status station** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No craft action is necessary.

j. This is the code that is generated when the link between the circuit pack and the voice terminal is successfully reset. No craft action is necessary.

k. No terminal is connected to the Digital Line board. No maintenance action is required.

l. An uplink message has been logged indicating that the Electric Power Feed (EPF) is on with no load on it. No action is necessary.

m. The circuit pack’s message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack. No action is necessary.

n. Internal system error. No action is necessary.

o. There is a problem with the voice terminal EEPROM. When the voice terminal is repaired the alarm will be resolved with the passing of time.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Voice and Control Channel Local Loop Around Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Terminal Remote Loop Around Test (#1201)		X	D
Voice and Control Channel Local Loop Around Test (#13)		X	ND
Digital Line NPE Crosstalk Test (#9)		X	ND
Digital Line Electronic Power Feed Test (#11)		X	ND
DIG-LINE Station Lamp Updates Test (#16)	X	X	ND
Station (Digital) Audits Test (#17)	X	X	ND

1 D = Destructive; ND = Nondestructive

Digital Terminal Remote Loop Around Test (#1201)

This test checks the integrity of the connection between the SPE and the attached Digital Terminal and the ability of the terminal and the associated port to send and receive data. This test is based, in principal, on procedure 622 used in system 85 to help isolate digital terminal problems.

A request is presented to the terminal to go into loop back mode. Then data is sent to the terminal and when received back, checked for consistency. This test is run as a part of the craft command "test long" procedure. It is not included in any error recovery strategy and generates no Error Log entries or alarms. To begin the test, Maintenance will ask Call Processing to make the associated end point and port " Maintenance Busy". This test will succeed if the endpoint is "idle". If the reserve request fails then the test will abort. If the request succeeds then the SPE sends a message to loop around both information channels for the digital terminal. First the primary information (voice, Information Channel 1 or I1) channel loop back test is run. The test is performed by sending a digital count from the Tone/Clock circuit pack on the primary information channel time slot and receiving the same digital count with a general purpose tone detector.

If the primary information channel test is successful, the loop around test for the secondary information (data, Information Channel 2 or I2) channel is then performed. This test is the same as the primary information channel loop around test and is performed only if a DTDM is administered, which is also the case for a linked DA.

Only one value (Pass. Fail, or Abort) is generated as a result of the two tests run. If any test fails aborts, the sequence is stopped. Upon completion of this test the associated endpoint and port are moved back into the previous service state.

Table 11-101. TEST #1201 Digital Terminal Remote Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port**UUCSSpp/PCSSpp command to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain test. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before re-testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM-Bus) Maintenance to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-101. TEST #1201 Digital Terminal Remote Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out of service. 1. Look for TTR-LEV errors in the Error Log. If present refer to TTR-LEV (TTR-Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exist, retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port**UUCSSpp command to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain test. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before resetting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The installed circuit pack does not support this operation.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-101. TEST #1201 Digital Terminal Remote Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	System resources required to run this test are not available. 1. Make sure terminal is connected and repeat test. 2. If the test continues to abort, escalate the problem. 3. If test fails replace terminal and repeat test. 4. Retry the command at 1-minute intervals a maximum of 5 times.
14	FAIL	The primary channel (voice, Information Channel 1 or I1) is not operating properly. User impact may range from noticing nothing to not being able to use the port. Check the results of "Voice and Control Channel Local Loop Test (#13). If that test fails, suspect the Digital Line circuit pack. If that test passes then replace the terminal. If both test fail, and component replacement does not change the results, then: 1. Run circuit pack tests to check the tone generator circuit pack and the Tone Detector circuit pack using the **test board** UUCSS s command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit pack are functioning properly, and the tests still fail, escalate the problem. (*(Continued)*

Continued on next page

Table 11-101. TEST #1201 Digital Terminal Remote Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	The system will not allow this test to be run because the station is/has not been busied out. Busy out the station with the /E3busyout station/E1 command.
16	FAIL	The secondary channel (data Information Channel 2 or I2 is not operating properly. User impact may range from noticing nothing to not being able to use this terminal. Check the results of "Voice and Control Channel Local Loop Test (#13). If that test fails, suspect the Digital Line circuit pack. If that test passes then replace the terminal. If both test fail, and component replacement does not change the results, then: 1. Run circuit pack tests to check the tone generator circuit pack and the Tone Detector circuit pack using the **test board** UUCSS s command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit pack are functioning properly, and the tests still fail, escalate the problem.
	PASS	Voice and Control Channel Local Loop test passed. All channels are transmitting properly. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of ten times to make sure it continues to pass. 2. If complaints persist (noisy connections for voice. corrupted data transfer for data), examine the station, connections, and wiring.

Digital Line NPE Crosstalk Test (#9)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete. Crosstalk testing is performed on both the primary information channel (voice) and the secondary information channel (data) associated with each digital station port. If this test fails on either channel, the station and the DTDM are taken out-of-service.

Table 11-102. TEST #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test. 1. Check the port status. Use the **display port** UUCSSpp command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for this test. You will have to wait until the port is idle. 2. If the port status is idle, then retry the command a 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
2	ABORT	During testing of DTDM, system resources may not have been available. Also, the port may have been busy during the test. 1. Check if port is being used. If possible, disconnect by toggling disconnect button on DTDM. Retry command after 1 minute. **WARNING:** *This action will drop the call in progress.* 2. If the test continues to abort after 5 attempts, escalate the problem.

Continued on next page

Table 11-102. TEST #9 Digital Line NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port** UUCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-102. TEST #9 Digital Line NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display port** UUCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out.
1020	ABORT	Test disabled via background testing. Use **status station** command to determine when station is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-102. TEST #9 Digital Line NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 2	FAIL	The Network Processing Element (NPE) of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. Failure code 1 indicates that the Crosstalk test failed on the primary channel. Failure code 2 indicates that the Crosstalk test failed on the secondary channel. 1. Replace circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times to make sure it continues to pass. 2. If complaints persist, examine the station, connections, and wiring.

Continued on next page

Digital Line Electronic Power Feed/Positive Temperature Coefficient/PPF Test(#11)

For TN413, and TN754 vintage 13 or earlier, this is an Electronic Power Feed (EPF) restoral test. In this test, the processor requests that the EPF be turned on for a given port, and an attempt is made to turn on the power supply to the station. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed, there may be a short in the loop. A message is returned reporting that either the EPF was successfully turned on, or that an overcurrent condition was sensed. This test is repeated again 5 seconds later.

For TN754 vintage 14 or later, TN754B and TN2136 this is a Positive Temperature Coefficient (PTC) restoral test. In this test, the processor requests that the PTC be turned on for a given port, and an attempt is made to turn on the power supply to the station. If an overcurrent condition is sensed, there is probably a short on the power line that causing the PTC to open and disconnect the voice terminal. Since the PTC does not have self-restoral capability, the voice terminal must be manually unplugged for 30 seconds and then plugged back in to restore the PTC. A message is returned reporting that either the PTC was successfully turned on successfully with no problem or an overcurrent condition was sensed. This test is repeated again 5 seconds later.

TN2181 and TN2224 boards carry a Protected Power Feed (PPF) relays, one for each port. Therefore this will be a Protected Power Feed restoral test. The test procedure and its response is same as that of EPF. One of differences between EFP and PPF is that, if the port goes into a overcurrent state, PPF does not report this change of state because it is a transient state which will not last more than 50ms. If the over current persists the power will be shut off automatically and an EPF_off_overcurrent message is sent uplink.

Table 11-103. TEST #11 Digital Line Electronic Power Feed Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-103. TEST #11 Digital Line Electronic Power Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port** UUCSSpp/PCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-103. TEST #11 Digital Line Electronic Power Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Electronic Power Feed Test passed. The message to turn on the power to the station was successfully sent to the port. 1. Although this test will never actually return a FAIL result except for the **Internal System Error** described above, it will log an error indicating the real results of the test. Check the Error Log for any entries with Error Types 767 or 769 after the test completes. 2. If Error Type 767 appears in the Error Log, this should indicate that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station, if available, and check that all the feature buttons are operating. 3. If Error Type 769 appears in the Error Log, this indicates some problem with the power to the station. Check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.

Voice and Control Channel Local Loop Test (#13)

These tests check the information and control channels between the Switch Processing Element (SPE) and the Digital Line port circuit. The SPE sends a message to loop around both the information and control channels for the port. First, the primary information (voice) channel loop back test is run. The test is performed by sending a digital count from the Tone-Clock circuit pack on the primary information channel time slot and receiving the same digital count with a general purpose Tone Detector.

While the primary information channel is still looped around, the Control Channel Loop Around Test is performed. This test consists of sending four different transparent patterns to the on-board microprocessor, receiving them back, and comparing them.

The Loop Around Test for the secondary information (data) channel is then performed. This test is the same as the primary information channel loop around test and is performed only if a DTDM is administered.

A Conference Test is done next for the primary information channel. This test is the same as Conference Test #6.

Only one value (Pass, Fail, or Abort) is generated as a result of four tests run. If any test fails or aborts, the sequence is stopped.

Table 11-104. TEST #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port** UUCSSpp/PCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-104. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display port** UUCSSpp/PCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort and the port is not in use, escalate the problem.

Continued on next page

Table 11-104. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Rerun the test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
7	FAIL	Conference Test failed on primary channel. In some cases, users may not notice disruption in service. In extreme cases, conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.

Continued on next page

Table 11-104. TEST #13 Voice and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
15	FAIL	The control channel between the processor and digital circuit pack is not transmitting properly. User impact may range from noticing nothing to not being able to use the port. Could also be disruptive to other users.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port. 1. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using the **test board UUCSS s/PCSS s** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Digital Line circuit pack.
	PASS	Voice and Control Channel Local Loop test passed. All channels are transmitting properly. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times to make sure it continues to pass. 2. If complaints persist (noisy connections for voice, corrupted data for data transfer), examine the station, connections, and wiring.

DIG-LINE Station Lamp Updates Test (#16)

This test lights all lamps on the terminal as specified. The lamp updates will run only if the station is in-service. The status of the station is checked and the lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 11-105. TEST #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
3	ABORT	Station may be in ready-for-service or out-of-service state. 1. Use **status station** command to verify state of station. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-105. TEST #16 DIG-LINE Station Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port** UUCSSpp/PCSSpp to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-105. TEST #16 DIG-LINE Station Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. 1. Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a `t` for the port). 2. If either **list config** or **display port** indicates that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	The message to light all of the station lamps was sent successfully to the port. 1. Observe the station lamps being lit when running the test. If all lamps do not light successfully, the other Digital Line test results may indicate related problems that will not allow the lamps to light. 2. Investigate by using other Digital Line port tests, and by examining the station, wiring, and connections.

Digital Station Audits Test (#17)

This is a series of six tests which are classified as audits. The SPE sends messages to the on-board microprocessor to perform the following tests. These audits run only if the station is in-service.

- Switchhook Inquiry Test — This is an update of the SPE records according to the circuit pack's records. This inquiry is sent all the way to the voice terminal.
- Bad Scan Inquiry Test — A message is sent uplink which contains a count that is generated due to certain events relating to the link conditions. This can be an indication of communications problems between the Processor and Digital Port circuit pack.
- EPF/PTC Inquiry Test — For a TN413 or a TN754 vintage 13 or earlier, the status of the Electronic Power Feed (EPF) is sent uplink. Possible conditions are: EPF-on-ok, EPF-off, and EPF-no-load. For TN754 vintage 14 or later, TN754B or TN2136, TN2181, TN2224, the status of the Positive Temperature Coefficient (PTC) is sent uplink. Possible conditions are: PTC-on-ok, PTC-off, and PTC-no-load.
- ID Request Test — A request is made to the station for its status. The station sends its configuration information and health information back. This information is checked and a pass/fail result is provided.
- Ringer Update Test — This updates the digital telephone ringer state according to the processor records.
- DTMF Administration Update Test — This is a message to the digital station to refresh the default value which causes the station to send touch-tones only in the primary information channel. This value is set initially when the station is put in-service and every time the station's state changes from other states to in-service.

Table 11-106. TEST #17 Station (Digital) Audits Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Switchhook audit timed out.
2	ABORT	ID request fails, health bit returned from voice terminal is bad. 1. Make sure voice terminal is connected and repeat test. 2. If test fails, replace voice terminal and repeat test. 3. If the test continues to abort, escalate the problem.
3	ABORT	The EPF/PTC has detected an overcurrent condition. 1. For a TN754 vintage 13 or earlier Digital Line circuit pack, issue the **test** UUCSSpp/PCSSpp **long** command. If Test #11 passes, then the EPF/PTC condition has been cleared. Rerun the Short Test Sequence. If Test #11 does not pass, follow the repair procedures described for Test #11. 2. Look for Error Type 769 logged against DIG-LINE and follow the procedures in the associated footnote. If any additional problems are found after completion of maintenance procedures, rerun the test. 3. If the test continues to abort, escalate the problem.
4	ABORT	Internal System Error 1. Resolve any outstanding circuit pack maintenance problems. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
5	ABORT	Ringer update aborted due to station being in ready-for-service or out-of-service state.

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Table 11-106. TEST #17 Station (Digital) Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
6	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, the release the port via the **release station** 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. 1. Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a `t` for the port). 2. If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
	FAIL	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.
	PASS	Station Audits passed. This Digital Port circuit pack is functioning properly. 1. If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.

DIOD-DS1 (DS1 DIOD Trunk)

MO Name As It Appears In Alarm Log	Alarm Level	Initial System Technician Command To Run	Full Name of MO
DIOD-DS1	MAJOR[1]	test trunk *group# member#* l	DS1 DIOD Trunk
DIOD-DS1	MINOR	test trunk *group# member#* l	DS1 DIOD Trunk
DIOD-DS1	WARNING	test trunk *group# member#*	DS1 DIOD Trunk

1 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed. For more information on the **set options** command, see Chapter 10, "Maintenance Commands and Trouble-Clearing Aids".

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration form. Settings must be compatible with the local environment and with parameter settings on the far-end. Refer to *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653, for information on how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

A DS1 DIOD trunk provides a link for digitized voice or data communications between the system and a central office switch. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544 Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048 Mbps link
- 32-channel mode is supported only on TN464 circuit packs and on G3r V2 systems.

The DS1-DIOD maintenance object monitors and maintains a DIOD trunk port on a TN464 UDS1 Interface circuit pack. See UDS1-BD in this chapter for more information about this circuit pack. The DS1 circuit pack supports low level CO trunk signaling interfaces for both ground-start and loop-start trunks. This maintenance strategy covers the in-line errors log, initialization tests, periodic tests, scheduled tests, demand tests, and alarm resolution and escalation.

Three trunk service states are specified by DS1 DIOD trunk maintenance:

out-of-service	The trunk is in a deactivated state and cannot be used for either incoming or outgoing calls.
in-service	The trunk is in an activated state and can be used for both incoming and outgoing calls.
disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

Hardware Error Log Entries and Test to Clear Values

DS1 DIOD Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test trunk <grp>/<mbr>
1(a)	57408				
1(a)	57487 57476 57477 57485				
15(b)	Any	Port Audit and Update Test (#36)			
18(c)	0	busyout trunk <grp>/<mbr>	WARNIN G	OFF	release trunk <grp>/<mbr>
130(d)		None	WARNIN G	ON	test trunk <grp>/<mbr>
257(e)	57392	DS1 CO Dial Tone Seizure Test (#314)	MIN/MAJ[2]	OFF	
513(f)	57393	DS1 Tie Trunk Seizure Test (#136)	MIN/MAJ[2]	OFF	
769(g)	57484				
1025(h)	51200				
1025		DS1 CO Dial Tone Seizure Test (#314)	MIN/ WRN[3]	OFF	test trunk <grp>/<mbr> r 2
1281		Conference Circuit Test (#7)	MIN/ WRN[3]	ON	test trunk <grp>/<mbr> l r 4
1537		NPE Crosstalk Test (#6)	MIN/ WRN[3]	ON	test trunk <grp>/<mbr> l r 3
1793(i)					test board PCSS l
2049(j)	57473 57474 57475				
2305(k)	50944				

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DS1 DIOD Trunk Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2562(l)	16665				
2817(m)	52992				
3840(n)		Port Audit and Update Test (#36)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command.

Notes:

a. Error Type 1—Aux Data 57408—No tip ground is detected on an outgoing call.

   Aux Data 57476—Rotary Dial before Wink.

   Aux Data 57477—Rotary Dial pulse too early.

   Aux Data 57485—Wink too short for a valid signal.

   Aux Data 57487—PBX could not get ‘‘loop close’’ signal.

   The DS1 Interface circuit pack detected a hardware fault. These errors will cause the Dial Tone Test (#314) to run and are only considered a problem if the Dial Tone Test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in the ready-for-service state (shown as ‘‘disconnected’’ by the status command), which allows only incoming calls. Run the Dial Tone Test (#314) and follow the procedures.

b. Error Type 15—This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate associated errors (if any).

c. Error Type 18—System Technician has busied out the trunk to the out-of-service state. No calls can be made on this trunk except the Facility Access Test Call. For details on this feature, refer to "Facility Test Calls" section in Chapter 5, "Routine Maintenance Procedures".

d. Error Type 130—This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. Error Type 257—The DS1 Interface circuit pack detects a hardware fault. Aux Data 57392 indicates no external release on PBX disconnect. Escalate the problem.

f. Error Type 513—The DS1 Interface circuit pack detects a hardware fault. Aux Data 57393 indicates belated external release on PBX disconnect. Escalate the problem.

g. Error Type 769—The DS1 Interface circuit pack detects a hardware fault. The Aux Data field contains the following error type:—57484, fault is detected on tip/ring. Escalate the error.

h. The DS1Interface circuit pack detects a hardware fault, and the Aux Data field contains the following error type: 51200, port is unavailable. Run the Dial Tone Test (#314) and follow procedures.

i. Error Type 1793—DS1 Interface circuit pack is out-of-service. Look for UDS1-BD errors in the Hardware Error Log if the port is on a TN464 UDS1 board. Refer to the UDS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation for details

j. Error Type 2049—With the following Aux Data:

    Aux Data 57473—Rotary dial rate below 8 pulses per second.

    Aux Data 57474—Rotary dial rate above 12 pulses per second.

    Aux Data 57475—Rotary Dial interdigit time is too short.

   The DS1 interface circuit pack detects a hardware error on the DS1 DIOD trunk. The trunk can not communicate with the far-end because it is unable to interpret digits sent from the far-end switch. Check with the far-end switch or Operating Company for proper trunk connection.

k. Error Type 2305—Recorder message, trunk could not be seized (Aux Data 50944). Run Test #314 and follow the outlined procedures.

l. Error Type 2562—Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

m. Error Type 2817—Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a two-way trunk from both the near-end and the far-end. Attempt to place the call again. If the error persists, execute the Dial Tone Seizure Test (#314) and follow those procedures.

n. Error Type 3840—Port Audit and Update Test (#36) failed due to an internal system error. Enter the **status trunk** command to verify the status of the trunk. If the trunk is out-of-service, then enter the **release trunk** command to put it back into in-service. Retry the test command. If the test continues to abort, then escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 Dial Tone Test (#314)	X	X	ND
Port Audit and Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) resides on each circuit pack with a TDM Bus interface. (The TN464 UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.) The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-107. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1001	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-107. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. The **status health** command can be used to determine if the system is experiencing heavy traffic. Refer to the TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some tone detectors may be out-of-service. The **list measurements tone-receiver** command will display information on the system's tone receivers. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status trunk** command to determine when the port is available for testing. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, and the port is not in use, escalate the problem.

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Table 11-107. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: ■ 1281—Loss of signal ■ 1793—Blue Alarm ■ 2049—Red Alarm ■ 2305—Yellow Alarm ■ 1537—Hyperactivity Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.
	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. (The TN464 UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips). The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 11-108. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status station** or **status trunk** command to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. This only applies to analog stations. 1. To enable test, set the Test field on the station administration screen for the particular analog station being tested to "y." Use the **change station extension** command.

Continued on next page

Table 11-108. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: ■ 1281—Loss of signal ■ 1793—Blue Alarm ■ 2049—Red Alarm ■ 2305—Yellow Alarm ■ 1537—Hyperactivity Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.
	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack to assure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of trunk kept in the DS1 Interface circuit pack and in the switch software.

Table 11-109. TEST #36 Port Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Test failed due to internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test will not run but will return PASS. To verify that the trunk is in-service: 1. Enter the **status trunk** command to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to step 2. 2. Enter the **release trunk** command to put the trunk back into in-service. 3. Retry the test command.

DS1 CO Dial Tone Seizure Test (#314)

DS1 CO Dial Tone Seizure Test checks the trunk's signaling capability provided by the DS1 Interface circuit pack. The maintenance software initiates the test by sending a ‘‘seizure’’ message to the DS1 Interface circuit pack and expects an ‘‘active’’ reply from the DS1 interface circuit pack. If the ‘‘active’’ message is received, then the test passes. If no message is received and the timer expires, the test is aborted. If the DS1 Interface circuit pack sends a ‘‘reorder’’ message back to maintenance software, then the test fails.

This test cannot be run on a trunk in any of the following conditions:

a. The trunk direction is administered as an incoming only trunk.

b. The trunk has been seized by a normal trunk call.

c. The trunk is administered with maintenance test disabled.

Table 11-110. TEST #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status trunk** command to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status trunk** command to determine when the port is available for testing. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1005	ABORT	Test failed due to incompatible configuration administered in trunk group form. 1. Look at the trunk group administration form and see whether the trunk is incoming only, port 24 on a DS1 Interface with common control channel signaling, or an automatic CO type such as FX. Under any of these conditions this is a normal abort.

Continued on next page

Table 11-110. TEST #314 DS1 CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	Test has been disabled via administration. 1. Verify that the ‘‘Maintenance Tests’’ field on the Trunk Group Form is set to ‘‘n.’’ To enable the test, issue the **change trunk-group x** command where ‘‘x’’ equals the number of the trunk group to be tested. Then change the entry in the ‘‘Maintenance Tests’’ field on the form to ‘‘y.’’ 2. Repeat the test.
1020	ABORT	The DS1 Interface circuit pack is out-of-service. 1. Look for UDS1-BD errors in the Hardware Error Log. If present, refer to the UDS1-BD (DS1/UDS1 Trunk Circuit Pack) Maintenance documentation. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: ■ 1281—Loss of signal ■ 1793—Blue Alarm ■ 2049—Red Alarm ■ 2305—Yellow Alarm ■ 1537—Hyperactivity Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-110. TEST #314 DS1 CO Dial Tone Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The trunk cannot be seized for an outgoing call. 1. Verify that the Trunk Type field on the trunk administration screen form matches the trunk type administered on far end switch. 2. Look for UDS1-BD errors in Hardware Error Log. If present, refer to the UDS1-BD (DS1/UDS1 Trunk Circuit Pack) Maintenance documentation. 3. Retry the test at 1-minute intervals for a maximum of 5 times. 4. If the test continues to fail, escalate the problem.
	PASS	The trunk can be seized for an outgoing call.

DIOD-TRK (DIOD Trunk), DIOD-BD (DIOD Circuit Pack) [G1.2SE]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DIOD-BD[2]	MINOR	test port PCSS s	DIOD Circuit Pack

1 Where P is the port network number (1 for PPN, 2 for EPN, and 3 for the second EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.)

2 Where **1** is Long, **s** is Short, and **r** is repeat. Refer to the XXX-BD (Common Port Board) Maintenance Documentation.

DIOD-TRK (DIOD Trunk) [G1.2SE]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DIOD-TRK	MAJOR[2]	test port PCSSpp l	DIOD Trunk
DIOD-TRK	MINOR	test port PCSSpp l	DIOD Trunk
DIOD-TRK	WARNING	test port PCSSpp l	DIOD Trunk

1 Where P is the port network number (1 for PPN, 2 for EPN, and 3 for the second EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...etc.).

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

Direct Inward and Outward Dial (TN429 DIOD) trunks are 2-wire analog lines to the CO which support the following services:

- both incoming and outgoing CO calls
- DID trunk
- DID Trunk and 1-way Outgoing DIOD

The DIOD Trunk circuit pack provides eight ports for loop-start CO. The circuit pack is an interface between the 2-wire analog line from the CO and the system's (4-wire) TDM Bus.

LOOP START OPERATION

Idle State - Tip = ground, Ring = CO Battery

A. Outgoing Call

1. PBX Off-Hook (Seize Message): Closes the Tip-Ring Loop
   a. CO Response: DC loop current + Dial tone
2. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
   a. CO Response: CO goes to idle state (see Note)

B. Incoming Call

1. CO Applies Ringing Voltage
   a. PBX Response: Detect ringing current

2. PBX Off-Hook (Answer Message): Close loop
    a. CO Response: Trip ringing, provide loop current
3. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
    a. CO Response: CO goes to idle state (see Note)

C. Direct Inward Dialing (DID)

1. CO Applies Ringing Voltage
    a. PBX Response: Detect ringing current and close loop
    b. CO Response: Send DTMF digits
    c. PBX Response: Acknowledge of Number dialed and open loop
2. PBX Off-Hook (Answer Message): Close loop
    a. CO Response: Trip ringing, provide loop current
3. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
    a. CO Response: CO goes to idle state (see Note)

NOTE:
CO does not normally provide an On-Hook (Disconnect) signal.

Hardware Error Log Entries and Test to Clear Values

DIOD Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
15 (b)	any	Port Audit Update Test (#36)			
18	0	busyout trunk <grp>/<mbr>			
769 (a)	57392	None	MAJ/MIN/ WRN[2]	ON	
1537		Dial Tone Test (#0)	MAJ/MIN/ WRN[2]	ON	test port PCSS l r 2
1793		Loop Around and Conference Test (#33)	MAJ/MIN/ WRN[2]	ON	test port PCSS l r 3
2049		NPE Cross Talk Test (#6)	MAJ/MIN/ WRN[2]	ON	test port PCSS l r 3
2561 (a,d)	57345	None			
2817 (a,e)	57393	None			
3073 (a,c)	57376	None			
3073 (a,c)	57424	None			
3585 (a,c)	57424	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Notes:

a. These are in-line errors that have no specific test associated with them. Refer to the following table for an explanation and appropriate action.

b. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

c. Aux data 57376 - No loop current on incoming call

   Aux data 57424 - No loop current on outgoing call

   These errors cause the Dial Tone Test (#0) to run and are only considered a problem if the Dial Tone Test fails (in which case Error Type 1537 also shows up). In this case, the trunk may be put in "Ready-for-Service" state (shown as "disconnected" by status command), which allows only incoming calls. Run the Dial Tone Test (#0) and follow its outlined procedures.

d. Single polarity ringing current - This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. This error code is only logged as an informational event and causes no other testing to occur.

e. Late CO Trunk release - This error indicates that the CO releases the trunk at least four minutes after the PBX dropped the call. This error code is only logged as an informational event and causes no other testing to occur.

Table 11-111. DIOD Trunk Errors with NO Tests

Error Type	Aux Data	Description and System Action	System Technician Action
769	57392	CO not releasing after call is dropped from PBX end (TN747B), or the loop is not open after a disconnect (TN765). After several occurrences, an off-board (TN747B) or on-board (TN465) warning alarm is generated.	Refer problem to CO.
2561	57345	Single polarity ringing current. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) The other cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the dial tone test also fails.	Check for other errors.

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Table 11-111. DIOD Trunk Errors with NO Tests — *Continued*

Error Type	Aux Data	Description and System Action	System Technician Action
2817	57393	CO released the trunk at least four minutes after the PBX dropped the call. This error code is log only and causes no other testing to occur. No alarm is generated.	Check for other errors.
3073	57376	No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the dial tone test and all outgoing calls should also fail.	Check for other errors.
3585	57424	No loop current on outgoing call. This error occurs on attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected.	See Note at end of table.

NOTE:
At the administration terminal, busyout the affected port, and run a Long test. If Dial Tone Test #0 passes, ignore this error. Release the port.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Dial Tone Test (#0)		X	ND
Loop Around and Conference Test (#33)		X	ND
Audit Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

Dial Tone Test (#0)

This test attempts to seize a port and checks for the return of a dial tone.

Table 11-112. TEST #0 Dial Tone Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the command **display port PCSSpp** to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-112. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Use the **status trunk** command to determine when the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test has been disabled via administration. 1. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n." To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."
1005	ABORT	Trunk has been administered as incoming-only; or DID trunk group type; dial tone can only be obtained on outgoing trunks. This is a normal condition.
2000	ABORT	Response to the test was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Trunk was seized, but dial tone could not be detected. 1. Check for errors on TONE-BD or TONE-PT. Clear any errors found and repeat test. 2. If error has still not cleared, refer problem to CO.

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Table 11-112. TEST #0 Dial Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2002	FAIL	Seizure portion of test failed due to hardware problem. Fault is usually caused by a disconnected trunk. 1. Check trunk wiring to ensure good connection; repeat test if wiring correction made. 2. Locate another identical CO trunk and swap its wiring with one under test. Repeat test on both trunks and determine if problem follows trunk or remains at original port. If problem follows trunk, refer problem to CO. If problem remains at port, replace circuit pack and repeat test. 3. If replacing circuit pack does not clear failure, escalate the problem.
1009	PASS	Detected tone was not pure dial tone. No action required.
	PASS	Trunk was seized, and dial tone was detected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port’s NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one way and noisy connections may be observed. This test is usually only part of a port’s long test sequence and takes approximately 20 to 30 seconds to complete.

Table 11-113. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-113. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM-Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-113. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

Loop Around and Conference Circuit Test (#33)

This test checks the reflective loop and conference abilities of a CO port circuit. The test uses 404 Hz, 1004 Hz, and 2804 Hz tones. Each tone is transmitted separately through the loop and checked.

Table 11-114. TEST #33 Loop Around and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate system resources to run this test.
7	ABORT	Conference Circuit Test aborted.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status trunk** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-114. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	1. Check for errors on TONE-BD or TONE-PT. If there are errors, take the appropriate actions. 2. If the Reflective Loop Around Test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, check the circuit pack for a red LED. If the red LED is on, then replace the appropriate power unit circuit pack. If neither the TN736 nor the TN752 power unit circuit pack is present, then the OLS631DB AC power unit may be defective. The system may contain a TN736 or TN752 power unit circuit pack OR an OLS631DB AC power unit, BUT NOT BOTH TYPES OF POWER UNITS. **NOTE:** To investigate problems with an OLD631DB AC power source, refer to CARR-POW Maintenance documentation. 3. Rerun the test. 4. If the test fails again, replace the circuit pack.
	PASS	CO Trunk Loop Around and Conference Test is successful. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

Port Audit Update Test (#36)

This test sends updates of the CO port translation for all ports on the circuit pack which have been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack. No response message is expected from the circuit pack once it receives translation updates. The port translation data includes: ground or loop start trunk, tone or rotary dialing trunk, rotary dialing inter-digit timing, network balance R/RC, and disconnect timing.

Table 11-115. TEST #36 Port Audit Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run the test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If test continues to fail, escalate the problem.
	PASS	This test passed. Translation information was successfully updated on the circuit pack. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring. If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: 1. Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.

DS1-BD (DS1 Interface Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
DS1-BD	MAJOR	test board PCSS sh	DS1 Interface Circuit Pack
DS1-BD	MINOR	test board PCSS l	DS1 Interface Circuit Pack
DS1-BD	WARNING	test board PCSS sh	DS1 Interface Circuit Pack

The DS1 Interface circuit pack provides an interface to the DS1 facility and is designed to support 24 DS0 channels based on a 1.544 link. These DS0 channels can be administered either as trunks to other switches or as lines to off-premises stations. The functions and maintenance strategy for the TN464 circuit packs are covered under a separate maintenance object, *UDS1-BD*.

Circuit Pack Number	24 Channel	32 Channel	Tie Trunk Signaling	CO Trunk Signaling	DID Trunk Signaling	OPS Line Signaling
TN722	x		x			
TN722B	x		x			
TN767/B/C/D/E	x		x	x	x	x
TN464B		x	x	x	x	
TN464C/D/E/F	x	x	x	x	x	x (24 channel only)

ISDN-PRI Trunk signaling (for example, Q.921, Q.931) is provided by the TN765 Processor Interface circuit pack and system software instead of by the DS1 Interface circuit pack.

The DS1 configuration for each circuit pack is administered on the DS1 Circuit Pack form. The *Bit Rate* is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. The *Country Protocol* selected is used to drive layer 3 protocol decisions based on PRI specifications specific to a given country (but not on those that are relevant to specific features). This Country Protocol is independent of the *Country* parameter administered on the *System-parameters Country-options* form. Different DS1 circuit packs may be administered with different Country Protocols, thus allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations, (for instance, between two different countries). G3iV1.1-286 systems use country protocol 1. For details, see *DEFINITY Communications System Generic 3 Implementation*, 555-230-653. See *DS1/CEPT1/ISDN-PRI Reference*, 555-025-101, for more information on ISDN.

The DS1-BD maintenance strategy covers logging the in-line errors reported by the DS1 Interface circuit pack, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms. The signaling over the DS1 link has to be synchronized between the transmitting and receiving ends to ensure error-free communication. Refer to SYNC (Synchronization) Maintenance documentation for details. Each trunk and line have its own maintenance strategies. However, all strategies depend on the health of the DS1 Interface circuit pack. Refer to the following sections for details: TIE-DS1 documentation for DS1 Tie Trunk, CO-DS1 documentation for DS1 CO Trunk, DID-DS1 documentation for DS1 DID Trunk, OPS-LINE documentation for DS1 OPS Line, ISDN-TRK documentation for DS1 ISDN Trunk, and ISDN-LNK documentation for ISDN-PRI Signaling Link Port.

The TN464E/F and TN767D/E circuit packs combined with AT&T's new 120A1 CSU Module forms an Integrated CSU. The new 120A1 CSU Module, when combined with the functionality provided by the TN767E hardware and firmware, and new switch software, provides functionality equivalent to an external, stand-alone AT&T ESF T1 CSU. The 120A1 CSU Module connects to the TN767E circuit pack on the I/O connector panel on the back of the port carrier. The new CSU Module thus becomes an integrated part of the DEFINITY system. Throughout the document, the term 120A1 will mean a 120A1 or later suffix CSU Module.

The Integrated CSU is for use in the United States of America with 1.544 Mbps DS1 service. For further details on the 120A 1 CSU Module see *DEFINITY. Communications System Generic 1, Generic 2, and Generic 3 V1 and V2 - Integrated CSU Module Installation and Operation, 555-230-193, Issue 1, December 1993*.

The TN767E and 120A1 CSU Module support on-demand loopback tests that assist in the detection of faults between the TN767E circuit pack and the CSU Module, between the Integrated CSU and the optional Customer Premises Loopback Jack, or between the Integrated CSU and remote CSU. These loopback tests are explained in detail later in this DS1-BD section, but Figure 11-31 gives a high-level overview of the loopback points.

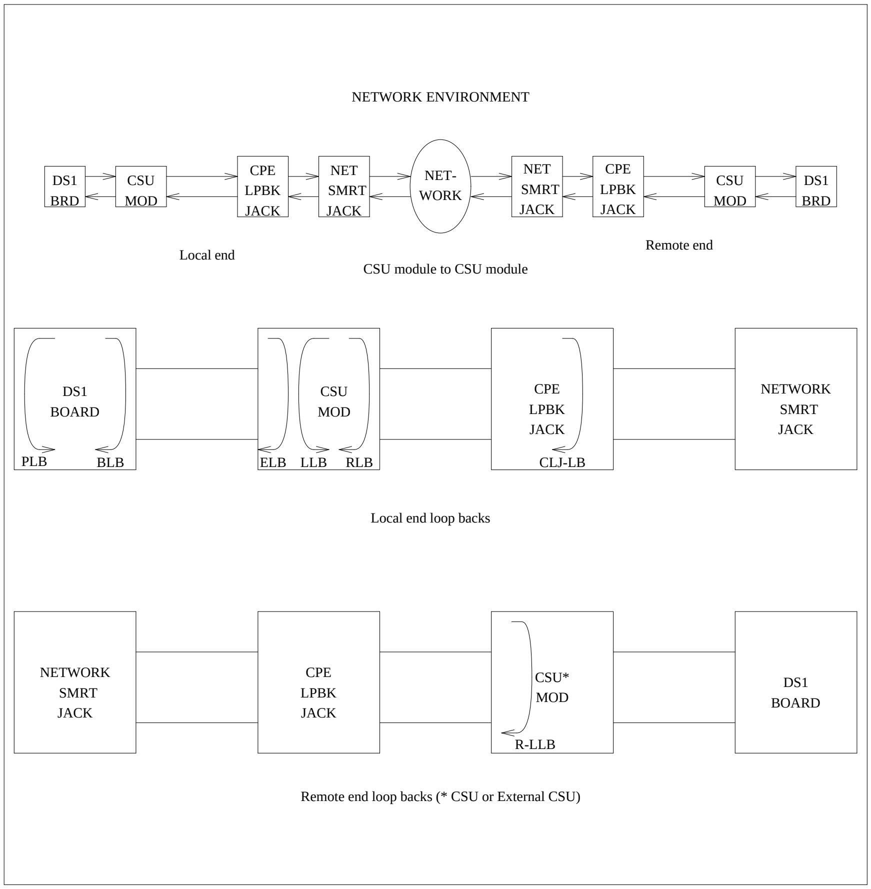

Figure 11-31. High Level Overview Of Loopback Points

The following list of acronym definitions are for Figure 11-31.

- PLB = Payload Loopback
- BLB = Board Loopback
- ELB = Equipment Loopback
- LLB = Line Loopback
- RLB = Repeater Loopback
- CLJ = CPE Loopback Jack
- R-LLB = Remote Line Loopback
- SMRT = Smart Jack
- LPBK = Loopback

Circuit Pack Administration and Options

The DS1 configuration for each circuit pack is administered on the DS1 Circuit Pack form. *Bit Rate* is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. *Country Protocol* is used to drive layer 3 protocol decisions based on PRI specifications specific to a given country (not those related to specific features). This Country Protocol is independent of the *Country* parameter administered on the country-options system-parameters form. Different UDS1 circuit packs may be administered with different Country Protocols, allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations (for example, between two different countries). US systems use country protocol 1. *Near-End CSU Type* is set to *other* for no CSU installed or for an external CSU such as an AT&T ESF T1 CSU, or *integrated* for the 120A1 CSU Module. Answering *integrated* will cause additional fields to be displayed for administering the Enhanced Integrated CSU Module. In addition to the above there are numerous other fields defining such parameters as framing modes, line coding companding mode and so on. For details, see *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653, and *DEFINITY Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT/ISDN-PRI Reference*, 555-025-107.

Hardware Error Log Entries and Test to Clear Values

DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS
1 (a)	0	Circuit pack removed or SAKI Test (#53)	MIN/WRN[2]	ON	
18 (b)	0	busy-out board PCSS	WARNING	OFF	release board PCSS
23 (c)	0		WARNING	OFF	add ds1 PCSS
125 (d)		None	MINOR	ON	
257	65535	Control Channel Loop Test (#52)	MINOR	ON	test board PCSS l r 20
257 (e)	Any	None			
513 (f)	Any		MINOR	ON	
769 (g)	4358				
1025 (e)	4363	NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	OFF	test board PCSS

Continued on next page

DS1 Interface Circuit Pack Maintenance Error Log Entries

1300 (h)	Any	Loss Of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1301 (i)	Any	Loss Of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1302 (j)	Any	Loss Of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	OFF	test board PCSS
1303 (k)	Any	Loss Of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	ON	test board PCSS
1310 (l)	Any	Board Loopback Test (#1209)	MINOR	ON	test ds1-loop PCSS ds1/csu-loopback-tests
1311 (m)	Any	Equipment Loopback Test (#1210)	MIN/WRN[3]	OFF	test ds1-loop PCSS ds1/csu-loopback-test
1312 (n)	Any	Repeater Loopback Test (#1211)	MIN/WRN[3]	OFF	test ds1-loop PCSS ds1/csu-loopback-tests
1313 (o)	Any	CPE Loopback Jack Test (#1212)	MIN/WRN[3]	OFF	test ds1-loop PCSS end-loopback/span-test
1314 (p)	Any	Far CSU Loopback Test (#1213)	MIN/WRN[3]	OFF	test ds1-loop PCSS end-loopback/span-test
1320	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	OFF	test board PCSS
1321	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	OFF	test board PCSS
1322	Any	Loss of Signal Alarm Inquiry Test (#138)	MINOR	ON	test board PCSS
1323	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN[3]	OFF	test board PCSS
1324	Any	Loss of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1538 (q)	Any		MINOR	ON	
1793	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN [4]	OFF	test board PCSS
1794	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN [4]	OFF	test board PCSS
1795	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN [4]	OFF	test board PCSS
2049	Any	Red Alarm Inquiry Test (#140)	MIN/WRN[3]	OFF	test board PCSS
2305	Any	Yellow Alarm Inquiry Test (#141)	MINOR	OFF	test board PCSS
2306	Any	Yellow Alarm Inquiry Test (#141)	MINOR	OFF	test board PCSS
2561	Any	Major Alarm Inquiry Test (#142)	MIN/WRN[3]	OFF	test board PCSS

Continued on next page

DS1 Interface Circuit Pack Maintenance Error Log Entries

2817		Minor Alarm Inquiry Test (#143)	MIN/WRN[3]	OFF	test board PCSS
3073 to 3160 (r)	Any	Slip Alarm Inquiry Test (#144)	MIN/WRN[3]	OFF	test board PCSS r 6
3329 to 3345 (s)	Any	Misframe Alarm Inquiry Test (#145)	MIN/WRN[3]	OFF	test board PCSS r 6
3840(t)	Any	None			
3900(u)	Any	CPE Loopback Jack Test (#1212)			
3901(v)	Any	Far CSU Loopback Test (#1213)			
3902(w)	Any	One-Way Span Test (#1214)			
3999 (x)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

3 Off-board minor alarms on this maintenance object (MO) may be downgraded to Warning alarms based on the values used in the **set options** command.

4 Major alarms on this MO may be downgraded to minor or warning alarms based on values set in the **set options** command.

Notes:

a. This error indicates that the circuit pack has stopped functioning or is not completely administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI Test (#53) fails.

To be completely administered, a DS1 circuit pack must meet all three of the following conditions:

1. Have an entry in the circuit plan via the **change circuit pack** command.
2. Be administered via the **add ds1 PCSS** command.
3. Be physically inserted in the appropriate slot.

If the circuit pack has an entry in the circuit plan, and either of the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error either

1. Make sure all conditions for administration are met and that a functioning DS1 circuit pack is inserted in the correct slot.

2. Completely remove the DS1-BD from the system using the following steps:

   a. Remove any administered DS1 trunks or access endpoints associated with the circuit pack from their trunk groups.

   b. Execute the **remove ds1** PCSS and **change circuit pack** PCSS commands.

If all the administration conditions are met for this circuit pack, and the red LED is still on, follow the instructions for ''LED Alarms with Error Type 1'' in Chapter 7, "LED Interpretation".

b. The DS1 Interface circuit pack has been busied out by a **busy-out board PCSS** command.

c. The DS1-BD circuit pack is not completely administered. A completely administered DS1-BD circuit pack should have an entry in the circuit plan via the **change circuit pack** command, should have been administered via the **add ds1 PCSS** command, and should have been inserted into the appropriate port slot.

d. The circuit pack in the slot does not match the type administered to that position. Either replace the circuit pack with one of the type administered, or use **change circuit-pack** to readminister the slot. This error may also indicate that the 24/32-channel selection on the DS1 administration form does not match the configuration of the circuit pack.

e. This error is associated with the Common Port Circuit Pack Maintenance Test. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for details.

f. The DS1 Interface circuit pack has detected a transient hardware problem (for example, external RAM failure, internal RAM failure, internal ROM failure, or instruction set failure). This error will disappear when no faults are detected for 30 minutes. The value in the Aux Data field indicates the type of hardware problem. However, when this error is reported with Aux Data in the range of 4352 to 4358, it indicates the circuit pack has reported a hardware failure such that the circuit pack should be replaced.

g. The DS1 Interface circuit pack has detected a transient hardware logic error (for example, program logic inconsistency). This error will disappear when no faults are detected for 100 minutes. The value in Aux Data field indicates the type of hardware problem.

h. CSU Module missing. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the 120A1 CSU Module is not physically connected (or is improperly connected) to the TN767E board on the back of the port carrier.

   If using the 120A1 CSU Module, plug (or replug) the CSU Module into the TN767E circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the *Near-End CSU Type* field using the *change ds1* form to *other*.

If this error remains after plugging the CSU Module into the board's connector, there could be a problem with the I/O connector panel.

i. CSU Module not expected. The 120A1 CSU Module is physically connected to the TN767E board on the back of the port carrier but the *Near-End CSU Type* field on the *add ds1* form has not been administered as *integrated*.

   If the 120A1 CSU Module is to be used, use the *change ds1* command to change the *Near-End CSU Type* field to *integrated*. Otherwise, physically remove the 120A1 CSU Module from the back of the port carrier.

j. DS1 configuration error. Attempting to use the 120A1 CSU Module with a TN767E circuit pack that is configured for 32-channel (2.048 Mbps) operation. The CSU Module only works with a DS1 board configured for 24-channel (1.544 Mbps) operation in the United States of America.

k. DS1 circuit pack suffix incorrect for CSU Module. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated*, but the DS1 circuit pack is not a TN767E or later suffix DS1 board.

   If the 120A1 CSU Module is to be used, remove the circuit pack and replace it with a TN767E or later suffix board. Otherwise, use the *change ds1* command to change the *Near-End CSU Type* field to *other*.

l. BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using the following commands: *busyout board PCSS*, *test ds1-loop PCSS ds1/csu-loopback-tests*, and *release board PCSS*. If the BLB test continues to fail, then the TN767E circuit pack needs to be replaced.

m. ELB failure. This error occurs when the Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test fails. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN767E board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS ds1/csu-loopback-tests*, and *release board PCSS*. If the ELB test continues to fail, then either the TN767E board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate where the failure is occurring by reexecuting the test by replacing one piece of hardware at a time.

n. RLB failure. This error occurs when the Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test fails. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN767E board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*.

Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS ds1/csu-loopback-tests*, and *release board PCSS*. If the RLB test continues to fail, then the CSU Module needs to be replaced.

o. CPE Loopback Jack deactivation error. This error occurs when the TN767E circuit pack could not deactivate a CPE Loopback Jack loopback on power-up/reset or upon software request.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS end-loopback/span-test*, and *release board PCSS*. If the attempt to deactivate the CPE Loopback Jack loopback continues to fail, other steps must be taken to deactivate the loopback.

p. Far CSU Loopback deactivation error. This error occurs when the TN767E circuit pack could not deactivate a far-end CSU loopback on power-up/reset or upon software request.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS end-loopback/span-test*, and *release board PCSS*. If the attempt to deactivate the Far CSU loopback continues to fail, then escalate the problem.

q. The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The common circuit pack level tests such as Test #51 and/or Test #220 are aborting with error code 2000.
   2. The tests run on the ports of this circuit pack are returning NO BOARD.
   3. A busy-out/release of the circuit pack has no affect on test results.
   4. A **list configuration** command shows that the circuit pack and ports are properly installed.

   The circuit pack is isolated from the system and all trunks of this circuit pack are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 Interface circuit pack is restored to normal operation. All trunks of the DS1 Interface circuit pack are then returned to the in-service state. If the error recurs after 15 minutes, then replace the circuit pack (refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures").

r. For later releases of G3V4 and beyond, only error 3073 will show that this board is receiving Slips and the AUX data shows the last Slip count that was reported.

s. For later releases of G3V4 and beyond, only error 3329 will show that this board is receiving misframes and the AUX data shows the last misframe count that was reported.

t. This error is not service-affecting and can be ignored.

u. Error 3900 is used to give status information on a CPE Loopback Jack Test. The value in the Aux Data field indicates the status of the loopback test.

1 — Test is currently running.

2 — Test failed because loopback could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been terminated.

v. Error 3901 is used to give status information on a Far CSU Loopback Test. The value in the Aux Data field indicates the status of the loopback test.

1 — Test is currently running.

2 — Test failed because loopback could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been terminated.

w. Error 3902 is used to give status information on a One-Way Span Test. The value in the Aux Data field indicates the status of the span test.

1 — Test is currently running.

2 — Test failed because loopback could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been terminated.

x. Error type 3999 indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Connection Audit Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
NPE Connection Audit Test (#50)		X			ND
Control Channel Loop Test (#52)		X			ND
Loss of Signal Alarm Inquiry	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND
Misframe Alarm Inquiry Test (#145)	X	X			ND
Translation Update Test (#146)	X	X			ND
ICSU Status LEDs Test (#1227)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Loop Around Test (#135)			X		D
DS1/CSU Loopback Tests					
DS1 Board Loopback Test (#1209)				X	D
CSU Equipment Loopback Test (#1210)				X	D
CSU Repeater Loopback Test (#1211)				X	D
CPE Loopback Jack Test (#1212)				X	D
Far CSU Loopback Test (#1213)				X	D
One-Way Span Test (#1214)				X	D
Inject Single Bit Error (#1215)				X	D
End Loopback/Span Test (#1216)				X	D

1 D = Destructive; ND = Nondestructive

NPE Connection Audit Test (#50)

The system sends a message to the on-board microprocessor to update the network connectivity translation for all the Network Processing Elements (NPEs) on the circuit pack.

Table 11-116. TEST #50 NPE Connection Audit Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available.
1019	ABORT	Test already in progress.
	FAIL	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort/fail, escalate the problem.
	PASS	The circuit pack's NPEs have been updated with their translation.

Continued on next page

Table 11-116. TEST #50 NPE Connection Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Control Channel Loop Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 11-117. TEST #52 Control Channel Loop Around Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-117. TEST #52 Control Channel Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The test failed because the circuit pack did not return the circuit pack code or vintage. **NOTE:** Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as Test 138 and Test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test result. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack. 1. Retry the command for a maximum of 5 times. 2. If the problem continues, check for hyperactivity. Resolve the problem, as appropriate. 3. If there is no longer hyperactivity, retry the command for a maximum of 5 times. 4. If the test continues to fail, replace the circuit pack. 5. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-117. TEST #52 Control Channel Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Communication with this circuit pack is successful.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

SAKI Sanity Test (#53)

This test is destructive.

This test resets the circuit pack.

Table 11-118. TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Wrong circuit pack configuration to run this test. This error applies only to DS1 Interface circuit packs. It means the DS1 Interface circuit pack is providing timing for the system and, therefore, it cannot be reset without major system disruptions. 1. If the circuit pack needs to be reset, then set synchronization to another DS1 Interface circuit pack or to the Tone-Clock circuit pack and try again. Refer to SYNC (Synchronization) Maintenance documentation.
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack. 2. Execute the command again.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. 1. Execute the command again. 2. If the problem persists, replace the circuit pack.

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Table 11-118. TEST #53 SAKI Sanity Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The circuit pack initializes correctly. 1. Run the Short Test Sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Internal Loop Around Test (#135)

This test is destructive.

The Internal Loop Around Test is run by looping the transmitted DS1 bit stream back into the DS1's board receiver. The loop occurs just before the DS1 facility interface. The test is highly destructive and can only be initiated by a system technician-demanded **reset board PCSS** command.

All trunks on the DS1 Interface circuit pack must be busied out via the system technician **busy-out board** command before running the Internal Loop Around Test. When the Internal Loop Around Test is initiated, maintenance software sends appropriate messages to the DS1 Interface circuit pack to start the test. The test uses the Tone Generator and Tone Detector to exercise a bit pattern consistency test for all ports. If the transmitted and received bit patterns on a trunk are different, the test fails.

When the test is complete, the maintenance software sends a stop loop around message to the DS1 Interface circuit pack to put the circuit pack back into the normal operation mode. All trunks of the DS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-119. TEST #135 Internal Loop Around Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-119. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	Received an incoming call on a port of the DS1 circuit pack during the test. 1. Enter the **busy-out board PCSS** command to put all trunks of DS1 Interface circuit pack to out-of-service state. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on DS1 Interface circuit pack have not been busied out. 1. Enter the **busy-out board PCSS** command to put all trunks of the DS1 Interface circuit pack into out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.

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Table 11-119. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Therefore, it cannot be reset without major system disruption. 1. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: ■ Issue the **disable synchronization-switch** command. ■ Next, issue the **set synchronization PCSS** command. ■ Lastly, issue the **enable synchronization-switch** command.

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Table 11-119. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	The test was aborted. Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as Test 139 and Test 140) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-119. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	DS1 Interface circuit pack failed in the Internal Loop Around Test. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the DS1 Interface circuit pack is TN767, enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. Otherwise, skip this step. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the physical connectivity of DS1 Interface circuit packs and cable. 5. If all of the above are OK, replace the local DS1 Interface circuit pack and repeat the test. 6. Contact T1 Network Service to diagnose the remote DS1 endpoint. 7. If the test still fails, then escalate the problem.
	PASS	All administered trunks of DS1 Interface circuit pack pass the Internal Loop Around Test. The bit pattern consistency test is executed successfully over the path that covers a DS1 port, cable, and the external NCTE device.

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Table 11-119. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Loss of Signal Alarm Inquiry Test (#138)

This test verifies the synchronization status and continuity of the DS1 link. The Loss of Signal alarm indicates that the DS1 Interface circuit pack is unable to derive the synchronization clock from the DS1 facility. When the DS1 Interface circuit pack detects a Loss of Signal alarm, it stops providing the synchronization clock for the system if it is administered as a timing source and transmits a Yellow alarm to the remote DS1 endpoint.

When the Loss of Signal alarm is confirmed, the maintenance software places all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored.

The DS1 Interface circuit pack raises a Loss of Signal alarm after the signal has been lost for about 3 seconds. It will not retire the alarm until the signal has returned for about 16 seconds.

This test is also used to maintain the new AT&T 120A1 CSU Module. This CSU Module, when combined with the functionality provided by the TN767E circuit pack, provides functionality equivalent to an external stand-alone AT&T ESF T1 CSU. The combination of the TN767E and 120A1 CSU Module is known as an Enhanced Integrated CSU (I-CSU).

If a TN767E circuit pack detects certain I-CSU hardware errors, it will notify maintenance. When the maintenance subsystem receives notification of the I-CSU error, it will execute this Loss of Signal Inquiry test. The test, in addition to querying for a Loss Of Signal alarm condition, will also query the TN767E board to confirm the I-CSU error. A Minor or Warning alarm will be raised depending on the severity of the I-CSU error. The trunks on the board may be taken out of service if the I-CSU error is deemed serious.

If a Loss Of Signal alarm and an I-CSU error co-exist, the Loss Of Signal alarm condition will take priority, and the board and all trunks on the board will be put in the out-of-service state. Errors will be logged, however, for both.

When the maintenance subsystem receives notification that the I-CSU hardware error condition no longer exists, maintenance will restore the board and all trunks to their previous service state if the alarm can be cleared (no other I-CSU errors or Loss Of Signal alarm exist).

Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	DS1 Interface circuit pack detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. All trunks or ports of this DS1 interface circuit pack are out-of-service. If the DS1 Interface circuit pack is designated as the supplier of the system synchronization source, then the system synchronization maintenance will adopt a source elsewhere. Refer to the SYNC section in this chapter for details. 1. If the DS1 Interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 Interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 2. Check the physical connection of the DS1 Interface circuit pack and the cable. If a 120A1 CSU Module is physically connected to a TN767E board on the back of the port carrier, check the physical connection of the CSU Module and make sure the Network Interface cable is plugged into the CSU Module's NETWORK jack.
1300	FAIL	The CSU Module is missing. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the 120A1 CSU Module is not physically connected to the TN767E board on the back of the port carrier. 1. If using the 120A1 CSU Module, plug the CSU Module into the TN767E circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the *Near-End CSU Type* field using the *change ds1* to *other.* 2. Run the test again.

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1301	FAIL	The 120A1 CSU Module is physically connected to the TN767E board on the back of the port carrier but the *Near-End CSU Type* field on the *add ds1* form has not been administered as *integrated*. 1. If the 120A1 CSU Module is to be used, use the *change ds1* command to change the *Near-End CSU Type* field to *integrated*. Otherwise, physically remove the 120A1 CSU Module from the back of the port carrier. 2. Run the test again.
1302	FAIL	Attempting to use the 120A1 CSU Module with a TN767E circuit pack that is configured for 32-channel (2.048 Mbps) operation. The CSU Module only works with a DS1 board configured for 24-channel (1.544 Mbps) operation in the United States of America. 1. If the 120A1 CSU Module is to be used, physically remove the TN767E circuit pack and reconfigure for 24-channel (1.544 Mbps) operation. 2. Reinsert the circuit pack and run the test again.
1303	FAIL	The DS1 circuit pack Suffix is incorrect for CSU Module administration. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the DS1 circuit pack is not a TN767E or later suffix DS1 board. 1. If the CSU Module is to be used, and the *Near-End CSU Type* field is set to *integrated* to allow for CSU administration, remove the circuit pack and replace it with a TN767E or later suffix board. Otherwise, use the *change ds1* command to change the *Near-End CSU Type* field to *other*.
1310	FAIL	The DS1 Board Loopback (BLB) demand test (#1209) failed. 1. Repeat the test using the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the BLB test continues to fail, then replace the TN767E circuit pack. 3. Run this test again.

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1311	FAIL	The Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test (#1210) failed. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN767E board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*. 1. Execute the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the ELB test continues to fail, then either the TN767E board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Begin by replacing the CSU Module and running the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 3. If the ELB test continues to fail, then replace the TN767E board and run the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 4. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module.
1312	FAIL	The Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test (#1211) failed. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN767E board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*. 1. Execute the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the RLB test continues to fail, then replace the CSU Module. 3. Run this test again.

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1313	FAIL	The TN767E circuit pack could not deactivate a CPE Loopback Jack loopback. 1. Execute the *test ds1-loop PCSS end-loopback/span-test* command. 2. If the attempt to deactivate the CPE Loopback Jack loopback is not successful, check the cabling and investigate the problem at the CPE Loopback Jack. 3. Run the test again.
1314	FAIL	The TN767E circuit pack could not deactivate a far-end CSU loopback. 1. Execute the *test ds1-loop PCSS end-loopback/span-test* command. 2. If the attempt to deactivate the far-end CSU loopback continues to fail, then escalate the problem.
1320	FAIL	A 120A1 CSU module hardware failure or an ICSU serial interface audit failure was detected by the TN767E DS1 circuit pack. 1. Replace the CSU module, and then run the test again. 2. If the test continues to fail with this error code, replace the TN767E and run the test again. 3. If the test continues to fail with this error code, then the problem could be in the I/O cable between the backplane and the CSU module..

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1321	FAIL	DTE LOS (loss of signal) was detected between the TN767E DS1 board and the 120A1 CSU Module. Either the TN767E board, the 120A1 CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. 1. Replace the CSU Module and run the test again. 2. If the test continues to fail with this error code, then replace the TN767E board and run the test again. 3. If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module.
1322	FAIL	No 5 volts power detected from the TN767E circuit pack to the 120A1 CSU Module. Problem probably due to an open fuse on the DS1 board. 1. Remove the TN767E from the system and reinsert. 2. Run the test again once the board has finished its reset. 3. If the test continues to fail with this error code, then replace the CSU Module and run the test again. 4. If the test continues to fail with this error code, then replace the TN767E board and run the test again. 5. If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module.
1323	FAIL	A service affecting CSU Module audit failure was detected by the TN767E DS1 circuit pack. All administered ports on the DS1 circuit pack are affected and maintenance software will place the ports into the out-of-service state. 1. Replace the 120A1 CSU Module.

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Table 11-120. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1324	FAIL	A non-service affecting CSU Module audit failure was detected by the TN767E DS1 circuit pack. No ports should be affected. No immediate action is required. These errors indicate that the CSU Module hardware may have a problem, and that it should be replaced when practical to avoid further deterioration.
	PASS	DS1 signal is present and the physical link is healthy. In addition, no Integrated CSU errors are detected.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Blue Alarm Inquiry Test (#139)

The Blue Alarm is a signal sent by the remote DS1 endpoint when it is out-of-service. The Blue Alarm Inquiry Test checks the blue alarm status of the remote DS1 endpoint.

When the DS1 Interface circuit pack detects a Blue Alarm signal from the remote DS1 endpoint, the circuit pack will transmit a Yellow alarm to the remote DS1 endpoint and send a BLUE ALARM message to the maintenance software. When the Blue alarm is confirmed, the maintenance software places all trunks of the DS1 Interface circuit pack into the out-of-service state. The inquiry test will be run every 10 minutes until the Blue alarm is cleared.

The DS1 Interface circuit pack takes 2 seconds to recognize and report a Blue alarm and 16 seconds to recognize and report the resolution of a Blue alarm. When the Blue alarm is cleared, the DS1 Interface circuit pack stops transmitting the Yellow alarm and places the trunks back into the service state before the Blue alarm occurs.

Line Loopback Alarm

The Line Loopback (LLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. When the switch DS1 is in the LLB mode, the arriving bit pattern is regenerated and sent back. Line Loopback (LLB) Alarm is activated when the in-band activate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line. LLB is deactivated when the in-band deactivate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line.

Since LLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Payload Loopback Alarm

The Payload Loopback (PLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. PLB Alarm is activated when a network protocol activate bit pattern arrives over the 4Kbps ESF data link on the DS1 line. PLB is deactivated when a network protocol deactivate bit pattern arrives over the 4Kbps ESF data link on the DS1 line.

Since PLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Table 11-121. TEST #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-121. TEST #139 Blue Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The remote DS1 endpoint is out-of-service. 1. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote endpoint. 2. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint.
1794	FAIL	The DS1 Interface circuit pack detects a Line Loopback Alarm (LLB). 1. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. 2. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. If the DS1 interface circuit pack connects directly to a line-side terminating device (for example, a PRI terminal adapter), call the vendor of the terminating device to diagnose the equipment.
1795	FAIL	The DS1 Interface circuit pack detects a Payload Loopback Alarm (PLB). If the DS1 Interface circuit pack connects to a leased T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 Interface circuit pack connects directly to another DS1 board, call the system technician of the remote switch to diagnose the DS1 endpoint.
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback alarm is detected in the DS1 Interface circuit pack.

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Table 11-121. TEST #139 Blue Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Red Alarm Inquiry Test (#140)

DS1 Interface circuit pack raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry Test checks the framing status of a DS1 Interface circuit pack. DS1 Interface circuit pack takes 3 seconds to recognize and report a Red alarm and 12 seconds to recognize and report the resolution of a Red alarm.

When the DS1 Interface circuit pack detects a Red alarm, the circuit pack will transmit a Yellow alarm to the remote DS1 endpoint and send a RED ALARM message to the maintenance software. After the Red alarm is confirmed, the maintenance software places all trunks of the circuit pack into the out-of-service state. The inquiry test will be run every 10 minutes until the Red alarm is cleared.

When the Red alarm is cleared, the DS1 Interface circuit pack will stop transmitting the Yellow alarm to the remote DS1 endpoint. The maintenance software restores all trunks of the DS1 Interface circuit pack to the service state before the Red alarm occurs.

Loss of Multiframe Alarm: If the DS1 Interface circuit pack is administered using DMI-BOS signaling, the DS1 Interface circuit pack raises a Loss of Multiframe Alarm (LMA) when it cannot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24th channel. Once DS1 Interface circuit pack detects an LMA, the circuit pack will transmit a Remote Multiframe Alarm (RMA) to the remote DS1 endpoint. Maintenance software handles both Red alarm and LMA alarm(s) using the same mechanism.

Table 11-122. TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-122. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-122. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The DS1 Interface circuit pack detects a Red alarm. An out-of-frame condition occurs on the DS1 Interface circuit pack. DS1 Interface circuit pack will transmit a Yellow alarm to the remote DS1 endpoint until the Red alarm is retired. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSU's are administered correctly. 2. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. Check the physical connectivity of the DS1 pack and of the cable. 4. Replace the local DS1 interface circuit pack, and repeat the test. 5. If the test continues to fail, escalate the problem.

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Table 11-122. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The DS1 interface circuit pack detected a loss of multiframe alarm (LMA). An out of frame condition occurred on the DS1 interface circuit pack. The DS1 interface circuit pack will transmit a remote multiframe alarm (RMA) to the remote DS1 endpoint until the LMA is retired. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSU's are administered correctly. 2. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. Check the physical connectivity of the DS1 pack and of the cable. 4. Replace the local DS1 interface circuit pack, and repeat the test. 5. If the test continues to fail, escalate the problem.
	PASS	No Red alarm is detected on DS1 Interface circuit pack.

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Table 11-122. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Yellow Alarm Inquiry Test (#141)

Receiving a Yellow alarm from remote DS1 endpoint indicates that the remote DS1 endpoint has an out-of-frame condition. The Yellow Alarm Inquiry Test is used to determine whether the remote DS1 endpoint is transmitting a Yellow alarm. The DS1 Interface circuit pack takes 500 msec to recognize and report a Yellow alarm and 500 msec to recognize and report that a Yellow alarm condition is cleared.

When the DS1 Interface circuit pack detects a Yellow alarm from the remote DS1 endpoint, it will send a YELLOW-ALARM uplink message to the maintenance software. After the maintenance software receives the YELLOW-ALARM message, the Yellow Alarm Inquiry Test is run to confirm the Yellow alarm. Once the Yellow alarm is confirmed, the maintenance software places all trunks on the circuit pack into the out-of-service state. The Inquiry Test will be run every 10 minutes until the Yellow alarm is cleared.

When the Yellow alarm is cleared, the maintenance software restores all trunks on the DS1 Interface circuit pack back to their previous service state before the Yellow alarm is raised.

This Yellow Alarm corresponds to the yellow F2 state documented in CCITT recommendation I.431.

Remote Multiframe Alarm: Remote Multiframe Alarm (RMA) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition, while the DS1 Interface circuit pack is administered using the DMI-BOS common channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 State Alarm: For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

Table 11-123. TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	ICould not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-123. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-123. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The DS1 interface circuit pack detected a yellow alarm sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSU's are administered correctly. 2. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. Check the physical connectivity of the DS1 pack and of the cable. 4. Replace the local DS1 interface circuit pack, and repeat the test. 5. If the test continues to fail, escalate the problem.

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Table 11-123. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The DS1 Interface circuit pack detects a Remote Multiframe Alarm sent by the remote DS1 endpoint. An out-of-frame condition occurs on the remote DS1 endpoint. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSU's are administered correctly. 2. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. Check the physical connectivity of the DS1 pack and of the cable. 4. Replace the local DS1 interface circuit pack, and repeat the test. 5. If the test continues to fail, escalate the problem.

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Table 11-123. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The DS1 Interface circuit pack is reporting a yellow F5 State alarm. There is a fault in the user-network interface from the user (PBX) to the network. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSU's are administered correctly. 2. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 3. Check the physical connectivity of the DS1 pack and of the cable. 4. Replace the local DS1 interface circuit pack, and repeat the test. 5. If the test continues to fail, escalate the problem.
	PASS	No Yellow alarm nor Remote Multiframe Alarm nor F5 State Alarm is received from the remote DS1 endpoint.

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Table 11-123. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Major Alarm Inquiry Test (#142)

The Major alarm raised by a DS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1000. The Major Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1000. When D4 framing mode is selected, the DS1 Interface circuit pack takes 16 seconds to recognize and report a Major alarm and 16 seconds to recognize and report that a Major alarm condition is cleared. If ESF framing mode is selected, the DS1 Interface circuit pack takes 10 seconds to recognize and report a Major alarm and 10 seconds to recognize and report that a Major alarm condition is cleared.

When the DS1 Interface circuit pack detects a Major alarm, it will send a MAJOR-ALARM message to the maintenance software. After the maintenance software receives a MAJOR-ALARM message, the Major Alarm Inquiry Test is initiated to confirm the Major alarm on the DS1 Interface circuit pack. The Inquiry Test will be run every 10 minutes until the Major alarm is cleared. The maintenance software places all trunks on the circuit pack in the out-of-service state if the Major alarm persists for more than 20 minutes.

When the Major alarm is cleared, the maintenance software restores all trunks on the circuit pack to their previous service state before a Major alarm occurs.

Table 11-124. TEST #142 Major Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-124. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-124. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The DS1 Interface circuit pack detects a Major alarm. The DS1 bit error rate is greater than 1/1000. 1. The performance of DS1 link between DS1 Interface circuit pack and remote DS1 endpoint is very poor. If the DS1 Interface circuit pack is TN767, enter **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 3. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 4. Check the physical connectivity of the DS1 pack and of the cable. 5. Replace the local DS1 interface circuit pack, and repeat the test. 6. If the test continues to fail, escalate the problem.
	PASS	No Major alarm is detected in DS1 Interface circuit pack.

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Table 11-124. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Minor Alarm Inquiry Test (#143)

The Minor alarm raised by a DS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1,000,000, but less than 1/1000. The Minor Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. When D4 framing mode is selected, the DS1 Interface circuit pack takes 41 minutes to recognize and report a Minor alarm and 41 minutes to recognize and report that a Minor alarm condition is cleared. If ESF framing mode is selected, the DS1 Interface circuit pack takes 10 minutes to recognize and report a Minor alarm and 10 minutes to recognize and report that a Minor alarm condition is cleared.

When the DS1 Interface circuit pack detects a Minor alarm condition, it will send a MINOR-ALARM message to the maintenance software. After the maintenance software receives a MINOR-ALARM message, the Minor Alarm Inquiry Test is initiated to confirm the Minor alarm. All trunks on the circuit pack are kept in the in-service state after the Minor alarm is confirmed. The Minor Alarm Inquiry Test is run every 10 minutes until the Minor alarm is cleared.

Table 11-125. TEST #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-125. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-125. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The DS1 Interface circuit pack detects a Minor alarm. The DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. 1. The performance of DS1 link between DS1 Interface circuit pack and remote DS1 endpoint is poor. If DS1 Interface circuit pack is TN767, enter **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 3. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 4. Check the physical connectivity of the DS1 pack and of the cable. 5. Replace the local DS1 interface circuit pack, and repeat the test. 6. If the test continues to fail, escalate the problem.
	PASS	No Minor alarm is detected in DS1 Interface circuit pack.

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Table 11-125. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Slip Alarm Inquiry Test (144)

Slips occur when transmitter and receiver are not running at precisely the same clock rate. The DS1 Interface circuit pack can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry Test is used to acquire the total number of slips occurred on a DS1 link.

When the DS1 Interface circuit pack detects a slip condition, the circuit pack will increase the on-board slip counter by 1. A SLIP-COUNT message is spontaneously sent to the system software after the counter reaches a threshold (for example, 88). When the maintenance software receives the SLIP-COUNT message, the Slip Alarm Inquiry Test is initiated to query the slip counters on DS1 Interface circuit pack and total the slip counts in the maintenance software.

If the count of slips is over the threshold, a Minor alarm is raised against the DS1 Interface circuit pack. All trunks of the DS1 Interface circuit pack are still in the in-service state. If the DS1 Interface circuit pack is used to supply the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See TDM-BUS (TDM Bus) and SYNC (Synchronization) Maintenance documentation for details.

Table 11-126. TEST #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-126. TEST #144 Slip Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-126. TEST #144 Slip Alarm Inquiry Test — *Continued*

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description/ Recommendation</th></tr>
<tr><td>1 to 88</td><td>FAIL</td><td>The DS1 interface circuit pack detected a slip alarm. The error code equals the number of slips detected by the DS1 interface circuit pack since the last slip alarm inquiry test.
1. Retry the command at 1 minute intervals for a maximum of 5 times.
2. If the DS1 interface circuit pack is a TN767, enter the list measurement ds1-log PCSS command to read the error seconds measurement.
3. Verify that both endpoints and all intermediate equipment of the DS1 link are administered using the same signaling mode, framing mode, and line coding.
4. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint.
5. Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors.
6. Check the physical connectivity of the DS1 pack and of the cable.
7. Replace the local DS1 interface circuit pack, and repeat the test.
8. If the test continues to fail, escalate the problem.</td></tr>
<tr><td></td><td>PASS</td><td>No Slip alarm is detected on the DS1 Interface circuit pack.</td></tr>
</table>

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Table 11-126. TEST #144 Slip Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Misframe Alarm Inquiry Test (#145)

Misframe Alarm indicates that framing bits observed on a DS1 Interface circuit pack are in error. Misframe Alarm Inquiry Test queries the total number of misframes that have occurred on a DS1 Interface circuit pack since the last inquiry.

When the DS1 Interface circuit pack detects a misframe error, it will increase its misframe counter by 1. If the counter reaches the threshold, a MISFRAME-COUNT message is automatically sent to the switch maintenance software. After the maintenance software receives the MISFRAME-COUNT message, the Misframe Alarm Inquiry Test is initiated to collect the misframe counts from the DS1 Interface circuit pack.

When the threshold of misframes is reached, if the DS1 Interface circuit pack is supplying the system synchronization source, then a switching synchronization source message is sent to the TDM Bus Clock. See TDM-BUS (TDM Bus) Maintenance documentation for details. A Minor alarm against the DS1 Interface circuit pack is raised, but all trunks of the DS1 Interface circuit pack are still in the in-service state.

Table 11-127. TEST #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-127. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-127. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	The test failed because the DS1 interface circuit pack detected errors in the received framing bits pattern. The error code equals the number of misframes detected by the DS1 interface circuit pack since the last misframe alarm inquiry test. Major bit and minor bit error rate (error types 2561 and 2817) error logs often accompany misframe alarms. Clearing the cause of these error logs may clear the misframes which are occurring. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the DS1 interface circuit pack is a TN767, enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that both endpoints and all intermediate equipment of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. 5. Check the physical connectivity of the DS1 pack and of the cable. 6. Replace the local DS1 interface circuit pack, and repeat the test. 7. If the test continues to fail, escalate the problem.
	PASS	No Misframe alarm is detected on the DS1 Interface circuit pack.

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Table 11-127. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Translation Update Test (#146)

The Translation Update Test sends the circuit-pack-level information specified by System Administration to the DS1 Interface circuit pack. Translation includes the following data administered for a DS1 Interface circuit pack (see output of **display ds1 PCSS** command): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, Time Slot Number of 697-Hz Tone, Time Slot Number of 700-Hz Tone, etc.

In G3V3, if a TN767E or later DS1 circuit pack is combined with an AT&T 120A1 CSU Module to form and Integrated CSU Module, this test will also send the administration for this Integrated CSU to the circuit pack to assure the board's translations are correct. The administration of the CSU Module is done using the DS1 circuit pack administration form. Translation for the CSU Module includes the following data: Transmit LBO, Receive ALBO, Supply CPE Loopback Jack Power?, etc.

Table 11-128. TEST #146 Translation Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal system software error. 1. Enter the **display ds1 PCSS** command to verify the DS1 Interface circuit pack translation. 2. If the test continues to fail, escalate the problem.
	PASS	Translation data has been downloaded to the DS1 Interface circuit pack successfully.

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Table 11-128. TEST #146 Translation Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

DS1 Board Loopback Test (#1209)

This test is destructive.

The DS1 Board Loopback (BLB) Test causes a loopback at the TN767E DS1 board edge and tests DS1 board internal circuitry.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the BLB Test.

When the BLB Test is initiated, maintenance software sends an appropriate message to the TN767E DS1 Interface circuit pack to start the test. The board will set up the BLB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

When the test is complete, all trunks or ports on the TN767E DS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-129. TEST #1209 DS1 Board Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	DS1 Board Loopback Test cannot be executed in the current configuration. To run this Test, the TN767E or later suffix DS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.

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Table 11-129. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span tests can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.

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Table 11-129. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-129. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	DS1 Interface circuit pack failed the DS1 Board Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the BLB test continues to fail, then replace the DS1 circuit pack.
	PASS	The BLB test executed successfully. The test pattern was transmitted and received successfully up to the TN767E DS1 board edge.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

CSU Equipment Loopback Test (#1210)

This test is destructive.

The CSU Equipment Loopback (ELB) Test causes a loopback at the near-edge of the local AT&T 120A CSU Module and tests the connection from the TN767E DS1 board to the CSU Module (DS1 board edge, connection, and CSU Module edge). This test will only be performed if the AT&T 120A CSU Module is present, administered, and connected to a 1.544Mbps TN767E DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the ELB Test.

When the ELB Test is initiated, maintenance software sends an appropriate message to the TN767E DS1 Interface circuit pack to start the test. The board will set up the ELB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

In addition, the DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loopback pattern.

When the test is complete, all trunks or ports on the TN767E DS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-130. TEST #1210 CSU Equipment Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	CSU Equipment Loopback Test cannot be executed in the current configuration. To run this test, the *Near-End CSU Type* field on the DS1 circuit pack administration form must be set to *integrated*, and the "Bit Rate" field must be set to "1.544" (24-channel operation). 1. Use the **change ds1 PCSS** command to set the *Near-End CSU Type* field on the DS1 circuit pack administration form to *integrated*, and/or change the "Bit Rate" field to "1.544" if the board is to be used in 24-channel configuration. 2. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 3. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.

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Table 11-130. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
1951	ABORT	The CSU Equipment Loopback Test could not be executed because the 120A1 CSU Module was not physically installed. Physically connect the 120A1 CSU Module to the TN767E board on the back of the port carrier.

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Table 11-130. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-130. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	DS1 Interface circuit pack failed the CSU Equipment Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the ELB test continues to fail, then either the TN767E board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Begin by replacing the CSU Module and running the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 3. If the ELB test continues to fail, then replace the TN767E board and run the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 4. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module.

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Table 11-130. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The ELB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN767E DS1 board to the near-edge of the 120A1 CSU Module.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

CSU Repeater Loopback Test (#1211)

This test is destructive.

The CSU Repeater Loopback (RLB) Test causes a loopback at the far-edge of the AT&T 120A1 CSU Module and tests the connection from the TN767E DS1 board to and including the CSU Module circuitry. This test will only be performed if the AT&T 120A1 CSU Module is present, administered, and connected to a 1.544 Mbps TN767E DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the RLB Test.

When the RLB Test is initiated, maintenance software sends an appropriate message to the TN767E DS1 Interface circuit pack to start the test. The board will set up the RLB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

In addition, the DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loopback pattern itself.

When the test is complete, all trunks or ports on the TN767E DS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-131. TEST #1211 CSU Repeater Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-131. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	CSU Repeater Loopback Test cannot be executed in the current configuration. To run this test, the *Near-End CSU Type* field on the DS1circuit pack administration form must be set to *integrated* and the "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" (24-channel configuration). 1. Use the **change ds1 PCSS** command to set the *Near-End CSU Type* field on the DS1 circuit pack administration form to *integrated*, and/or change "Bit Rate" field to "1.544" if the board is to be used in 24-channel configuration. 2. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 3. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-131. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
1951	ABORT	The CSU Repeater Loopback Test could not be executed because the 120A1 CSU Module was not physically installed. Physically connect the 120A1 CSU Module to the TN767E board on the back of the port carrier.
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-131. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
	FAIL	DS1 Interface circuit pack failed the CSU Repeater Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command 2. If the RLB test continues to fail, and the CSU Equipment Loopback Test (#1210) passed, then replace the CSU Module.

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Table 11-131. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The RLB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN767E DS1 board to the far-edge of the 120A1 CSU Module.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

CPE Loopback Jack Test (#1212)

This test is destructive.

The CPE Loopback Jack (CLJ-LB) Test causes a loopback at the CPE Loopback Jack and tests the building wiring connection between the TN767E DS1 board and the CPE Loopback Jack.

The test is highly destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS cpe-loopback-jack-test-begin [number-of-bits bit-pattern]* command. The System Technician has the choice of entering a loopback activation code on the command line or using the default code (0X47F).

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the CPE Loopback Jack Test.

The CPE Loopback Test has the TN767E DS1 Interface circuit pack transmit a loopback activation code to the CPE Loopback Jack, waits up to 10 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result to indicate that the pattern was successfully sent. If the loopback is not established within the 10 seconds, the test returns FAIL.

The status of the CPE Loopback test will be available in the hardware error log via error type 3900. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and the number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of loopback/span test executing (*Test* field), the type of pattern generated for the loopback/span test (*Pattern* field), and whether the pattern (i.e., *3-in-24 Pattern*) is synchronized (*Synchronized* field).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 11-132. TEST #1212 CPE Loopback Jack Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the *test ds1-loop PCSS cpe-loopback-jack-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	CPE Loopback Jack Test cannot be executed in the current configuration. To run this test, the TN767E or later suffix DS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-132. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-132. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-132. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The CLJ-LB test failed because it was not set up properly. The DS1 interface pack could not successfully put the CPE loopback jack into loopback mode. 1. Rerun the **test ds1-loop PCSS cpe-loopback-jack-test-begin** command. 2. If the test continues to fail, the problem could be with the TN767E board, the CPE loopback jack equipment, or somewhere between. Run the **test ds1-loop PCSS ds1/csu-loopback-tests** command to determine if the loopback tests that are closer to the TN767E board are successful. If any of these tests fail, follow the maintenance strategy that is associated with the test that fails; otherwise, escalate the problem.
3	FAIL	The CPE Loopback Jack Test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the CPE Loopback Jack, could not be detected properly by the DS1 circuit pack. 1. Retry the *test ds1-loop PCSS cpe-loopback-jack-test-begin* command. 2. If the CSJ Loopback test continues to fail, the problem could be with the TN767E board, the CPE Loopback Jack equipment, or somewhere in between. Run the *test ds1-loop PCSS ds1/csu-loopback-tests* command to see if the loopback tests closer to the TN767E board are successful. If any of those loopback tests fail, follow the maintenance strategy associated with those loopbacks. Otherwise, escalate the problem.
	PASS	The CPE Loopback test has successfully began executing. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.

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Table 11-132. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Far CSU Loopback Test (#1213)

This test is destructive.

The Far CSU Loopback (R-LLB) Test causes a loopback at the far-end CSU and tests all circuitry and facilities from the local TN767E DS1 board to the far-end CSU.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS far-csu-loopback-test-begin* command.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Far CSU Loopback Test.

If the far-end CSU is not an AT&T 120A1 CSU Module, and the DS1 is administered for ami-zcs line coding, one's density protection must be disabled on the CSU during the test due to the large number of zeros in the 3-in-24 test pattern.

The Far CSU Loopback Test has the TN767E DS1 Interface circuit pack transmit a loopback activation code to the remote CSU, waits up to 15 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result. If the loopback is not established within the 15 seconds, the test fails.

The status of the Far CSU Loopback test will be available in the hardware error log via error type 3901. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and the number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of loopback/span test executing (*Test* field), the type of pattern generated for the loopback/span test (*Pattern* field), and whether the pattern (i.e., *3-in-24 Pattern*) is synchronized (*Synchronized* field).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 11-133. TEST #1213 Far CSU Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS far-csu-loopback-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Far CSU Loopback Test cannot be executed in the current configuration. To run this, the TN767E or later suffix DS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-133. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-133. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-133. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The Far CSU Loopback Test was not set up properly. The DS1 Interface circuit pack could not successfully put the far-end CSU into loopback mode.
3	FAIL	The Far CSU Loopback Test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the far-end CSU, could not be detected properly by the DS1 circuit pack. 1. Retry the *test ds1-loop PCSS far-csu-loopback-test-begin* command. 2. If the Far CSU Loopback test continues to fail with this error code, the problem could be with the TN767E board, the far-end CSU equipment, or somewhere in between. Run the *test ds1-loop PCSS cpe-loopback-jack-test-begin* command to see if the CPE Loopback Jack test which is closer to the TN767E board is successful. (If a CPE Loopback Jack device is not being used, then run the *test ds1-loop PCSS ds1/csu-loopback-tests* command to see if these even closer loopback tests succeed). If the closer loopback test fails, follow the maintenance strategy associated with that loopback. Otherwise, escalate the problem.
	PASS	The Far CSU Loopback test has successfully began executing. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.

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Table 11-133. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

One-Way Span Test (#1214)

This test is destructive.

The One-Way Span Test allows one-way span testing to and from remote test equipment or another DEFINITY communications system. This will test all circuitry and facilities from the local TN767E DS1 board to the remote test equipment or other DEFINITY communications system.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS one-way-span-test-begin* command.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the One-Way Span Test.

The One-Way Span Test has the TN767E DS1 Interface circuit pack transmit a framed 3-in-24 test pattern and attempt to receive and verify the pattern. If the TN767E board receives a framed 3-in-24 test pattern sent from another DEFINITY G3V3 or test equipment at the far-end of the DS1, it will begin counting bit errors within the received pattern.

The status of the One-Way Span test will be available in the hardware error log via error type 3902. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and the number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being sent cleanly over the span from the far-end, the number of bit errors should be very low. The *Test Duration* field will show *0* until the test pattern is received from the far-end. Upon receiving the test pattern, the board will begin calculating the test duration and number of bit errors. The command will also display the type of loopback/span test executing (*Test* field), the type of pattern for the loopback/span test 9 (*Pattern* field), and whether the pattern (i.e., *3-in-24 Pattern*) is synchronized (*Synchronized* field).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 11-134. TEST #1214 One-Way Span Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the *test ds1-loop PCSS one-way-span-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	One-Way Span Test cannot be executed in the current configuration. To run this, the TN767E or later suffix DS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-134. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). he hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-134. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
	PASS	The One-Way Span test has successfully began transmitting a framed 3-in-24 test pattern. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.

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Table 11-134. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

Inject Single Bit Error Test (#1215)

This test is destructive.

The Inject Single Bit Error Test will cause a single bit error to be sent within an active framed 3-in-24 test pattern.

The test is highly destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS inject-single-bit-error* command. An attempt to use this command will be rejected if none of the three long-duration DS1 loopback/span tests (CPE Loopback Jack Test, Far CSU Loopback Test, and One-Way Span Test) are active on a TN767E circuit pack.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Inject Single Bit Error Test.

The *list measurements ds1 summary* command displays the number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). Injecting this single bit error should increment the bit error count of the loopback/span test by one.

Table 11-135. TEST #1215 Inject Single Bit Error Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS inject-single-bit-error* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.

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Table 11-135. TEST #1215 Inject Single Bit Error Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-135. TEST #1215 Inject Single Bit Error Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	A single bit error has been successfully injected into an active framed 3-in-24 test pattern.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

End Loopback/Span Test (#1216)

This test is destructive.

The End Loopback/Span Test will terminate an active loopback or span test on a TN767E DS1 circuit pack. Bit error counting against the received test pattern stream is terminated and sending of the framed 3-in-24 test pattern is halted. If either the CPE Loopback Jack or the far-end CSU is looped, the appropriate loopback deactivate code is sent. If the loopback could not be deactivated, then the test will FAIL, and a MINOR alarm will be noted in the alarm log until the loopback is cleared.

The test is highly destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS end-loopback/span-test* command. Since only one of these three different long-duration loopback/span tests can be active at a time, the TN767E circuit pack knows which loopback/span test to terminate.

All trunks or ports on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running this End Loopback/Span Test.

The *list measurements ds1 summary* command will display the length of time the test ran (*Test Duration* field) and number of bit errors detected (*Loopback/Span Test Bit-Error Count* field).

To restore the trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state, execute the **release board** command.

Table 11-136. TEST #1216 End Loopback/Span Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	End Loopback/Span Test cannot be executed in the current configuration. To run this, the TN767E or later suffix DS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.

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Table 11-136. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
	ABORT	Internal System Error
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-136. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. All of the trunks for the DS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
1313	FAIL	The TN767E DS1 circuit pack could not deactivate the loopback through the Customer Loopback Jack. 1. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to fail with this error code, escalate the problem.

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Table 11-136. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1314	FAIL	The TN767E DS1 circuit pack could not deactivate the loopback through the far-end CSU. 1. Make sure that the far-end DS1 is installed if the far-end CSU is a 120A1 AT&T CSU Module. 2. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to fail with this error code, escalate the problem.
	PASS	The active long-duration loopback or span test on the TN767E circuit pack was successfully terminated.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

ICSU Status LEDs Test (#1227)

The TN767E DS1 circuit pack has four status LEDs on the faceplate in addition to the three standard faceplate LEDs. These four status LEDs are associated with the 120A1 Channel Service Unit (CSU) Module that can be connected to the TN767E board via the I/O connector panel on the back of the port carrier. The TN767E circuit pack combined with AT&T's new 120A1 CSU Module forms an Integrated CSU (ICSU).

This test is a visual test. It will light the four status LEDs red for 5 seconds, then light them green for 5 seconds, then light them yellow for 5 seconds, then turn the LEDs off, and return control of the status LEDs to the circuit pack.

This test will only be executed on TN767E or later suffix DS1 circuit packs administered for 24-channel operation (1.544 bit rate).

If the 120A1 CSU Module is not physically installed, the status LEDs are always off and this test will abort.

Table 11-137. TEST #1227 ICSU Status LEDs Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	The ICSU Status LEDs test can not be executed for the current configuration. The test applies only to TN767E or later DS1 circuit packs administered for 24-channel operation (1.544 bit-rate). 1. If the circuit pack is a TN767E or later suffix DS1 circuit pack, then retry the command. 2. If the test continues to abort, escalate the problem.
1951	ABORT	The ICSU Status LEDs Test can not be executed because a 120A1 or later suffix CSU Module is not physically installed. If using a 120A1 CSU Module, physically connect it to the TN464F board on the back of the port carrier. Otherwise, ignore this abort.

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Table 11-137. TEST #1227 ICSU Status LEDs Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
	PASS	The ICSU Status LEDs test executed successfully. A PASS result, however, does not necessarily mean that the status LEDs behaved properly. It only means that the software successfully attempted to light the status LEDs. This is a visual test. The service technician must visually exam the behavior of the LEDs while the test is running. The LEDs are functioning properly if the four status LEDs are lit red for 5 seconds, then lit green for 5 seconds, then lit yellow for 5 seconds. If the LEDs behave differently, the board should be replaced at the customer's convenience.

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Table 11-137. TEST #1227 ICSU Status LEDs Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **add ds1 PCSS** command to administer the DS1 interface if it is not already administered. 2. If board was already administered correctly, check the error log to determine if the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If the test continues to return NO BOARD, escalate the problem.

DT-LN-BD (Data Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DT-LN-BD	MIN	test board PCSS sh	Data Line Circuit Pack
DT-LN-BD	WRN	test board PCSS sh	Data Line Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also DAT-LINE (Data Line Circuit Port) Maintenance documentation for related line information.

DTMR-PT [Dual Tone Multifrequency Port (TTR)]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DTMR-PT	MAJOR	test port PCSSpp sh	Dual Tone Multifrequency Receiver Port (TTR)
DTMR-PT	MINOR	test port PCSSpp sh	Dual Tone Multifrequency Receiver Port (TTR)
DTMR-PT	WARNING	release port PCSSpp	Dual Tone Multifrequency Receiver Port (TTR)

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The Dual Tone Multifrequency Receiver Port (DTMR), also known as the Touch-Tone Receiver (TTR), resides on the Tone Detector circuit pack (TN748, TN420) or the TN756 Tone-Clock circuit pack. There are four Dual Tone Multifrequency Receiver (DTMR-PT) ports and two General Purpose Tone Detector (GPTD-PT) ports on a Tone Detector circuit pack. The DTMR port is used to detect touch-tone digits that are placed on the TDM bus. Examples of touch-tone digits are digits 0 through 9, digit #, and digit *. The ability of the DTMR port to detect touch-tone digits is essential for maintenance of other circuit packs (for example, Tone-Clock circuit pack) and in placing a station-to-station call. Calls originating from a hybrid station **do not** require a DTMR port.

The Dual Tone Multifrequency Receiver Port maintenance object defines a set of tests to verify that the DTMF digits detection capability of the DTMR port is functioning properly. For all Tone Detector circuit pack level errors (DETR-BD), refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation.

Hardware Error Log Entries and Test to Clear Values

Dual Tone Multifrequency Receiver Port (TTR) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (b)	17664	Tone Detector Audit/Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 2
18	0	busyout port PCSSpp	WARNING	ON	release port PCSSpp
130 (d)		None	WARNING	ON	test port *PCSSpp* sh r 2
257 (c)	17666	Tone Detector Audit/Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3
513	Any	Tone Detection Verification Test (#42)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. There are two possible alarm levels for this error: Major alarm and Minor alarm. A Major alarm is raised if the total number of DTMR ports currently in service is less than or equal to one half of the administered threshold number. Otherwise, a Minor alarm is raised. In either case, run the Short Test Sequence against the DTMR port and follow the error code procedures for the individual tests.

   The threshold number of DTMR ports for service is administered using the **change system-parameters maintenance** command.

b. This error indicates the DTMR port is having problems detecting touch-tone digits. If this error is being constantly logged, then the Tone Detector circuit pack containing the defective DTMR port should be replaced.

c. The DTMR port lost its translation. Testing the DTMR port is sufficient to reload its translation. If testing the DTMR port does not clear the error, then the Tone Detector circuit pack containing the defective DTMR port should be replaced.

d. This error type indicates that the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Tone Detection Verification Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test verifies the "touch-tone digits detection" capability of the DTMR port is functioning properly.

Table 11-138. TEST #42 Tone Detection Verification Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test or there was an Internal System Error.
1	ABORT	The system could not allocate all the resources needed to test the DTMR port.
1001	ABORT	The system was unable to put the DTMR port in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This could happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM Bus via the **test tdm [a|b]** command. Refer to the TDM-BUS (TDM Bus) Maintenance documentation for details. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a Tone Generator for the test connection. This could happen when the system is heavily loaded or there is not a Tone-Clock circuit pack in the port network when this test is being executed. 1. Make sure there is a Tone-Clock circuit pack in the same port network. 2. If a Tone-Clock circuit pack is missing, install one in the same port network. 3. Allow about one-minute for the Tone-Clock maintenance to run on the newly inserted Tone-Clock circuit pack. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-138. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2006	ABORT	DTMF detection failed. This could be caused by the administered companding mode of the system not matching that of the Tone Detector circuit pack. 1. Make sure that companding mode of the system matches that of the Tone Detector. 2. If the test continues to abort, escalate the problem.
1-3	FAIL	DTMF digits were not correctly detected. 1. Run the Short Test Sequence: **test port PCSSpp sh r 1**. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore the system performance to normal, replace the Tone Detector circuit pack containing the defective DTMR port.
	PASS	The DTMR port is able to detect all the touch-tone digits.

Tone Detector Audit/Update Test (#43)

The DTMR port is refreshed with all time slot information and sanity audit is performed on the DTMR port.

Table 11-139. TEST #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The system was not able to allocate all the resources needed for this test. 1. Wait one minute and try again.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Hardware audit failed. 1. Run the Short Test Sequence: **test port PCSSpp sh r 1**. 2. If the problem persists, the system is still operating properly but system capacity is reduced. In order to restore the system performance to normal, replace the Tone Detector circuit pack containing the defective DTMR port.
	PASS	The DTMR port has been successfully refreshed with its translation.

DUPINT (Duplication Interface Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
DUPINT (a)	MAJOR	test duplication 1C	Duplication Interface Circuit Pack
DUPINT (a)	WARNING	test duplication 1C	Duplication Interface Circuit Pack

1 Alarms on Duplication Interface circuit pack in the A carrier are always major alarms and alarms on Duplication Interface circuit pack in the B carrier are always warning alarms. Determine the carrier to test via the PORT field from the Alarm or Error Log.

In a High or Critical Reliability PPN system, there are two Duplication Interface circuit packs: one in carrier A and one in carrier B. Together, Duplication Interface circuit pack A and Duplication Interface circuit pack B provide memory shadowing (see SHDW-CIR Maintenance documentation for a full description) and communication between software on the Active and Standby SPEs. By itself, Duplication Interface circuit pack A provides control of the duplicated 80286 Processor circuit pack, environmental maintenance monitoring and control, and administration terminal connection.

Duplication Interface circuit pack A controls a lead that lets the Tone-Clock circuit packs know which of them is supposed to be active and additional leads that control which SPE is active. The system software can request that either the SPE Select lead or Tone-Clock lead be changed.

Duplication Interface circuit pack A controls and monitors the same environment leads that the Maintenance/Tape Processor does in a PPN a system without High or Critical Reliability. Duplication Interface circuit pack A also supports the serial channel to the PPN administration terminal in a High or Critical Reliability system PPN. The administration terminal is connected to Duplication Interface circuit pack A via a connector on the back of carrier A labeled **DOT** (Terminal for High or Critical Reliability system). At any time, the administration terminal may be disconnected from Duplication Interface circuit pack A and connected directly to the active Maintenance/Tape Processor by attaching the administration terminal to the connector marked **TERM** on the active carrier. This connection should only be made if the administration terminal fails to function since a problem with the Duplication Interface circuit pack A may be present. (See Figure 11-32 on page 11-733.)

The Duplication Interface circuit packs communicate over the Inter-Carrier Cable (ICC). The ICC connects the Duplication Interface circuit packs via pin fields on the backplane. The ICC consists of two 25-pin connector cables known as ICC-A and ICC-B. (**Note:** A single-carrier cabinet system has an ICC-C also.) The pin fields where ICC-A and ICC-B are connected are clearly labeled on the backplane near the pin fields for the Duplication Interface circuit packs. The ICC carries several important leads related to maintaining a High or Critical Reliability system.

NOTE:
The ICC carries the following leads and their respective information: shadowing information and shadowing state (enabled or disabled); 80286 Processor circuit pack select lead that indicates which 80286 Processor circuit pack is active; Tone-Clock select lead that indicates which Tone-Clock circuit pack is active; SPE Select Switch State leads which indicate the position of the SPE Select Switch; Emergency Transfer leads which indicate whether Emergency Transfer is on or off in the PPN cabinet; leads to tie INADS, CDR, and Customer-Provided Alarming Device from the two Maintenance/Tape Processors together; a serial connection between Duplication Interface circuit pack B and Duplication Interface circuit pack A, and a serial connection between Duplication Interface circuit pack A and Maintenance/Tape Processor B. There is also a serial connection between Duplication Interface circuit pack A and Maintenance/Tape Processor A wired into the backplane of carrier A. The Maintenance/Tape Processor communicates with 80286 Processor circuit pack (that is, system software) over the M-BUS via special memory locations located on the TN777 Processor circuit pack. This is true in both carriers A and B. The presence of the ICC also causes ID pins on the backplane to read as a High or Critical Reliability system rather than a Standard system.

Without the ICC properly attached, the system cannot function as a High or Critical Reliability system or as a Standard system.

The Duplication Interface circuit pack uses Universal Asynchronous Receiver Transmitters (UARTs) to support the various serial links. The UARTs are physically part of the Duplication Interface circuit packs and are tested and maintained. There are four UARTs on each circuit pack. They are used to support the serial link from Duplication Interface circuit pack A to Duplication Interface circuit pack B (Inter-Dupint UART), from Duplication Interface circuit pack A to the administration terminal from Duplication Interface circuit pack A to Maintenance/Tape Processor A (SPE A UART), and from Duplication Interface circuit pack A to Maintenance/Tape Processor B (SPE B UART).

NOTE:
The Duplication Interface circuit pack B does not communicate directly with either Maintenance/Tape Processor or the administration terminal and, thus, does not use the administration terminal, SPE A, or SPE B UART. These UARTs are, however, still tested. A failure of any one of these three results in a Warning alarm.

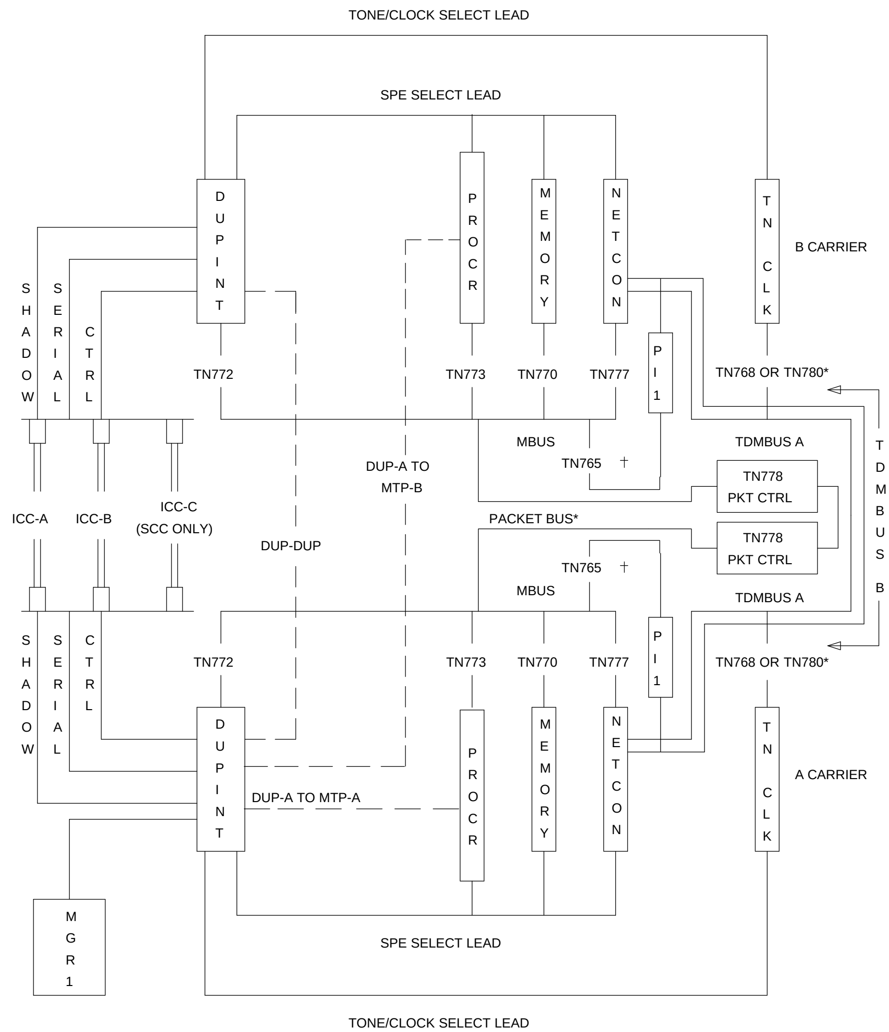
The flow of messages from 80286 Processor circuit pack A to 80286 Processor circuit pack B is as follows: from 80286 Processor circuit pack A to

Maintenance/Tape Processor A over the serial link to Duplication Interface circuit pack A over the serial link to Maintenance/Tape Processor B to 80286 Processor circuit pack B. The flow in the reverse direction is exactly the opposite.

NOTE:
The Duplication Interface circuit pack B is not involved in this communication. Duplication Interface circuit pack B is only involved in the shadowing of memory from the active to the standby carrier.

Figure 11-32 depicts the interconnection of the Duplication Interface circuit packs with the rest of the system. The dotted lines show the logical serial channel rather than actual physical implementation of the serial channel. For the sake of clarity, the UARTs are not shown. The following abbreviations are used in the figure:

- DUPINT for Duplication Interface circuit pack
- PR MAINT for Maintenance/Tape Processor
- PROCR for 80286 Processor circuit pack
- MEM BD for Memory



* G1.2 ONLY.

† MCC ONLY.

(IN A SINGLE-CARRIER CABINET CONFIGURATION, THERE CAN BE EITHER 0 or 1 PROCESSOR INTERFACE CIRCUIT PACK. IN A MULTI-CARRIER CABINET CONFIGURATION, THERE CAN BE 0, 1, OR 2 PROCESSOR INTERFACE CIRCUIT PACKS.)

Figure 11-32. Duplication Interface Circuit Pack Interactions

Hardware Error Log Entries and Test to Clear Values

Duplication Interface Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test dup 1C sh r 1
1		Sanity Circuit Test (#273)	MAJOR/ WRN	ON	test dup 1C l r 1
108 (c)	Any	None			
109 (c)	Any	None			
257		SAT Loop Back Test (#274)	MAJOR/ WRN	ON	test dup 1C sh r 3
513		SPE A Loop Back Test (#275)	MAJOR/ WRN	ON	test dup 1C sh r 3
769		SPE B Loop Back Test (#276)	MAJOR/ WRN	ON	test dup 1C sh r 3
1025		Sanity Maze Test (#277)	MAJOR /WRN	ON	test dup 1C sh r 3
1281 (d)	Any	Dupint Status Query Test (#315)	MAJOR/ WRN	ON	test dup 1C sh r 6
1537 (e)	Any	Background Test Query Test (#271)	MAJOR/ WRN	ON	test dup 1C sh r 3
1793 (f)	Any	MBUS Time-Out Query Test	MAJOR/ WRN	ON	test dup 1C l r 3
		(#285)			
2049		Inter-Dupint Loop Around Test (#280)	MAJOR/ WRN	ON	test dup 1C sh r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. Alarms on Duplication Interface circuit pack in the A carrier are always Major alarms, and alarms on Duplication Interface circuit pack in the B carrier are always Warning alarms.

b. Determine the carrier to test via the Port field from either the Alarm Log or the Error Log.

c. This error indicates that an unexpected hardware reset has occurred on the Duplication Interface circuit pack. Appropriate action has been taken by the software to prevent malfunction. However, if this type error occurs with regular frequency, the DUPINT circuit pack may need to be replaced.

d. There are several possible Aux Data fields for this error, including blank. All indicate loss of contact with the indicated Duplication Interface circuit packs. The following table summarizes the Aux Data fields.

Aux	Description
1 or 3	Duplication Interface circuit pack A lost handshaking with Duplication Interface circuit pack B.
2	MTP lost handshaking with the Duplication Interface circuit pack.
221	Duplication Interface circuit pack reported the trouble.
65315 or 65503	Duplication Interface circuit pack A lost contact with Duplication Interface circuit pack B.
Blank, 65313, or 65501	If reported against Duplication Interface circuit pack A, Duplication Interface circuit pack A lost handshaking with Maintenance/Tape Processor A. If reported against Duplication Interface circuit pack B, Duplication Interface circuit pack A lost handshaking with Maintenance/Tape Processor B.

e. An Aux value of blank or 65317 is valid. The 65317 aux value means the Duplication Interface circuit pack reported the trouble, while the blank means the software detected the trouble.

f. This could be caused by mismatched numbers of Processor Interface (TN765) or Packet Control (TN778) circuit packs in the two SPEs or by a defective Duplication Interface (TN772) Circuit Pack. If the Duplication Interface Circuit Pack is defective and becomes part of the Standby SPE, then memory shadowing does not work. Follow the procedures given for the FAIL case of Common Shadow Circuit M-Bus Time-Out Query Test (#285) in the SHDW-CIR section.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Duplication Interface Circuit Pack Status Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Duplication Interface Circuit Pack StatusQuery Test (#315)	X	X	ND
Duplication Interface Circuit Pack Sanity Circuit Test (#273)(a)		X	D
Duplication Interface Circuit Pack Sanity Maze Test (#277)	X	X	ND
Duplication Interface Circuit Pack SPE A Loop Back Test (#275)	X	X	ND
Duplication Interface Circuit Pack SPE B Loop Back Test (#276)	X	X	ND
Duplication Interface Circuit Pack Administration Terminal Loop Back Test (#274)(a)	X	X	ND
Inter-Duplication Interface Circuit Pack Loop Back Test (#280)	X	X	ND
Duplication Interface Circuit Pack Background Test Query Test (#271)	X	X	ND
Duplication Interface Circuit Pack Invalid Message Query Test (#272)	X	X	ND
Common Shadow Circuit M-BUS Time-out Query Test (#285) (b)		X	ND
Common Shadow Circuit Loop Back Test (#283) (b)	X	X	ND
Common Shadow Circuit Address Decoder Test (#284) (b)	X	X	ND
SPE Select Switch Query Test (#278) (c)	X		ND

1 D = Destructive; ND = Nondestructive

Notes:

a. When running the Long Test Sequence on Duplication Interface circuit pack A, the results of Test #273 may overwrite the results of Test #274.

b. Refer to SHDW-CIR (Common Shadow Circuit) Maintenance documentation for description of this test.

c. Refer to SPE-SELEC (SPE Select Switch) Maintenance documentation for description of this test.

Duplication Interface Circuit Pack Background Test Query (#271)

This test queries the Duplication Interface circuit pack for the results of its background tests. The response indicates the results of the last time the following background tests were run:

- ROM Checksum Test: This test verifies the correctness of the Duplication Interface circuit pack firmware.
- RAM Test: This tests verifies that the RAM on the Duplication Interface circuit pack is functioning properly.

Table 11-140. TEST #271 Duplication Interface Circuit Pack Background Test Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-140. TEST #271 Duplication Interface Circuit Pack Background Test Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2008 2009 2010	FAIL	One or both background tests failed on the Duplication Interface circuit pack. Error Code 2008 means the ROM test failed. Error Code 2009 means the RAM test failed. Error Code 2010 means both tests failed. 1. Follow the procedures for replacing Common Control circuit packs and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, escalate the problem.
	NO BOARD	The Duplication Interface circuit pack has failed to reply to handshaking from either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or from Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).

Duplication Interface Circuit Pack Invalid Message Query Test (#272)

The Duplication Interface Circuit Pack Invalid Message Query Test sets the threshold for the number of bad checksum errors the Duplication Interface circuit pack detects before reporting the problem to maintenance and queries the Duplication Interface circuit pack for the number of checksum errors detected. The error threshold is set to 10. The query causes Duplication Interface circuit pack firmware to clear its bad checksum error counter. This test is run on both circuit packs, but has little meaning on Duplication Interface circuit pack B and should always pass.

Table 11-141. TEST #272 Duplication Interface Circuit Pack Invalid Message Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The Duplication Interface circuit pack is receiving an abnormal number of corrupted messages. 1. First investigate other Duplication Interface circuit pack tests that are not passing. 2. If this is the only test that fails, investigate and resolve all alarms against PR-MAINT (Maintenance/Tape Processor). 3. Rerun the test. If the test still fails, follow the procedures for replacing Common Control circuit packs and replace the Duplication Interface circuit pack. 4. Rerun the test. If the test still fails, follow normal escalation procedures.

Continued on next page

Table 11-141. TEST #272 Duplication Interface Circuit Pack Invalid Message Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The Duplication Interface circuit pack has not received any bad messages from either Maintenance/Tape Processor or the other Duplication Interface circuit pack. All serial links are operating fine.

Duplication Interface Circuit Pack Sanity Circuit Test (#273)

This test is destructive.

This test checks the sanity hardware of a Duplication Interface circuit pack. The Duplication Interface circuit pack processor is instructed to allow the on-board circuit pack sanity timer to expire, which should cause the circuit pack to reset itself. The software then allows the Duplication Interface circuit pack 15 seconds to reset. After this time, the Duplication Interface circuit pack is queried for the results of its background tests (see Test #271). If the Duplication Interface circuit pack responds to this query, then the reset passes. If performed on Duplication Interface A, this test can cause an SPE interchange to the SPE in the B carrier if the A carrier SPE was active when the test was executed. The B carrier Tone-Clock circuit pack is also selected on Duplication Interface circuit pack A processor reset. This test is run only when demanded by software and can be performed on either Duplication Interface circuit pack. There is no service-disruption when this test is run on Duplication Interface B.

Table 11-142. TEST #273 Duplication Interface Circuit Pack Sanity Circuit Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
1037	ABORT	The active Tone-Clock circuit pack is currently the one in the A carrier. If the Duplication Interface circuit pack is allowed to be reset at this time, an unscheduled tone/clock switch would take place resulting in a Cold 2 restart. 1. Check for alarms against TONE-BD in the B carrier and refer to TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation to resolve these alarms. 2. When there are no alarms against TONE-BD in the B carrier, force the -one-Clock circuit pack to be active by issuing the **set tone-clock b** command. 3. Verify the B carrier Tone-Clock circuit pack is active by using the **status system** command. 4. Rerun the Duplication Interface circuit pack test.
2018	ABORT	Applicable only when testing Duplication Interface A. (1) Refer to STBY-SPE (Standby SPE) Maintenance documentation for a description of this error.
1185	ABORT	Only occurs when attempting to reset Duplication Interface A when SPE A is active and SPE A has not been selected via the SPE Select switch. In this case, resetting Duplication Interface A causes a warm start SPE-interchange to SPE B. 1. Issue the **reset system interchange** command to make SPE A the Standby SPE. 2. Repeat the test.

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Table 11-142. TEST #273 Duplication Interface Circuit Pack Sanity Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
2052	ABORT	Only occurs when attempting to reset Duplication Interface A. If SPE B is not in Standby Mode, ready to take over, then this test aborts. 1. Look for and resolve all STBY-SPE errors and alarms. 2. Use the **refresh spe** command to place SPE B in Standby Mode. 3. Repeat the test.
2000	FAIL	The software timed out waiting for Duplication Interface circuit pack to respond to the background test query. 1. Rerun the test. 2. If the test fails with a 2000 again, then deal with the Duplication Interface Circuit Pack Status Query Test (#315) results first.
	FAIL	The sanity timer circuit on the Duplication Interface circuit pack is defective. The Duplication Interface circuit pack should be replaced. 1. Follow the procedure for replacing Common Control circuit packs, and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, follow normal escalation procedures.

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Table 11-142. TEST #273 Duplication Interface Circuit Pack Sanity Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The Duplication Interface circuit pack successfully reset. The Duplication Interface circuit pack may still have problems related to any of the other Duplication Interface circuit pack tests. Follow up on any other test failures.

Duplication Interface Circuit Pack Administration Terminal Loop Back Test (#274)

This test loops back data through the UART used to communicate with administration terminal. The data is generated by the Duplication Interface circuit pack processor and is looped through the UART. The test is done entirely on the Duplication Interface circuit pack. The test passes if the data sent matches the data received. This test does not check the physical serial channel that is printed on the backplane or carried by the ICC.

Table 11-143. TEST #274 Duplication Interface Circuit Pack Administration Terminal Loop Back Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The tested UART on the Duplication Interface circuit pack is defective. 1. If this is Duplication Interface circuit pack A, then the circuit pack must be replaced to restore duplication. If this is Duplication Interface circuit pack B, then this failure has no real impact on the system. However, since this Duplication Interface circuit pack can never be used in the A carrier, it should be replaced at some point. 2. Follow the procedures for replacing Common Control circuit packs, and replace the Duplication Interface circuit pack. 3. Rerun the test. If the test still fails, follow normal escalation procedures.

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Table 11-143. TEST #274 Duplication Interface Circuit Pack Administration Terminal Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The administration terminal UART on the Duplication Interface circuit pack is good. This implies that Duplication Interface circuit pack A should be able to communicate with the administration terminal. This implies that Duplication Interface circuit pack B has a good UART. If there are problems bringing up the administration terminal, check the following: 1. Verify the terminal is connected to the connector labeled **DOT** on the back of carrier A and that the connector is securely fastened. 2. Verify the terminal is set up for 9600 baud. 3. If the terminal still does not work, replace the administration terminal.

Duplication Interface Circuit Pack SPE A Loop Back Test (#275)

This test loops data back through the UART used to communicate with Maintenance/Tape Processor A. The data is generated by the Duplication Interface circuit pack processor and is looped through the UART. The test is done entirely on the Duplication Interface circuit pack. The test passes if the data sent matches the data received. This test does not check the physical serial channel that is printed on the backplane or carried by the ICC.

Table 11-144. TEST #275 Duplication Interface Circuit Pack SPE A Loop Back Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The tested UART on the Duplication Interface circuit pack is defective. 1. If this is Duplication Interface circuit pack A, then the circuit pack must be replaced to restore duplication. If this is Duplication Interface circuit pack B, then this failure has no real impact on the system. However, since this Duplication Interface circuit pack can never be used in the A carrier, it should be replaced at some point. 2. Follow general procedures for replacing Common Control circuit packs, and replace the Duplication Interface circuit pack. 3. Rerun the test. If the test still fails, follow normal escalation procedures.

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Table 11-144. TEST #275 Duplication Interface Circuit Pack SPE A Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The SPE A UART on the Duplication Interface circuit pack is good. This implies that Duplication Interface circuit pack A should be able to communicate with SPE A. This implies that Duplication Interface circuit pack B has a good UART.

Duplication Interface Circuit Pack SPE B Loop Back Test (#276)

This test loops back data through the UART used to communicate with Maintenance/Tape Processor B. The data is generated by the Duplication Interface circuit pack processor and is looped through the UART. The test is done entirely on the Duplication Interface circuit pack. The test passes if the data sent matches the data received. This test does not check the physical serial channel that is printed on the backplane or carried by the ICC.

Table 11-145. TEST #276 Duplication Interface Circuit Pack SPE B Loop Back Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The tested UART on the Duplication Interface circuit pack is defective. 1. If this is Duplication Interface circuit pack A, then the circuit pack must be replaced to restore duplication. If this is Duplication Interface circuit pack B, then this failure has no real impact on the system. However, since this Duplication Interface circuit pack can never be used in the A carrier, it should be replaced at some point. 2. Follow general procedures for replacing Common Control circuit packs, and replace the Duplication Interface circuit pack. 3. Rerun the test. If the test still fails, follow normal escalation procedures.

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Table 11-145. TEST #276 Duplication Interface Circuit Pack SPE B Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or with Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The SPE B UART on the Duplication Interface circuit pack is good. This implies that Duplication Interface circuit pack A should be able to communicate with SPE B. This implies that Duplication Interface circuit pack B has a good UART.

Duplication Interface Circuit Pack Sanity Maze Test (#277)

This test tests the Duplication Interface circuit pack processor's ability to write through the maze circuit. The Sanity Maze is a piece of circuitry on the Duplication Interface circuit pack that the Duplication Interface circuit pack Processor must write through to get access to leads controlled by the Duplication Interface circuit pack (Tone-Clock Select Lead, 80286 Processor circuit pack Select Leads, etc.). This maze circuitry ensures that the processor on the Duplication Interface circuit pack is sane before any of these leads are changed. The Duplication Interface processor is instructed to write bit patterns through the maze circuit. The Duplication Interface processor examines the output of the maze circuit and compares it with the input.

Table 11-146. TEST #277 Duplication Interface Circuit Pack Sanity Maze Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The Sanity Maze Circuit or the processor on the Duplication Interface circuit pack is defective, which implies the Duplication Interface circuit pack can no longer be relied upon to control and support a High or Critical Reliability system. The Duplication Interface circuit pack needs to be replaced. 1. Follow general procedures for replacing Common Control circuit packs and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, follow normal escalation procedures.

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Table 11-146. TEST #277 Duplication Interface Circuit Pack Sanity Maze Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or with Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The Duplication Interface circuit pack Sanity Maze is good. This implies that Duplication Interface circuit pack can correctly control the SPE Select and Tone-Clock Lead.

Inter-Duplication Interface Circuit Pack Loop Back Test (#280)

This test loops back data through the UART used to communicate with the other Duplication Interface circuit pack. The data is generated by the Duplication Interface circuit pack processor and is looped through the UART. The test is done entirely on the Duplication Interface circuit pack. The test passes if the data sent matches the data received. This test does not check the physical serial channel that is printed on the backplane or carried by the ICC.

Table 11-147. TEST #280 Inter-Duplication Interface Circuit Pack Loop Back Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The tested UART on the Duplication Interface circuit pack is defective. 1. Follow general procedures for replacing Common Control circuit packs and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, follow normal escalation procedures.
	NO BOARD	The Duplication Interface circuit pack B has failed to reply to handshaking either from Duplication Interface circuit pack A. 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315).
	PASS	The Inter-DUPINT UART on the tested Duplication Interface circuit pack is good.

Duplication Interface Circuit Pack Status Query Test (#315)

This test is used to detect the presence of Duplication Interface circuit pack A and Duplication Interface circuit pack B. Duplication Interface circuit pack A handshakes with each Maintenance/Tape Processor and with Duplication Interface circuit pack B. To determine the status of Duplication Interface circuit pack B, a query is sent to the Duplication Interface circuit pack A. To determine the status of Duplication Interface circuit pack A, a query is sent to the Maintenance/Tape Processor on the active carrier. The response to either query indicates the status of the handshake to the appropriate Duplication Interface circuit pack.

Table 11-148. TEST #315 Duplication Interface Circuit Pack Status Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
2000	ABORT	The software timed out waiting for the reply message. 1. Rerun the test. 2. If the message times out again, then continue to the next step. If the query fails with a NO BOARD, then refer to NO BOARD on the next page of this table. 3. No response is being received from the Duplication Interface circuit pack or Maintenance/Tape Processor. If Duplication Interface circuit pack A is under-test, then check for and resolve all alarms against the active PR-MAINT (Maintenance/Tape Processor). If Duplication Interface circuit pack B is under test, then enter the **test dup a** system technician command and resolve problems with Test #315 for Duplication Interface circuit pack A first. 4. Rerun the test. If it still aborts, then a problem may exist with one of the serial links. If carrier B is active or Duplication Interface circuit pack B is under test, then the serial link to get to Duplication Interface circuit pack B is being carried by the ICC. Check for damage to the ICC, and verify that all four connectors for the ICC are plugged in. If the ICC has to be replaced, the system must be powered down. 5. If the ICC is not the problem, then that portion of the serial link wired into carrier A and/or carrier B may be defective, and the carrier pack may need to be replaced.

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Table 11-148. TEST #315 Duplication Interface Circuit Pack Status Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-148. TEST #315 Duplication Interface Circuit Pack Status Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The handshake to one of the Duplication Interface circuit packs has stopped. The circuit pack may be defective or communication to the circuit pack is hampered. 1. Look in the Hardware Error Log for error types against TAPE. If TAPE error types are present, resolve them since TAPE error types can cause Test #315 to fail. Refer to TAPE Maintenance documentation for recommended repair strategy. 2. After any TAPE error types are resolved, issue the **test duplication-interface** command on the suspect Duplication Interface circuit pack. If Test #315 fails on Duplication Interface A, Duplication Interface A is defective. Replace the Duplication Interface A circuit pack. If Test #315 fails on Duplication Interface B, Duplication Interface circuit pack A or Duplication Interface circuit pack B may be defective. In this case, it is necessary to determine which Duplication Interface circuit pack (A or B) is the defective one. To do this, issue the **test duplication-interface A** command. If Test #280 fails on Duplication Interface A, (and Test #315 has just failed on Duplication Interface B), Duplication Interface circuit pack A is defective and should be replaced. If Test #280 passes on Duplication Interface A (and Test #315 has just failed on Duplication Interface B), replace the Duplication Interface circuit pack B. 3. Reissue the **test duplication-interface** command on the Duplication Interface circuit pack that was replaced. If Test #315 still fails, check for problems with the Inter-Carrier Cables (ICCs). If any of the ICCs is defective, replace it. 4. Rerun the test. If Test #315 still fails, escalate the problem.

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Table 11-148. TEST #315 Duplication Interface Circuit Pack Status Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or with Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Follow the FAIL directions above.
	PASS	The tested Duplication Interface circuit pack is present and sane enough to handshake.

EMG-XFER (Emergency Transfer)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
EMG-XFER	MAJOR	test environment P	Emergency Transfer
EMG-XFER	WARNING	test environment P	Emergency Transfer

1 Where P is an appropriate port network number determined via the PORT field from the Alarm or Error Log.

The system provides the ability to cut designated analog phones through to CO trunks if the switch cannot provide even minimal phone service. This ability is known as Emergency Transfer. Each port network PPN and EPN can have a separate Emergency Transfer capability. The EMG-XFER MO tracks the control of Emergency Transfer. There is one EMG-XFER MO for each port network. Emergency Transfer can be controlled by the system or can be manually controlled within each port network via the Emergency Transfer switch(es) which is (are) located on the 80286 Processor circuit pack and the EPN Maintenance circuit pack. If the Emergency Transfer switch or switches in a High or Critical Reliability system on the 80286 Processor circuit pack or EPN Maintenance circuit pack are in a manual position, the system cannot change the state of Emergency Transfer within that port network. A manual ON position (to the right) generates a Major alarm. A manual OFF position (to the left) generates a Warning alarm. Unless a technician is currently working on the switch, the switches should be left in the auto position (). On a High or Critical Reliability system, the switches on BOTH 80286 Processor circuit packs must be in the ON position to manually invoke Emergency Transfer. However, if EITHER switch is in the OFF position, Emergency Transfer cannot be controlled by the system and is in the manual OFF state. The **status system** system technician command displays the current state of the Emergency Transfer switches in the system. Valid states for the switches are: *manual ON, manual OFF, auto ON* (the switch is in the auto position and the system has invoked Emergency Transfer), or (the switch is in the auto position and the system has invoked Emergency Transfer), or *auto OFF* (the switch is in the auto position and the system has not invoked Emergency Transfer).

Hardware Error Log Entries and Test to Clear Values

Emergency Transfer Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
1	Any	Emergency Transfer Query (#124)	MAJOR	ON	test environment P r 3
257	0	Emergency Transfer Query (#124)	WARNING	ON	test environment P r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Multicarrier System

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
Power Unit Query Test (Carrier E) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier D) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier A) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier B) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier C) (#127) (c)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Sensors Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to POWER (Battery & Battery Charger) Maintenance documentation for a description of this test.

b. Refer to AC-POWER (AC Power) Maintenance documentation for a description of this test.

c. Refer to CARR-POW (Carrier Port Power Unit for AC-Powered Systems) Maintenance documentation for a description of this test.

d. Refer to CABINET (Cabinet Sensors) Maintenance documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test.

NOTE:
These tests only show up in the test sequence if there is a TN768 Tone-Clock circuit pack in the port network being tested.

Single-Carrier System

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Power Query Test (#79) (a)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Alarm Lead Query Test (#120) (b)	X	X	ND
Analog Ring Generator Initialization Test (#117) (c)	X	X	ND
Analog Ring Generator Query Test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to DC-POWER (Single-Carrier Cabinet Power) Maintenance documentation for a description of this test.

b. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

c. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test.

NOTE:
These tests only show up in the test sequence if there is a TN768 Tone-Clock Board in the port network being tested.

Emergency Transfer Query Test (#124)

This test queries the hardware for the state of the Emergency Transfer switch (or switches in a High or Critical Reliability system) and reports the result. If the switch(es) is (are) in a position where the system software can control Emergency Transfer, then the test passes. If the switch(es) is (are) in a position where the system software cannot control Emergency Transfer, then the test fails. In the PPN, the Maintenance/Tape Processor controls Emergency Transfer and, in the EPN, the EPN Maintenance circuit pack controls Emergency Transfer. The system software does not have control of Emergency Transfer within a cabinet if the switch(es) is (are) in the manual ON or manual OFF state for that cabinet.

Table 11-149. TEST #124 Emergency Transfer Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Then, repeat the test. 3. If the test continues to ABORT with a 2000 error code, check for and resolve all DUPINT (Duplication Interface) errors in a PPN for a High or Critical Reliability system, PR-MAINT (Maintenance/Tape Processor) errors in a Standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 4. If the test continues to ABORT with a 2000 error code, escalate the problem.

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Table 11-149. TEST #124 Emergency Transfer Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	Emergency Transfer is manually turned OFF via the Emergency Transfer switch(es).
2	FAIL	Emergency Transfer is manually turned ON via the Emergency Transfer switch(es). 1. Place the switch (or switches in a PPN for a High or Critical Reliability system) in the AUTO position.
	PASS	The system software has control of Emergency Transfer within this port network. If Emergency Transfer is invoked, then there can be a Major alarm in the system that is invoking Emergency Transfer. The following table lists the error types and MOs that may cause Emergency Transfer. If any or all of these errors appear in the log, then refer to the appropriate Maintenance documentation and resolve those problems first. If none of these errors appear in the log, then check the Emergency Transfer hardware. Specifically, on the EPN, if Emergency Transfer is invoked while call processing is permitted, verify that the current limiter card (982LS) is in the correct slot on the backplane. If the current limiter card is not in the correct slot, move it to the correct location and rerun this test.

Test #124 Error Log Entries That Cause Emergency Transfer

MO Name	Error Type	Aux Data
TAPE	3329	0
SW-CTL	1	
SW-CTL	2	
TONE-BD	1	0
TONE-BD	2305	0

EPN-SNTY (EPN Sanity Audit)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
EPN-SNTY	None	None	EPN Sanity Audit

The EPN Sanity Audit feature enhances the system's ability to recover from failure conditions that disable an entire EPN. In such situations, not only is the affected EPN unable to provide service to the system, but the system itself has not detected the condition. The EPN Sanity Audit feature recognizes an EPN as unable to provide service when the software cannot receive control messages from EPN circuit packs. When such a failure is detected by the EPN Sanity Audit, a sequence of recovery actions is triggered to restore the EPN to service.

For a Standard system, the recovery sequence is as follows:

1. TDM Bus Switch
2. EPN Reset

For a duplicated system, the recovery sequence is as follows:

1. TDM Bus Switch
2. Expansion Interface Link Switch
3. Tone/Clock Switch within the EPN
4. EPN Reset

The EPN Sanity Audit feature activates only when all existing maintenance operations have failed to detect the EPN problem. Therefore, the EPN Sanity Audit serves as a safety net for the EPN.

NOTE:
It is not clear why certain types of EPN problems activate this feature. Thus, error log entries related to these problems do not specify which hardware to replace. The error log entries only indicate that some drastic recovery action occurred due to an unknown problem. However, clues as to the root cause of the EPN outage may be present in the Error Logs and the Alarm Logs of the following MOs: Switch Control (SW-CTL), TDM Bus (TDM-BUS), Expansion Interface (EXP-INTF), and TDM Bus Clock (TDM-CLK). Therefore, it is recommended that you refer to these maintenance sections during trouble shooting operations.

Hardware Error Log Entries and Test to Clear Values

EPN-SNTY Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any			None
8801 (a)	Any	None			
8802 (b)	Any	None			
8803 (c)	Any	None			
8804 (d)	Any	None			
9901 (e)	Any	None			
9902 (f)	Any	None			
9903 (g)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error occurs whenever the EPN is unable to send up-link control messages and the control channel of the TDM Bus in the EPN has been switched as part of the recovery procedure.

b. This error occurs whenever the EPN is unable to send up-link control messages and an EI link switch has been invoked as part of the recovery procedure.

c. This error occurs each time whenever the EPN is unable to send up-link control messages and the EPN Tone-Clock has been switched as part of the recovery procedure.

d. This error occurs whenever the EPN is unable to send up-link control messages and the EPN has been reset as part of the recovery procedure.

e. This error occurs whenever the EPN is unable to send up-link control messages, but recovers after the control channels of the TDM Bus in the EPN are switched.

f. This error occurs whenever EPN is unable to send up-link control messages, but recovers after the Expansion Interface Links to the EPN are switched.

g. This error occurs whenever the EPN is unable to send up-link control messages, but recovers after the active Tone-Clock in the EPN is switched.

ERR-LOG (Error Log)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
ERR-LOG	none	none	Error Log

Functional Description

The ERR-LOG MO is responsible for the sanity of the Alarm Log, the Hardware Error Log, and the Software Error Log. If an inconsistency is detected in any one of these logs, all logs are re-initialized and a hardware error is logged against ERR-LOG indicating the time of inconsistency. There are no tests and no alarms for the Error Log MO. This MO exists solely for the purpose of allowing errors to be logged against it.

Hardware Error Log Entries and Test to Clear Values

Error Log Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	Any	Any	Any	Any	none
510 (a)	Any	none	none	none	none

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates that an inconsistency was detected in either the Alarm Log, the Hardware Error Log, or the Software Error Log. To recover from this error, all of the logs were cleared and re-initialized. Any alarms that were active at the time of this error have been cleared. There is no associated test for this error. If the error persists, escalate the problem.

   The Aux data value indicates when the inconsistency was found:

0	Found during a periodic audit of the Error Log
1	Found after an extended reboot

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2	Found after a reboot
3	Found after a Reset System 3 (Cold_1)
4	Found after a Reset System 2 (Cold_2)
16	Found after a Warm Start
100	Found after an internal software audit

ETR-PT (Enhanced Tone Receiver Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ETR-PT(a)	MAJOR	test port PCSSpp sh	Enhanced Tone Receiver Port
ETR-PT	MINOR	test port PCSSpp sh	Enhanced Tone Receiver Port
ETR-PT	WARNING	test port PCSSpp sh	Enhanced Tone Receiver Port

1 P is the port network number (1 for PPN, 2 - 3 for EPNs). C is the carrier designation (A, B, C, D, or E). SS is the number of the slot in which the circuit pack resides (01 to 21).

NOTE:
Replacing the tone/clock circuit pack requires a special procedure which is described in the documentation for TONE-BD. That section also describes the LED display for this board.

The TN2182 is a combined Tone Generator/Tone Detector board. It provides 8 Enhanced Tone receiver (ETR) ports. Each of these ports provides the functions previously found individually on DTMR-PTs, GPTD-PTs and CLAS-PTs ports. Thus each port on the TN2182 may be used for any tone detection function that was previously done by TN748, TN420 or TN744 Tone detection boards.

The TN2182 provides Mu-law or A-law tone detection capability.

Since the TN2182 also provides Tone/Clock function only one (or two if your system is duplicated) TN2182 circuit packs may be present in a port network. Thus if more tone detection resources are needed, the additional resources must be provided by TN748, TN420 or TN744 circuit packs.

Hardware Error Log Entries and Test to Clear Values

Enhanced Tone Receiver Port (ETR-PT) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1	any	Tone Detector Audit/Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 2
18		busyout port	WARNING	OFF	release port PCSSpp
257 (b)	17666	Tone Detection Audit Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3
513 (c)	any	Tone Detection Verification Test (#42)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3

Notes:

a. There are two possible alarm levels for this error type: major alarm and minor alarm. These alarm levels are dependent on the administered thresholds for TTR, CPTR and CCTR. Each ETR port is capable of operating an any of these.

   A major alarm is raised if the total number of ports capable of TTR, CPTR or CCTR detection currently in-service is less than or equal to 1/2 of the administered TTR, CPTR or CCTR threshold number.

   Otherwise, a minor alarm is raised. In either case, run the short test sequence against the port (ETR-PT) and follow the error code procedures for the individual tests.

   The threshold number of ports for service is administered using the **change system-parameters maintenance** command. For details, refer to "Chapter 5, ''Routine Maintenance Procedures''.

b. The ETR-PT lost its translation. Testing the ETR-PT is sufficient to reload its translation. If testing the ETR port does not clear the error, then the TN2182 circuit pack containing the defective ETR port should be replaced at a time when it is convenient to remove a clock board from the system. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.

c. This error indicates the (ETR-PT) Enhanced Tone Receiver port is having problems detecting touch tones, call progress or MFC tones. If this error type is persistently logged, then the TN2182 circuit pack containing the defective ETR-PT should be replaced at a time it is convenient to remove a clock board from the system. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.

d. The ETR-PT lost its translation. Testing the ETR-PT is sufficient to reload its translation. If testing the ETR port does not clear the error, then the TN2182 circuit pack containing the defective ETR port should be replaced at a time when it is convenient to remove a clock board from the system. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Tone Detection Verification Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detection Audit/Update Test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test checks out a single ETR port in the touch-tone receiver mode MFC tone detection/generation mode and general purpose tone detection mode. During the first portion of the test, the touch-tone receiver mode is tested. Then general purpose call progress and maintenance tones are tested and lastly MFC tones are tested.

Table 11-150. TEST #42 Tone Detection Verification Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test OR there was an Internal System Error.
1	ABORT	The system could not allocate all the resources needed to test the tones.
1001	ABORT	The system was unable to put the ETR-PT in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This situation could occur when the system is heavily loaded. If the system is not heavily loaded, then test the TDM-BUS via the **test tdm** command. Refer to TDM-BUS for details. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. 1. Check to see if there are any alarms against the Tone-Clock in the port network where the test aborted. If so refer to the recommended procedures for TONE-BD or TONE-PT. 2. If a new Tone-Clock has been inserted, allow about 1 minute for maintenance to run on the newly inserted circuit pack. 3. Retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.

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Table 11-150. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Circuit Pack's response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2006	ABORT	This abort code indicates that the active Tone-Clock circuit pack or a Tone Detector circuit pack may not be functioning properly. On G3r V2 systems, this abort can also be caused by a mismatch between the companding mode administered for the system and that of the Tone Detector circuit pack. 1. [G3r V2] Make sure that the companding mode of the system matches that of the Tone Detector: mu-law for TN748; A-law for TN420. 2. Test the *active* Tone-Clock circuit pack in the port network with the **test tone-clock** PC command and refer to the TONE-BD section for failures. 3. Retry the command at 1-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1-122	FAIL	DTMF digits were not detected correctly. 1. Run the short test sequence via the **test port** PCSSpp **sh r 1** command. 2. If the problem persists, the system is still operating properly but capacity will be reduced. To restore performance to normal, replace the circuit pack containing the defective ETR-PT (Enhanced Tone Receiver Port). Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.

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Table 11-150. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
102	FAIL	2225 Hz Modem Answer Tone was not detected correctly. This will impact call-classification operation. 1. Run the short test sequence via the **test port** PCSSpp sh r 1 command. 2. If the problem persists, the system can still operate properly but capacity will be reduced. In order to restore performance to normal, replace the circuit pack containing the defective port. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.
130	FAIL	Forward or Backward MFC signals were not correctly generated or detected. This will impact MFC calls. 1. Run the short test sequence via the **test port** PCSSpp sh r 1 command. 2. If the problem persists, the system can still operate properly but capacity will be reduced. In order to restore performance to normal, replace the TN2182 circuit pack containing the defective ETR-PT. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.
	PASS	Tone Detection Verification is successful. The ETR Port is able to detect/generate all necessary tones.

Tone Detector Audit/Update Test (#43)

A Digital Signal Processor sanity audit is performed on the ETR-PT.

Table 11-151. TEST #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test. 1. Wait 1 minute, and repeat the command a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Hardware audit failed. 1. Run the short test sequence via the **test port PCSSpp sh r 1** command. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore system performance to normal, replace the circuit pack containing the defective ETR-PT. Follow the procedures described in the TONE-BD section for replacing a tone/clock circuit pack.
	PASS	The ETR Port has passed the sanity inquiry.

EXP-INTF (Expansion Interface Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
EXP-INTF	MAJOR	test board PCSS sh	Expansion Interface Circuit Pack
EXP-INTF	MINOR	test board PCSS sh	Expansion Interface Circuit Pack
EXP-INTF	WARNING	test board PCSS sh	Expansion Interface Circuit Pack

1 Where P is the port network number 1, 2 or 3, C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

CAUTION:

A detailed flowchart for isolating and resolving Packet Bus faults is included in Chapter 9, "Packet Bus Fault Isolation and Correction". This flowchart, along with the other information presented in the chapter, can help in resolving problems relevant to the Packet Path of the TN570 Expansion Interface. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to reference Chapter 9, "Packet Bus Fault Isolation and Correction" in addition to the relevant MO documentation.

The TN570 or the TN776 Expansion Interface circuit pack is used in G3iV1.1-286 and G3iV2-386 systems to provide connectivity between the Processor Port Network (PPN) and either Expansion Port Network (EPN) (network 2 or 3) or between the two Expansion Port Networks. The TN776 Expansion Interface is used in G1 systems to provide connectivity between the Processor Port Network and the (single) Expansion Port Network. This connectivity is provided via a 32 mpbs fiber optic cable. The TN776 supports circuit-switched connections and the control channel to and from the EPN. The TN570 also supports packet-switched connections for those systems that use the Packet Bus. The TN776 and TN570 circuit packs must only be used in matched pairs. A TN776 circuit pack does not function if connected via fiber to a TN570 circuit pack and vice versa.

The EPN(s), if present, are always under the control of the TN777 Processor circuit pack in the PPN. Therefore, if the Expansion Interface circuit packs to the EPN are not functioning correctly, service may be unavailable in that EPN, but is available in the PPN. If the Expansion Interface circuit packs between EPNs are not functioning properly, there is service in all networks, but connectivity between EPN and EPN is not available.

A system with EPN(s) may have one or two pairs of Expansion Interface circuit packs connecting any two cabinets. If two pairs exist, one pair operates as the Active pair and provides the required connectivity. The second pair acts as a hot Standby. When a problem arises on the Active pair, the Standby pair may be called upon to take over and provide continuous service with stable calls being preserved. The Expansion Interface circuit packs must be inserted into fixed slots. In G3iV1.1-286 and G3iV2-386, the valid slots for Expansion Interface circuit packs are: 1A01, 1A02, 1B01, 1B02, 2A01, 2A02, 2B02, 2B03, 3A01, 3A02, 3B02, or 3B03; in G1 the valid slots are: 1A01, 2A01, 1B01, or 2B02. It is also a requirement that the fiber cables be connected according to the following table:

Expansion Interface Circuit Pack Connections

EXP-INTF in slot	connected to EXP-INTF in slot	Description
1A01	2A01	Network 1 to Network 2
1B01	2B02	Network 1 to Network 2 (Duplicated Link)
1A02[1]	3A01	Network 1 to Network 3
1B02[1]	3B02	Network 1 to Network 3 (Duplicated Link)
2A02[1]	3A02	Network 2 to Network 3
2B03[1]	3B03	Network 2 to Network 3 (Duplicated Link)

1 G3iV1.1-286 and G3iV2-386 only.

NOTE:
If Expansion Interface circuit packs are connected in any other way, they do not function properly.

The Active Expansion Interface Link may be selected by system technician via the **set expansion-link PCSS** command, where PCSS is the address of either Standby Expansion Interface circuit pack. System Technician may prevent the system from switching Expansion Interface Links by using the **busyout board PCSS** command, where PCSS is the address of either Standby Expansion Interface circuit pack. These two commands are described later in greater detail in the "Expansion Interface Link Switch Command" section (located at the end of this EXP-INTF Maintenance documentation).

A G3MT terminal connected to an EPN [G3i] provides the same maintenance and administrative capabilities as the local administration terminal, but at a slower transmission speed. The EPN Maintenance circuit pack also provides Emergency Transfer and environmental monitoring functions for the EPN.

The abbreviations used in Figure 11-33 and Figure 11-34 have the following meanings:

- **PROC** The TN773 Processor circuit pack (the Active TN773 Processor circuit pack in a High or Critical Reliability system)
- **NETCON** The SW-CTL portion of the Network Control circuit pack (the Active Network Control circuit pack in a High or Critical Reliability system)
- **TDM BUS** The Time Division Multiplex Bus that connects circuit packs within a cabinet
- **EXP-INTF** The Expansion Interface (EXP-INTF) circuit pack
- **FIBER** The optical fiber used to connect Expansion Interface circuit packs
- **MAINT** EPN Maintenance (MAINT) circuit pack
- **PKT-BUS** The Packet Bus used to carry ISDN-BRI signalling information
- **MGR 1** The local administration terminal

The following figures show the connectivity for a 3-port network [G3iV1.1-286, G3iV2-386, G1] system with duplicated Expansion Links.

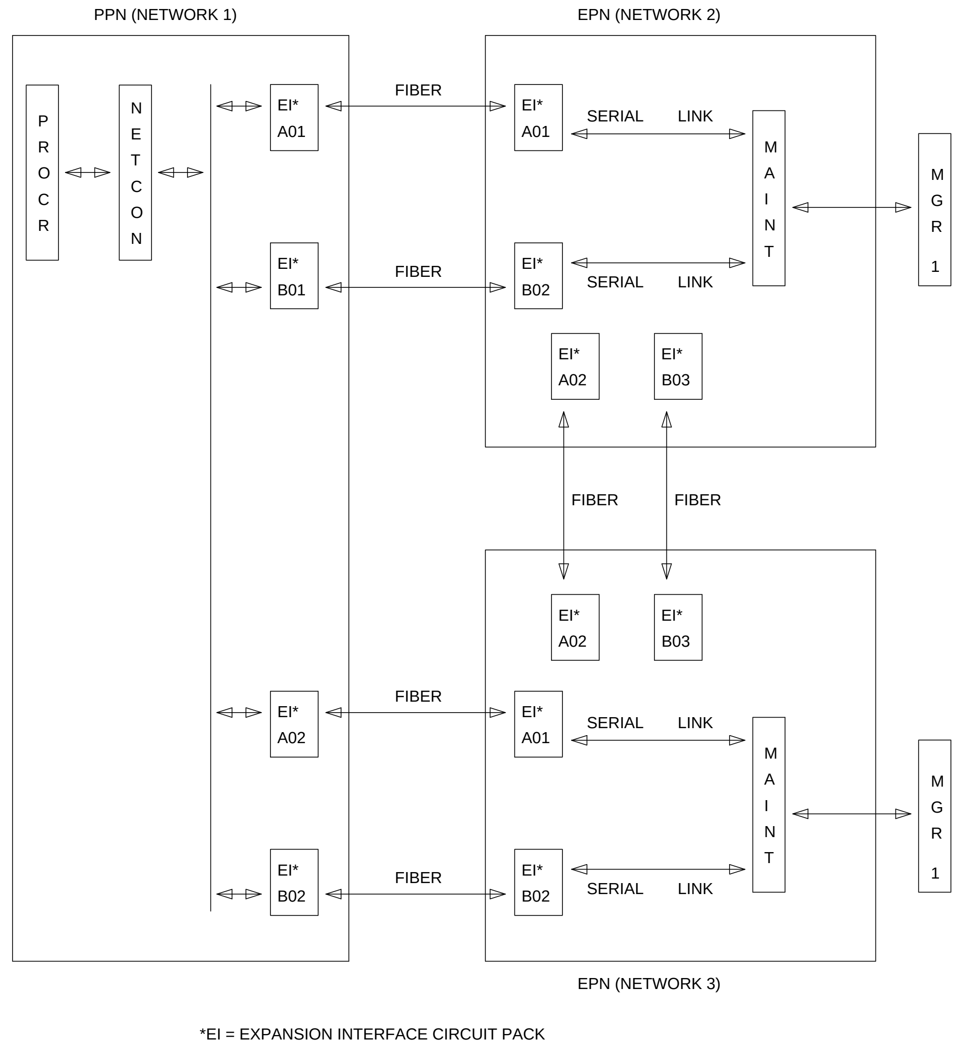

Figure 11-33. Expansion Interface Link Connectivity Between PPN and EPN(s)

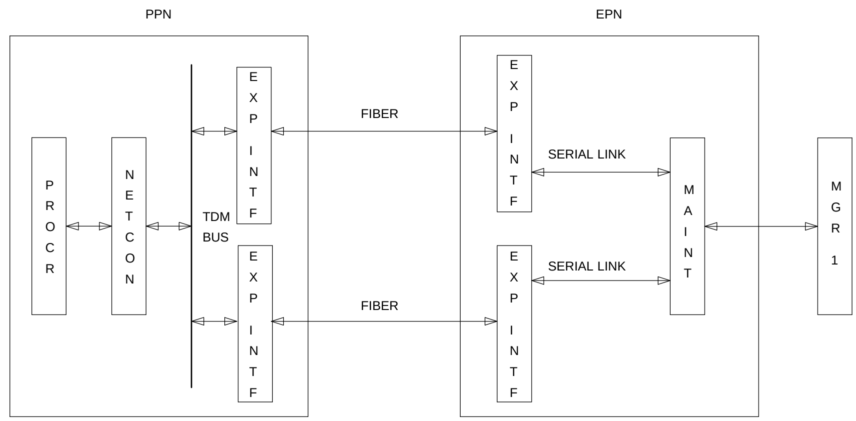

Figure 11-34. Expansion Interface Link Connectivity Between PPN and EPN [G1]

To determine which Expansion Interface Link is active and which is standby for each Expansion Interface pair, the **status system** command can be used. Alternately, visual inspection shows that the Active Expansion Interface circuit packs have the yellow LED on solid or blink a pattern two seconds on, 200 milliseconds off. See Table 11-152 for the possible Expansion Interface Yellow LED states. The Standby Expansion Interface circuit packs have the yellow LEDs off.

Table 11-152. Expansion Interface Circuit Pack Yellow LED Flashing Codes

Condition	LED on	LED off
Fiber Out-of-Frame (a)	0.1 sec	0.1 sec
In frame, No Neighbor (b)	0.5 sec	0.5 sec
Expansion Interface Active (c)	2 sec	0.2 sec
Expansion Interface Active (d)	solid on	never off
Expansion Interface Standby (e)	never on	solid off

Notes:

a. This flashing code corresponds to error codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes are usually accompanied by error code 1281 (no Expansion

Interface detected on opposite end of fiber). This condition may be caused by the absence of the opposite end Expansion Interface circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either Expansion Interface circuit pack.

b. This flashing code corresponds to error code 1281 from the Hardware Error Log and indicates a failure of Test #237. This condition is usually due to a failed Expansion Interface circuit pack on the opposite end of the fiber.

c. This is the normal state for an EPN Active Expansion Interface circuit pack that is also the bus master in the EPN.

d. This is the normal state for an Active Expansion Interface circuit pack that is not the bus master. It is also the state of the TN776 Expansion Interface circuit pack immediately after circuit pack initialization when the system has not yet assigned a role to it (that is, Active or Standby). To distinguish between these two situations, use the **status system** command. If the link which contains this Expansion Interface circuit pack is in-service (up), the Expansion Interface circuit pack is active; if it is out-of-service (down), the Expansion Interface circuit pack is neither active nor standby.

e. This is the normal state for a Standby Expansion Interface circuit pack. It is also the state of the TN570 Expansion Interface circuit pack immediately after circuit pack initialization when the system has not yet assigned a role to it (that is, Active or Standby). To distinguish between these two situations, use the **status system** command. If the link which contains this Expansion Interface circuit pack is in-service (up), the Expansion Interface circuit pack is standby; if it is out-of-service (down), the Expansion Interface circuit pack is neither active nor standby.

When testing Expansion Interface circuit packs to investigate problems, tests should always be run on both circuit packs of an Expansion Link. This provides a better indication of where a problem is located. Hardware errors for all Expansion Interface circuit packs (EXP-INTF) may be displayed by using the category "infc" on the Display Errors form.

In the EPN, the EPN TN775 Maintenance (MAINT) circuit pack monitors the sanity of the Expansion Interface circuit pack. If the Expansion Interface circuit pack should cycle between sane and insane several times, the Maintenance circuit pack holds the Expansion Interface circuit pack reset. If a new Expansion Interface circuit pack is installed in the EPN, the EPN Maintenance circuit pack should be removed because it may attempt to hold the new Expansion Interface circuit pack reset. The Maintenance circuit pack may be reinstalled after the Expansion Interface circuit pack has been inserted and the Expansion Interface circuit pack's red LED has gone off.

The Active Expansion Link is also involved in synchronization between the two cabinets. The Expansion Interface circuit pack reports slip errors if the two cabinets are not correctly synchronized. When diagnosing synchronization problems, the Expansion Interface circuit packs should be examined as a possible cause.

Relationship Between Expansion Interface and Tone-Clock Circuit Packs

The Expansion Interface fiber link depends on the system clock that is provided by the Active Tone-Clock circuit pack on each network. (See TDM-CLK and TONE-BD Maintenance documentation.) Each Expansion Interface circuit pack transmits over the fiber at a rate derived from the system clock on its network. If the Active Tone-Clock is defective to the point where the system clock frequency it produces is out of the specified range ("out of spec"), an Expansion Interface Link might go down even though the Expansion Interface circuit packs are healthy. In a High or Critical Reliability system, both links could go down if there is a defective Active Tone-Clock.

Whether or not a link goes down, depends on certain characteristics of the Expansion Interface circuit packs. An Expansion Interface circuit pack should not be replaced if the link on which it resides goes down because of a defective Active Tone-Clock circuit pack. The defective Tone-Clock circuit pack should be replaced instead. The Expansion Interface circuit packs are more sensitive to a defective system clock than the rest of the components of the system. Therefore, testing of the Tone-Clock circuit pack might not reveal a problem.

The symptoms of the problem in which an invalid system clock causes an Expansion Link to go down are as follows:

1. If the Active PPN Tone-Clock circuit pack is providing an invalid system clock:
   a. The EPN Expansion Interface circuit pack yellow LED blinks quickly.

      (Fiber Out-of-Frame condition from Table 11-152 on page 11-779).

      If the EPN is up, Test #238 fails on this Expansion Interface circuit pack.
   b. The PPN Expansion Interface circuit pack yellow LED blinks slowly.

      (In-frame, No Neighbor condition from Table 11-152 on page 11-779).

      Test #237 fails on this Expansion Interface circuit pack, but Test #238 passes.
2. If the EPN Tone-Clock circuit pack is providing an invalid system clock:
   a. The PPN Expansion Interface circuit pack yellow LED blinks quickly

      (Fiber Out-of-Frame condition from Table 11-152 on page 11-779).

      Test #238 fails on this Expansion Interface circuit pack.
   b. The EPN Expansion Interface circuit pack yellow LED blinks slowly

      (In-frame, No Neighbor condition from Table 11-152 on page 11-779).

If the EPN is in-service, Test #237 fails on this Expansion Interface circuit pack, but Test #238 passes.

These symptoms can also be the result of other problems (for example, one half of the fiber being unable to transmit data). If the system exhibits these symptoms, execute the following procedure:

1. Verify that the EPN stays down for at least one minute.

   If the Expansion Interface Link comes back in service after a short time, without switching the Active Tone-Clock, the problem probably was the on-line synchronization source became invalid (see SYNC Maintenance documentation for more information).

   However, if the Expansion Interface Link(s) has not come back into service after one minute, the synchronization source is not the cause of the problem. Proceed to Step 2.

2. Check for errors via the **display errors** command with the Category field set to "tone" and the Active alarms field set to "n." Some of the alarms on EPN objects might have been resolved if the EPN went down. Refer to the appropriate MO Maintenance documentation for descriptions of any of the errors occurring at about the same time as the EXP-LINK errors. Resolve any active alarms. Also, if Error Type 18 was logged against the SYNC MO when the EPN went down, the problem was probably that the synchronization on-line reference became invalid. Since reference switching was disabled, the Tone-Clock did not switch from the invalid reference. Therefore, the Tone-Clock circuit pack put out a system clock that was "out of spec." Issue the **enable synchronization-switch** command. If the EPN is down, reseat the Tone-Clock circuit packs on the EPN. This action should restore the EPN to service.

   Execute Steps 3 and 4 in the order most convenient to you and least destructive to the customer.

3. Check if the fiber optic cable is transmitting properly via the following procedure on one of the out-of-service links:

   a. Carefully record the symptoms (yellow LED pattern and tests failing) that were occurring on the PPN Expansion Interface circuit pack and the EPN Expansion Interface circuit pack. Clearly indicate which symptoms are occurring on which Expansion Interface circuit pack.

   WARNING:
   Before proceeding, note which is the current transmit fiber and which is the current receive fiber for proper reconnection.

   b. Disconnect the transmit and receive fiber pair from the lightwave transceiver on the back of the PPN Expansion Interface circuit pack slot (see Figure 11-35 on page 11-786).

   c. Connect what was formerly the transmit fiber to the receive jack.

d. Connect what was formerly the receive fiber to the transmit jack.

e. Perform Steps b, c, and d on the opposite end of the fiber and the lightwave transceiver on the back of the EPN Expansion Interface circuit pack slot.

NOTE:
If it is more convenient for you, execute Steps b, c, and d on the EPN Expansion Interface circuit pack first.

f. If the symptoms which were formerly occurring on the PPN Expansion Interface circuit pack are now occurring on the EPN Expansion Interface circuit pack and vice versa, the fiber is defective and should be replaced.

4. Determine if the problem is due to a defective Active Tone-Clock circuit pack. Refer to the preceding list of symptoms to decide which network contains the suspect Active Tone-Clock. See Warning.

WARNING:
If you remove the EPN Expansion Interface circuit pack that is active or that was active when the EPN was last in-service, then the 2A/3A Tone-Clock circuit pack becomes the Active Tone-Clock. This characteristic can be deceiving. Replacing or reseating the Active EPN Expansion Interface circuit pack might restore the Expansion Interface Links temporarily. However, if the 2B/3B Tone-Clock circuit pack was really the source of the problem and not the Expansion Interface circuit pack, then the Expansion Interface Link(s) goes down again the next time a Tone-Clock switch to the 2B/3B Tone-Clock is attempted (probably when the scheduled Tone-Clock switch occurs).

WARNING:
If, after all the Expansion Interface Links are restored, you suspect the problem might have been due to a defective Tone-Clock circuit pack, switch to this Tone-Clock at an appropriate time. If the Tone-Clock circuit pack was the cause of the problem and the same Expansion Interface circuit packs are in place, the same Expansion Interface Link(s) goes down again.

a. On a High or Critical Reliability system in which the network containing the suspect Tone-Clock circuit pack is in-service:

Switch to the Standby Tone-Clock on this network. If the suspect Tone-Clock circuit pack is defective, the Expansion Interface Link(s) should be restored to service at this point. Switching back to the defective Tone-Clock should make the same Expansion Interface Link(s) go out-of-service. Such a Tone-Clock circuit pack is defective and should be replaced as soon as possible. If switching Tone-Clocks does not bring up the EPN, then this Tone-Clock is not the source of the problem. Make sure to switch back to the original Tone-Clock.

WARNING:
If the defective Tone-Clock circuit pack is left as the Standby Tone-Clock, then a scheduled Tone-Clock switch causes the same Expansion Link(s) to go out-of-service again.

b. On a system in which the EPN containing the suspect Tone-Clock circuit pack is out-of-service:

   Replace the Active Tone-Clock circuit pack on this network. In a High or Critical Reliability system, the Active Tone-Clock is the Tone-Clock circuit pack whose yellow LED is: 1) blinking and 2) blinking slower if both Tone-Clocks have blinking yellow LEDs. If the Expansion Interface Link(s) comes up after replacing this Tone-Clock circuit pack, then this Tone-Clock circuit pack should be replaced as soon as possible. See Warning.

WARNING:
If the defective Tone-Clock circuit pack is left as the Standby Tone-Clock, then a scheduled Tone-Clock switch causes the same EPN to go out-of-service again.

   If replacing the Active Tone-Clock did not bring up the Expansion Interface Link(s), then this Tone-Clock circuit pack is not the source of the problem.

c. On a standard system in which the PPN contains the suspect Tone-Clock circuit pack:

   Replace the PPN Tone-Clock circuit pack **at a time when bringing down the system is most convenient to the customer**.

WARNING:
Replacing the PPN Tone-Clock circuit pack stops call processing on that network and also brings down stable calls. This action eventually causes a Reset System 2 (Cold 2 restart).

   If replacing the Tone-Clock circuit pack restores the Expansion Interface Link(s), then the Tone-Clock circuit pack is defective and should be replaced. Otherwise, the problem is not with the PPN Tone-Clock circuit pack.

Expansion Interface Manual Loop Back Procedure

This procedure is to be used when an Expansion Interface circuit pack cannot be tested by software. This is usually when the Expansion Interface circuit pack is in the EPN and the EPN is down. A spare length of fiber jumper cable is required for this procedure.

If this procedure is run on both Expansion Interface circuit packs of a link, and both check out fine, then the failure is most likely in the fiber itself if neither Expansion Interface circuit pack is busied out, but the link remains inactive.

1. Busyout the Expansion Interface circuit pack using the **busyout board PCSS** command.
2. Disconnect the transmit and receive fiber pair from the lightwave transceiver on the back of the Expansion Interface circuit pack slot. **Note which is the transmit fiber and which is the receive fiber for proper reconnection at the end of this procedure.**
3. Using a spare fiber jumper cable, interconnect the transmit and receive jacks of the lightwave transceiver as shown in Figure 11-35 on the following page.
4. Go to the front of the cabinet and inspect the yellow LED.
   - If the yellow LED is on steady, this Expansion Interface circuit pack and the lightwave transceiver are functioning properly.
   - If the yellow LED is off, reseat the circuit pack. For the TN776, if the yellow LED comes on steady after the red LED has gone off, the Expansion Interface circuit pack and the lightwave transceiver are functioning properly. For the TN570 [G1V5], if the yellow LED is off steady after the red and green LEDs have gone off, the Expansion Interface circuit pack and the lightwave transceiver are functioning properly.
   - If the yellow LED flashes on at a rate of once per second, the Expansion Interface circuit pack or transceiver should be replaced.
   - If the yellow LED flashes on at a rate of five times per second, the Expansion Interface circuit pack or the lightwave transceiver may need replacement. This condition may also be due to a faulty system clock on the network containing this Expansion Interface circuit pack. Refer to the procedure described in the preceding "Relationship Between Expansion Interface and Tone-Clock Circuit Packs" on page 11-781 section for further details.
5. Replace faulty component(s) and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in Step 3.
6. Release Expansion Interface circuit pack with the **release board PCSS** command.

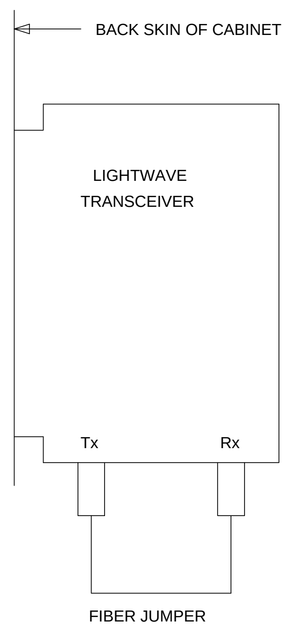

Figure 11-35. Interconnection of Lightwave Transceiver Transmit/Receive Jacks

Hardware Error Log Entries and Test to Clear Values

Table 11-153. Expansion Interface Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS
1	Any	Expansion Interface Local TDM Loop Around Test (#240)	MAJ	ON	test board PCSS r 2
2		Expansion Interface Local TDM Loop Around Test (#240)	MAJ	ON	test board PCSS r 2
18 (a)	0	busyout board PCSS	WRN	OFF	release board PCSS
23 (b)	0	None	WRN	OFF	
125 (c)		None	MIN	ON	
131 (d)		None	MINOR/ WARNING[2]	OFF	
257 (e)	Any	None	MINOR/ WARNING[2]	OFF	
513 (f)	5-7	None	MAJ	ON	
769	113	Expansion Interface FOOF Query Test (#238)	WRN	OFF	test board PCSS r 1
770		Expansion Interface FOOF Query Test (#238	WRN	OFF	test board PCSS r 1
1025	Any	Expansion Interface Control Channel Test (#316)	MAJ	ON	test board PCSS r 1
1281		Expansion Interface Neighbor Query Test (#237)	MINOR/ WARNING[2]	OFF	test board PCSS r 1

Continued on next page

Table 11-153. Expansion Interface Circuit Pack Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1537		Expansion Interface 2-way Transmission Test (#241)	MAJ	OFF	test board PCSS r 4
1538 (g)		None	MIN	ON	
1793		Expansion Interface Lightwave Transceiver Loop Around Test (#242)	MAJ	ON	test board PCSS l r 1
2049 (h)	Any	Reset Test (#336)	MIN	ON	reset board PCSS r 1
2305 (i)	118	None	WRN	OFF	
2561[1] (j)	Any	None	MIN	ON	
2817[1] (k)	Any	None	MIN	ON	
3073[1]	Any	Expansion Interface Packet Interface Test (#589)	MIN	OFF	test board PCSS rep 3
3074[1] (l)	2	Expansion Interface Packet Interface Test (#589)	MINOR/WRN[2]	OFF	test board PCSS rep 3
3075[1] (l)	1	Expansion Interface Packet Interface Test (#589)	MINOR/WRN[2]	OFF	test board PCSS rep 3
3076[1]		Expansion Interface Packet Interface Test (#589)	MINOR/WRN[2]	OFF	test board PCSS rep 3
3330[1] (m)	Any	None	WRN	ON	
3585 (n)	0	None	WRN	OFF	
3841 (o)	Any	None	MIN	OFF	(See Note q.)
3842 (p)	Any	None	MIN	OFF	(See Note q.)
10000 (r)	0	None			

Continued on next page

Table 11-153. Expansion Interface Circuit Pack Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
10001 (s)	0	None			
10002 (t)	0	None			
10003 (u)	0	None			
10004 (v)	0	None			
11000 (w)	0	None			
11000 (x)	2	None			
11000 (y)	3	None			
11000 (z)	4	None			
11000 (aa)	5	None			
11000 (ab)	8	None			
11001 (ac)	0	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. Expansion Interface circuit pack has been busied out by system technician.

b. Expansion Interface circuit pack has been administered on the Circuit Pack form, but has not been physically inserted into the system. Insert the circuit pack.

c. A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

d. This alarm is raised after an Expansion Interface circuit pack has been removed from a slot for 11 minutes. The alarm is resolved when the Expansion Interface circuit pack is inserted into this slot. Another way to resolve or prevent this alarm is to use the **change circuit pack** command to remove the Expansion Interface circuit pack administrative entry for this slot after the Expansion Interface circuit pack has been removed from the slot. Or, if the circuit pack is in the system and the red LED is on, then follow the instructions for "Red (alarm)" in the "Control and Port Circuit Pack Status LEDs" section in Chapter 7, "LED Interpretation".

e. Error Type 257 with Aux Data 85 through 88 indicates that this Expansion Interface circuit pack is detecting incorrect data on the incoming fiber bit stream. The data is originating at the opposite Expansion Interface circuit pack. These errors could result from a bad timing reference on the network which contains the Expansion Interface circuit pack on the opposite end of the fiber. For example, if the error is logged against the 1B01 (PPN) Expansion Interface circuit pack, then the bad timing reference would be on the EPN. Look for EXP-INTF errors 2305, 769, or 770. Resolve these errors. If there are any TONE-BD, TDM-CLK, or SYNC errors, resolve these errors as well. Finally, if the errors continue to occur, perform the following procedure:

   1. If the Expansion Interface circuit pack reporting the error is part of the Active link and a Standby link exists, switch to the Standby link.
   2. Reset the Expansion Interface circuit pack at the opposite end of fiber.
   3. Issue the **test board PCSS repeat 10** command, where PCSS is the address of the EXP-INTF circuit pack reporting the error. If Tests #241 or #316 fail even once, follow the documentation procedures associated with the failures.
   4. Wait 15 minutes. Then check the Error Log to see if new errors of type 257 have been detected.
   5. If errors are present, reset the Expansion Interface circuit pack reporting the errors.
   6. Wait five minutes. Then check the Error Log to see if new errors of type 257 have been detected.
   7. If errors are present, replace the Expansion Interface circuit pack or transceiver at the opposite end of the fiber.
   8. Wait 15 minutes. Then check the Error Log to see if new errors of type 257 have been detected.
   9. If errors are present or if this error occurs intermittently (over one week’s time), replace the Expansion Interface circuit packs or transceivers on this link.

f. Error Type 513 with Aux Data 5 through 7 indicates an ON BOARD hardware failure of the circuit packs RAM or ROM. Replace the Expansion Interface circuit pack or transceiver.

g. Error Type 1538 indicates a hyperactive Expansion Interface circuit pack that is generating an abnormal amount of control messages to the TN777 Processor circuit pack. When this error was generated, the Expansion Interface was automatically reset by the system. If this system does not have duplicate Expansion Interface Links, service to the EPN is disrupted. If this system does have duplicate Expansion Interface Links, the system should have switched to the Standby Expansion Interface Link. Reset the Expansion Interface. If error 1538 is detected again, replace the Expansion Interface circuit pack or transceiver.

h. Error Type 2049 indicates that the last time the Expansion Interface circuit pack was reset, its initialization tests failed. The number in the Aux Data field is the error code with which Reset Test (#336) failed. Follow the procedure specified in the Reset Test (#336) FAIL section for this error code.

i. Error Type 2305 with aux data 118 indicates that the Expansion Interface circuit pack has detected slips on the incoming fiber data stream. Thus, the EPN and PPN are not synchronized. Examine the Error Log for any SYNC, TDM-CLK, TONE-BD, and DS1-BD errors. If these errors exist, refer to the appropriate Maintenance documentation for repair procedures. If the errors do not exist, refer to the SYNC (Synchronization) Maintenance documentation for general information on diagnosing synchronization problems. If there are no active Expansion Interface circuit pack errors with Error Types 769 and 770, Error Type 2305 is resolved when fewer than nine slips are detected in a 5- to 10-minute period (that is, Error Type 2305 is resolved within 10 minutes of the last slip.) If the Error Log has an active Expansion Interface error with type 769 or 770, then Error Type 2305 is resolved when Error Types 769 and 770 are resolved.

NOTE:
These errors may be ignored if they occur during clock interchanges.

j. Error Type 2561 indicates an on-board failure of Expansion Interface circuitry related to handling packet data from the fiber interface and from the Packet bus interface. If this error has generated a minor alarm, the Expansion Interface circuit pack or transceiver should be replaced.

k. Error Type 2817 indicates an on-board failure of Expansion Interface circuitry related to transmission of data to the fiber interface. If this error has generated a minor alarm, the Expansion Interface circuit pack or transceiver should be replaced.

l. Error Type 3074 and 3075 indicates failures of Expansion Interface circuit pack packet path tests. These packet path tests do exercise circuitry on both Expansion Interface circuit packs of the Expansion link. If Error Type 3075 is present without Error Type 3074, the fault most probably lies with the Expansion Interface circuit pack that reported the error. The Expansion Interface circuit pack or transceiver should be replaced. If Error Type 3074 exists with or without 3075, the fault is most probably on the neighbor of the Expansion Interface circuit pack that reported this error. The neighbor Expansion Interface circuit pack or transceiver should be replaced.

NOTE:
Certain Packet Bus failures can cause this error. In that case the EI is not defective. If PKT-BUS errors are also present, refer to Chapter 9, "Packet Bus Fault Isolation and Correction" and the PKT-BUS section

of Chapter 11 for fault isolation procedures. If PKT-BUS errors are not present and replacing the EI does not solve the problem this error can still be the result of a Packet Bus failure. Again, refer to Chapter 9, "Packet Bus Fault Isolation and Correction" and the PKT-BUS section of Chapter 11 for fault isolation procedures.

m. Error Type 3330 indicates a failure of a diagnostic component on the Expansion Interface circuit pack. The failed component does not impair service, but it may leave the Expansion Interface circuit pack in a state where the Expansion Interface circuit pack cannot detect errors.

n. Error Type 3585 indicates that the Expansion Interface circuit pack experienced a series of very short out-of-frame conditions within several minutes. This may indicate transmission difficulties over the fiber link. If this is a duplex system, and if no other alarms exist, the system should have switched away from the fiber link using this Expansion Interface circuit pack. If this condition ceases, the warning alarm should be resolved within 15 minutes. In the meantime, make sure all lightwave transceivers are firmly secured to the back of the cabinet. Thereafter, if the alarm is not resolved during the next four 15-minute segments, replace the following (the first after the first 15-minute segment, the second after the second 15-minute segment, etc.):

   1. Lightwave transceiver attached to the Expansion Interface reporting the alarm
   2. Lightwave transceiver on the opposite end of the fiber
   3. Expansion Interface board reporting the alarm
   4. Expansion Interface board on the opposite end of the fiber

   Since the counter is active only due to a transient condition, there is no test that can be run to clear the counter. However, the counter is automatically decremented by one every five minutes. Once the condition causing the transient Fibers Out-of-Frame (FOOFs) has been fixed, it will take 15 minutes for the counter to be cleared if the alarm was raised.

o. Error Type 3841 indicates that the Expansion Interface (TN570 only) has reported a loss of lock with the backplane system clock.

p. Error Type 3842 indicates that the test that queries the Expansion Interface (TN570 only) for the state of the lock to the system clock has failed. This means that a loss of lock condition is present. A link switch is then attempted, and the alarm is raised. When both links report this error, the link switch is not attempted because, in this case, the problem is more likely to occur with the backplane clock than with the Expansion Interface circuit pack.

q. The counter associated with Error Types 3841 and 3842 is cleared when the query for the state of the lock-to-system-clock passes. Once the alarm is raised, this test is run every five minutes. However, the test is not part of any sequence that can be run on demand.

r. Error Type 10000 is a report from the Expansion Interface circuit pack that its internal data has become corrupted. The Expansion Interface circuit pack has lost track of control messages destined for the EPN. When this error is detected, the system automatically resets the Expansion Interface circuit pack and brings the EPN down. Service to the EPN is unavailable for several minutes after detection of this error. No system technician action is required.

s. Error Type 10001 is a report that the Expansion Interface circuit pack dropped one control message to the EPN. This condition may have been observed as a call that did not complete correctly. No system technician action is required.

t. In response to Error Type 10002, the system denied all calling services for up to 10 seconds.

   If Expansion Interface Error Type 257 is logged at the same time against an Expansion Interface circuit pack on this link, first try to resolve this error. The error associated with Error Type 257 could be the cause of this error.

   If Error Type 257 is not logged at the same time as this error, then Error Type 10002 indicates that heavy call traffic was encountered involving EPN endpoints.

   No system technician action is required; however, should this error recur frequently, the system should be examined for traffic engineering. The PPN and EPNs may not be equipped with sufficient trunks and Tone Detectors for the number of stations in each cabinet.

u. Error Type 10003 indicates that heavy call traffic involving EPN endpoints has returned to normal levels. This Error Type should always appear after Error Type 10002 or 10004. No system technician action is required.

v. Error type 10004 indicates that an extreme backup of traffic was present on the Expansion Interface circuit pack. The EPN served by this link was most probably not providing service when this error was logged. If this is a High or Critical Reliability system, the system should have switched to the Standby Expansion Link in order to restore service. Error type 11000 with an Aux value of 5 should have been logged against EXP-INTF to indicate this condition.

   In a standard system, the system should have reset the EPN in order to restore service. EXP-LINK Error Type 122 with an Aux value of 6 should have been logged to indicate this condition.

w. Error Type 11000 with an Aux value of 0 appears when an Expansion Interface Link switch takes place. Data calls between the PPN and EPN may have experienced some data loss or, in severe cases, the data calls may have dropped. The link that became active is the link with the circuit pack address given in the Error Log entry. The link switch may have occurred for several reasons:

   1. System Technician demanded the Expansion Interface Link switch. This can be verified by using the **list history** command.

2. The Expansion Interface Link switch may have been scheduled. Check the Maintenance-Related System Parameters form.
3. An Expansion Interface circuit pack error may have been detected. Examine the Error Log for other Expansion Interface circuit pack errors with the same approximate time as this error.
4. An EPN Maintenance circuit pack error may have been detected. Examine the Error Log for MAINT errors with the same approximate time as this error. MAINT Error Type 2561 indicates that the Active Expansion Interface circuit pack on the EPN could not communicate with the EPN Maintenance circuit pack. MAINT Error Type 3329 means the EPN Maintenance circuit pack cannot talk to the EPN Expansion Interface circuit pack in the A carrier. MAINT Error Type 3585 means the EPN Maintenance circuit pack cannot talk to the EPN Expansion Interface circuit pack in the B carrier.
5. Synchronization (SYNC) maintenance may have detected an inability of the Active Expansion Interface Link to provide synchronization between cabinets. Examine Error Log for SYNC Error Type 2305 with the same approximate time as this error.

x. Error Type 11000 with an Aux value of 2 appears when a system technician-demanded Expansion Interface Link Switch is issued. No further action is required.

y. Error Type 11000 with an Aux value of 3 appears when a scheduled Expansion Interface Link Switch has occurred. No further action is required.

z. Error Type 11000 with an Aux value of 4 appears when an Expansion Interface Link Switch has occurred due to a Special EPN recovery strategy. The software has forced an Expansion Interface switch because the new Expansion Interface Link contains new features which support EPN recovery in case of a bad tone/clock board. This error code appears when there is a periodic/scheduled tone/clock switch.

aa. Error Type 11000 with an Aux value of 5 appears when the system has detected an excessive backup of traffic on the Active Expansion Link. This condition may have been due to communication difficulties on the Expansion link. To restore normal service, the system switched Expansion Links to the link identified in the Error Type 11000 with an Aux Data value of 5. Error Type 10004 should be present against the Expansion Interface circuit pack that reported the traffic congestion.

ab. Error type 11000 with an Aux value of 8 indicates that the Expansion Interface link was switched as part of the recovery action taken by EPN-SNTY. This error should be accompanied by EPN-SNTY error 8802 0. If EPN-SNTY error 9902 0 is also present, this indicates that the switching of the Expansion Interface link was the recovery action that restored sanity to the EPN. In this case, the fault was with the link that was switched away from. The relevant Expansion Interfaces and connections should be tested and examined to determine the cause of the problem. Look for EPN-SNTY errors in the error log, and refer to the EPN Sanity Audit (EPN-SNTY) section for more details.

ac. Error Type 11001 occurs when an Expansion Link switch was attempted but for unknown reasons could not be completed.

Expansion Interface LED Usage

The Expansion Interface circuit pack has the standard red, green, and yellow LEDs. The red and green LEDs have the traditional use, where red means some alarm condition and green indicates maintenance testing in progress. The yellow LED is used to provide useful visual status information. The state of the yellow LED is very important when executing the Expansion Interface Manual Loop Back Procedure previously described. The possible yellow LED states are shown in Table 11-152 on page 11-779.

Upon power-up, the TN776 red LED comes on and off, followed by the yellow LED coming on solid. The TN570 red and green LEDs comes on and off. The yellow LED remains off.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Expansion Interface Reset Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Expansion Interface Reset Test (#336)			D
Expansion Interface Fiber Out-of-Frame Query Test (#238)	X	X	ND
Expansion Interface Lightwave Transceiver Interface Loop Around Test (#242)		X	D
Expansion Interface Control Channel Test (#316)	X	X	ND
Expansion Interface Neighbor Query Test (#237)	X	X	ND
Expansion Interface Local Loop Around Test (#240)	X	X	ND
Expansion Interface 2-Way Transmission Test (#241)	X	X	ND
TN570 Expansion Interface Packet Interface Test (#589)	X	X	ND

1 D = Destructive; ND = Nondestructive

Expansion Interface Neighbor Query Test (#237)

The Expansion Interface Neighbor Query Test is a request to an Expansion Interface circuit pack to determine if it has established communication with the Expansion Interface circuit pack on the opposite end of the fiber.

Table 11-154. TEST #237 Expansion Interface Neighbor Query Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Someone may be doing something on this Port Network Interface. 1. Retry the command at 1-minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
2027	FAIL	The Expansion Interface circuit pack has contact with the opposite Expansion Interface circuit pack, but it is the incorrect Expansion Interface circuit pack. 1. Check Expansion Interface circuit packs and lightwave transceivers to verify that they are placed in the correct slots described above. 2. If working with duplicate Expansion Interface Links, check for crossed fiber pairs such as 1A01 connected to 2B02 or 1B01 connected to 2A01.

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Table 11-154. TEST #237 Expansion Interface Neighbor Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Expansion Interface circuit pack under test cannot make contact with opposite end Expansion Interface circuit pack. 1. If Test #238 passes (yellow LED not blinking at a rate of five times per second), the Expansion Interface circuit pack is detecting the framing signal and an Expansion Interface circuit pack is at least physically present on the opposite side. a. Reset the OPPOSITE Expansion Interface circuit pack using the **reset board PCSS** command where PCSS is the address of the OPPOSITE Expansion Interface circuit pack. b. If the reset command returns the message "EPN is unavailable," use the **change circuit-pack** command to add a TN776/TN570 Expansion Interface circuit pack to the correct EPN slot. Then, repeat the **reset board** command. c. If the reset command returns the message "Board not Assigned," the EPN Maintenance circuit pack may be holding the Expansion Interface circuit pack reset. First, try to reset the EPN Maintenance circuit pack using the **test maintenance long** command. Then, repeat the **reset board** command on the EPN Expansion Interface circuit pack. d. If the reset does not pass, refer to the Expansion Interface Reset Test (#336). e. If the reset passes, execute the **test board PCSS** command on the opposite Expansion Interface circuit pack. Resolve all problems on the opposite Expansion Interface circuit pack before proceeding. f. If this test still does not pass, try replacing the Expansion Interface circuit pack on which this test is failing. 2. If Test #238 fails (yellow LED is blinking at a rate of five times per second), refer to the procedures for Test #238.

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Table 11-154. TEST #237 Expansion Interface Neighbor Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Expansion Interface circuit pack has successfully established a link with the opposite Expansion Interface circuit pack. 1. If the **status system** command still indicates that this link is down, it is possible that one or both of the Expansion Interface circuit packs have been busied out. 2. If the link still does not come up, reset one or both Expansion Interface circuit packs on the link.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Fiber Out-of-Frame (FOOF) Query Test (#238)

This test is a request to an Expansion Interface circuit pack to determine if it is currently detecting the framing sequence on the incoming fiber data stream. If it cannot detect this framing signal, the Expansion Interface circuit pack is not able to establish a link with the opposite Expansion Interface circuit pack.

Table 11-155. TEST #238 Expansion Interface Fiber Out-of-Frame Query Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2026	ABORT	Expansion Interface circuit pack responded with an unknown reply. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, replace the circuit pack or transceiver.

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Table 11-155. TEST #238 Expansion Interface Fiber Out-of-Frame Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Expansion Interface circuit pack could not detect framing sequence. 1. Check if the Expansion Interface circuit pack on the opposite end of the fiber is present and if its cabinet has power. 2. Verify that the lightwave transceiver is connected to the correct slot on the back of the cabinet and that the fiber is connected to the lightwave transceiver. Verify this connection on both ends of the fiber. Check that an Expansion Interface circuit pack detects its lightwave transceiver by executing the **reset board PCSS** command, where PCSS refers to the Expansion Interface circuit pack. If the reset passes, the Expansion Interface circuit pack detects a lightwave transceiver. Refer to the description of the Expansion Interface Reset Test (#336) if the reset fails. 3. Verify that fiber transmit and receive ends have not been crossed when connected to the lightwave transceiver. 4. The problem may be due to a synchronization timing loop. Use the **status sync** command to determine which circuit pack is the synchronization reference. If the reference is a DS1 Interface circuit pack, use the **set sync** command to make a Tone-Clock circuit pack the reference. If this action causes the Expansion Interface to go into frame, synchronization must be examined for a possible timing loop. Refer to SYNC (Synchronization) Maintenance documentation for repair procedures. If the DS1 Interface circuit pack is not a reference, and the Expansion Interface circuit pack that is failing Test #238 is in the PPN, run tests on Tone-Clock circuit pack in the PPN to determine if clocks are present. If the Expansion Interface circuit pack that is failing Test #238 is in the EPN, and the red LEDs are ON on a large number of circuit packs, then reseat any Tone-Clock circuit packs in the EPN. *More information follows.*

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Table 11-155. TEST #238 Expansion Interface Fiber Out-of-Frame Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	5. Execute the **test tone-clock PC** command where P is the port network which contains the Expansion Interface circuit pack's neighbor Expansion Interface on the OPPOSITE end of the fiber and C refers to the carrier which contains the Active Tone-Clock on port network P. Also, look for SYNC errors in the Error Log. If there are any tests failing or errors found, resolve these problems and then rerun Test #238. If the test still fails and the system has a Standby Tone-Clock, switch the Active Tone-Clock on this network (**set tone-clock PC** command, where P is the port network containing the Expansion Interface circuit pack on the OPPOSITE end of the fiber and C is the carrier containing the Standby Tone-Clock). Also, if the EPN is down, replace the EPN Tone-Clock circuit pack in carrier A of the EPN. 6. Check for errors using the **display errors** command with the Category field set to "tone" and the Active alarms field set to "n." Some of the alarms on EPN objects might have been resolved if the EPN went down. Refer to the documentation for descriptions of any of the error types occurring at about same time as the EXP-LINK error types. Resolve any active alarms. Also, if Error Type 18 was logged against the SYNC MO when the EPN went down, the problem was probably that the Synchronization on-line reference became invalid. Since, reference switching was disabled, the Tone-Clock did not switch away from the invalid reference. Therefore, the Tone-Clock put out an "out-of-spec" system clock. Execute the **enable synchronization-switch** command. If the EPN is down, reseat the Tone-Clock circuit packs on the EPN. This action should restore the EPN to service. 7. Follow the procedure described in "Relationship Between Expansion Interface and Tone-Clock Circuit Packs" near the beginning of this section if the symptoms match those described there.

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Table 11-155. TEST #238 Expansion Interface Fiber Out-of-Frame Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Expansion Interface circuit pack has detected the valid framing signal on the fiber. 1. Refer to errors from other Expansion Interface circuit pack tests if the link is still not functioning.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Local Loop Around Test (#240)

This test is similar to the Lightwave Transceiver Loop Around Test described in Test #242. A test tone from TDM Bus A is received by the Expansion Interface circuit pack under test, but is not transmitted out to the lightwave transceiver before being looped back onto TDM Bus A again. The test is then repeated using TDM Bus B. Thus, this loop back test is performed on each TDM Bus on the network containing the Expansion Interface circuit pack to verify that the Expansion Interface circuit pack is able to loop back data on each TDM Bus. Since this loop back is internal to the circuit pack, this test does not interfere with the normal fiber data stream.

Table 11-156. TEST #240 Expansion Interface Local Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-156. TEST #240 Expansion Interface Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	ABORT	Could not allocate time slot on TDM Bus A. Loop back passed on TDM Bus B.
2	ABORT	Could not allocate time slot on TDM Bus B. Loop back passed on TDM Bus A. 1. If there is no reason to doubt that the Expansion Interface circuit pack can transfer data to or from a TDM Bus, then since the test passed on one bus, assume that the test passes on the other bus as well. 2. If EXP-INTF circuit pack Error Types 1, 2, 1537, or 1793 are present in the Error Log and/or if Expansion Interface circuit pack Tests #240, #241, or #242 have failed previously, there is reason to doubt that the Expansion Interface circuit pack can transfer data to or from a TDM Bus. To determine if the test can pass on both TDM Buses, perform the following procedure: For Error Code 1, issue the **set tdm PC** command, where P is the network containing the Expansion Interface circuit pack being tested and C is the TDM Bus A. Execute the **test board PCSS** command again. If this test passes or aborts with Error Code 2, this test is considered to have passed. For Error Code 2, issue the **set tdm PC** command, where P is the network containing the Expansion Interface circuit pack being tested and C is the TDM Bus B. Execute the **test board PCSS** again. If this test passes or aborts with error code 1, this test is considered to have passed. 3. If this test continues aborting with the same error after setting the TDM Bus as indicated in Step 2, rerun the test at one-minute intervals a maximum of five times. Apply the passing criteria for Step 2 to each result. 4. If the test still does not pass on the other TDM Bus, follow the procedure for abort error code 3.

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Table 11-156. TEST #240 Expansion Interface Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	ABORT	The system could not allocate time slots for the test on either TDM Bus. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Enter **display errors** and follow associated repair procedures for TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 3 times. 2. If test continues to abort, follow normal escalation procedures.
1002	ABORT	The system could not allocate time slots for the test on either TDM Bus. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-156. TEST #240 Expansion Interface Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If these errors are present, refer to TTR-LEV (TTR Level) Maintenance documentation. Even if there are no TTR-LEV errors, there still may not be a Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. If not, this test always aborts for this Expansion Interface circuit pack. This does not harm the system in any way. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1031	ABORT	A query of the Expansion Interface circuit pack aborted. The purpose of this query was to see if the Expansion Interface circuit pack could detect the framing signal. 1. If Test #238 aborted, follow the procedure associated with this abort code. 2. If Test #238 did not abort, rerun Test #240 at one-minute intervals a maximum of five times. 3. If Test #240 continues to abort without Test #238 aborting, escalate the problem.
1032	ABORT	The Expansion Interface circuit pack cannot detect the framing signal and cannot run the test. 1. Refer to the errors for Test #238 to determine why the Expansion Interface circuit pack is out-of-frame.

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Table 11-156. TEST #240 Expansion Interface Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	Loop back on TDM Bus A failed. Loop back on TDM Bus B passed.
2	FAIL	Loop back on TDM Bus B failed. Loop back on TDM Bus A passed.
3	FAIL	Loop back on both TDM Busses failed.
12	FAIL	Loop back on TDM Bus B failed. Loop back TDM Bus A aborted because the system could not allocate time slots.
21	FAIL	Loop back on TDM Bus A failed. Loop back on TDM Bus B aborted because the system could not allocate time slots.
	FAIL	The test tone was not detected correctly after being looped through the Expansion Interface circuit pack. 1. If error type 2305 has been logged against the Expansion Interface circuit pack in the last 5 minutes, this test could have failed due to the associated slips. If this is the case, first resolve the 2305 error, and then repeat test. 2. Run the tests for the Active Tone-Clock on the Port Network that contains the indicted Expansion Interface circuit pack to verify that dial-tone is being supplied. 3. If the tone-clock is healthy, repeat the short test on the Expansion Interface circuit pack. 4. If this test continues to fail, replace Expansion Interface circuit pack.
	PASS	Test tone was correctly detected after the internal Expansion Interface loop back on both TDM Busses. 1. Refer to other Expansion Interface circuit pack tests if the Expansion Interface Link is not functioning correctly.

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Table 11-156. TEST #240 Expansion Interface Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface 2-Way Transmission Test (#241)

This test is a basic connectivity test between the two cabinets. The test first sends a test tone from the cabinet of the Expansion Interface circuit pack under test through the opposite Expansion Interface circuit pack to a Tone Detector in the opposite cabinet. The connections are then reversed and the tone is passed in the opposite direction. This test should be run once from each Expansion Interface circuit pack on the fiber.

Table 11-157. TEST #241 Expansion Interface 2-Way Transmission Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-157. TEST #241 Expansion Interface 2-Way Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. Even if there are no TTR-LEV errors, there still may not be a Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. If there is not at least one Tone Detector, this test always aborts for this Expansion Interface circuit pack. This does not harm the system in any way. **NOTE:** G3 systems require that Tone Detector circuit packs (TN768) must be of vintage "B" or newer. If older Tone Detector circuit packs are installed in the system, this test well always abort with this abort code. 2. Look for TONE-PT errors in the Hardware Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1033	ABORT	The test cannot run because either one or both of the Expansion Interface circuit packs on this link are busied out or an Expansion Interface circuit pack is not present on the opposite end of the fiber. 1. If Expansion Interface is busied out, issue the **release board PCSS** command. 2. Examine results of Tests #237 and #238.

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Table 11-157. TEST #241 Expansion Interface 2-Way Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 3 retries. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals for a maximum of 3 retries. 2. If the test continues to abort, escalate the problem.
	FAIL	The test tone was not detected correctly in either direction. 1. Run the test for the Active Tone-Clocks on the Port Networks for which the Expansion Interface circuit pack under test provides a link. This will determine if the dial tone is being supplied. 2. Check for disconnected transmit or receive fiber on both ends of the fiber. Make sure both endpoint circuit packs are inserted and have no on-board alarms. 3. If this test continues to abort, follow normal escalation procedures.

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Table 11-157. TEST #241 Expansion Interface 2-Way Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 or 2	FAIL	The test tone was detected correctly in only one direction. 1. Run the test for the Active Tone-Clocks on the Port Networks for which the defective Expansion Interface circuit pack provides a link. This determines if the dial tone is being supplied. 2. Check for disconnected transmit or receive fibers on both ends of the fiber. 3. If Test #238 is failing, refer to procedures for Test #238. 4. If Error Type 2305 has been logged against this Expansion Interface circuit pack, or the Expansion Interface circuit pack on the opposite end of its fiber, in the last five minutes, this test may have failed due to the associated slips. If such errors exist, first resolve them, and then repeat this test. 5. Execute the **test board PCSS long** command on both Expansion Interface circuit packs and follow procedures for Test #242 to determine if the problem lies with one of the Expansion Interface circuit packs, the lightwave transceivers, or the fiber itself.
	PASS	The tone was successfully transmitted in both directions. Both Expansion Interface circuit packs and their lightwave transceivers are functioning properly.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Lightwave Transceiver Loop Around Test (#242)

This test is destructive and requires that the Expansion Interface circuit pack first be busied out. Busying out an Expansion Interface circuit pack denies service to the EPN if the Expansion Interface circuit pack supports a PPN to EPN link and duplicate Expansion Interface Links are not in use. If the Expansion Interface circuit pack is part of an EPN to EPN link, service between the two EPNs are denied if duplicate Expansion Interface links are not in use. This test is NOT DESTRUCTIVE if the Expansion Interface circuit pack to be busied out is in Standby Mode.

This is a two part connectivity test. The first portion of the test applies to both TN776 and TN570 Expansion Interface circuit packs. In the first part of the test, a test tone is transmitted from the cabinet of the Expansion Interface circuit pack under test, through the Expansion Interface circuit pack under test, out to its lightwave transceiver. The connection then loops back into the lightwave transceiver through the same Expansion Interface circuit pack again and into the originating cabinet. If the test tone is detected by a tone detector, the first part of the test passes.

The second portion of the test applies only to the TN570 Expansion Interface circuit pack. In this part of the test, a data packet is sent from the TN778 Packet Control circuit pack to the Expansion Interface circuit pack under test; the packet is then looped back through the lightwave transceiver and sent back to the Packet Control circuit pack. If the Packet Control circuit pack receives the same packet it transmitted, the second part of the test passes. If the entire test has passed, the Expansion Interface circuit pack, its backplane wiring, and the electrical portion of the lightwave transceiver are healthy.

NOTE:
When the Expansion Interface circuit pack under test is an EPN, the data packet must also pass through the Active Expansion Interface circuit packs of the Active link connecting the EPN to the PPN.

This test requires the Expansion Interface circuit pack to ignore incoming data from its neighbor Expansion Interface circuit pack on the opposite end of the fiber. Thus, this test disturbs any inter-cabinet connections that currently exist and disrupts signaling between the two cabinets.

Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Hardware Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. Even if there are no TTR-LEV errors, there still may not be a Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. If there is not at least one Tone Detector, this test always aborts for this Expansion Interface circuit pack. This does not harm the system in any way. 2. Look for TONE-PT errors in the Hardware Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	The system does not allow this test to be run because the Expansion Interface circuit pack has not been busied out. 1. Busyout the Expansion Interface circuit pack. Repeat the **test board PCSS long** command.
1031	ABORT	If the Expansion Interface circuit pack is in an EPN and is active and is in slot A01 or B02, this test CANNOT be executed. If the lightwave transceiver loop around is activated, it is impossible to deactivate it. 1. If a Standby Expansion Interface circuit pack pair exists, make that pair active via the **set expansion-link PCSS** command, where PCSS is the address of a Standby Expansion Interface circuit pack. 2. If the Expansion Interface Link switch is successful, the lightwave transceiver Loop Around Test may now be executed on the original Expansion Interface circuit pack in the EPN.
1139	ABORT	The Packet Bus in an Expansion Port Network (Port Network 2 or 3) has a major alarm against it. This test needs to use the alarmed port network's Packet Bus. 1. Resolve the Packet Bus alarm. 2. Retry the command.
1141	ABORT	The Packet Control circuit pack is out-of-service. 1. Determine if the Packet Control circuit pack is busied out by checking the Hardware Error Log to see if Error Type 18 has been logged against PKT-CTRL. If Error Type 18 is present, release the circuit pack via the **release packet-control** command, and retry the command. 2. If the Packet Control circuit pack is NOT busied out, refer to PKT-CTRL (Packet Control circuit pack) Maintenance documentation for the recommended repair procedure.

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Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1144	ABORT	The Packet Bus in the Processor Port Network has a major alarm active against it. This abort code only appears when the test is run in an EPN. 1. Resolve the alarm in the PPN. 2. Retry the command.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2060	ABORT	The link on the Packet Bus being used to perform the test has failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, check for problems with the Packet Control circuit pack (look for PKT-CTL errors). 3. If there is no problem with the Packet Control circuit pack, escalate the problem.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The test did not detect the test tone through the loop around connection. **NOTE:** If the circuit pack is a TN570, the packet portion of this test was not run since the circuit portion failed. 1. Test the Active Tone-Clock on the Port Network that contains the defective Expansion Interface circuit pack to verify that dial tone is being supplied. 2. If the Tone-Clock is healthy, issue the **test board PCSS long** command on the Expansion Interface circuit pack. 3. If this test continues to fail, replace the Expansion Interface circuit pack or transceiver. Then, reissue the **test board PCSS long** command on the new Expansion Interface circuit pack.
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the TN778 Packet Control circuit pack. This error only applies to the TN570 Expansion Interface circuit pack. 1. Test the TN778 Packet Control circuit pack to verify that it is functioning properly. If any tests fail, investigate those tests and repair the Packet Control circuit pack. 2. If the Packet Control circuit pack checks out OK, issue the **test board PCSS long** command on the Expansion Interface circuit pack. 3. If Test #242 continues to fail, replace the Expansion Interface circuit pack. Then, issue the **test board PCSS long** command on the new Expansion Interface circuit pack. 4. If Test #242 continues to fail, replace the lightwave transceiver, reset the circuit pack and issue the **test board PCSS long** command on the Expansion Interface circuit pack.

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Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	**NOTE:** If the Expansion Interface is a TN570 and the system does not have the Packet Bus enabled field set to yes on the Maintenance-related system parameters form, then this test does not execute the packet bus portion of the loop around. When this test (#242) and the Expansion Interface Local Loop Around Test #240 pass, this indicates that the Expansion Interface circuit pack is functioning properly, but it does not verify that the optical portion of the lightwave transceiver is functioning properly. Remove the Expansion Interface circuit pack from the busyout state using the **release board PCSS** command. 1. If duplicate Expansion Interface Links are available, issue the **test board PCSS** command on the Standby Expansion Interface circuit packs on both ends of fiber. If this test passes from both sides, but other tests fail, such as Test #241, this condition indicates either a faulty lightwave transceiver or a faulty fiber cable. To determine if either a lightwave transceiver or the fiber itself has failed, execute the Expansion Interface Manual Loop Back Procedure described in the section preceding the "Hardware Error Log Entries and Test to Clear Values" table for this MO. **NOTE:** This test can only be run from both Expansion Interface circuit packs if they are the Standby pair, and if the Active pair is working properly.

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Table 11-158. TEST #242 Expansion Interface Lightwave Transceiver Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2 *(cont'd.)*	PASS *(cont'd.)*	2. If this Expansion Interface circuit pack is failing other tests, the Expansion Interface Manual Loop Back Test should be executed. If problems still exist after the Expansion Interface Manual Loop Back Procedure indicates that both Expansion Interface circuit packs and both lightwave transceivers are healthy, manually check out the building fiber. Verify that each optical fiber is connected to a transmitter at one end and a receiver at the other.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Control Channel Test (#316)

If an Expansion Interface circuit pack is a Standby Expansion Interface circuit pack (yellow LED off) or if the Expansion Interface is active in the PPN (yellow LED on), this test queries the Expansion Interface circuit pack for its circuit pack type and vintage information. If the Expansion Interface circuit pack is an Active Expansion Interface circuit pack in the EPN (yellow LED on long, off short), the Expansion Interface Control Channel Test checks to see if the Expansion Interface circuit pack can communicate with other circuit packs in the EPN using the EPNTDM Bus.

Table 11-159. TEST #316 Expansion Interface Control Channel Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Expansion Interface circuit pack responded incorrectly or, if it is the EPN Active Expansion Interface circuit pack, it could not talk to EPN circuit packs. 1. If the Active Expansion Interface circuit pack in the EPN is failing and a Standby link exists, switch to the Standby link using the **set expansion-link PCSS** command. 2. Repeat the Short Test Sequence. 3. If test continues to fail, reset the Expansion Interface circuit pack via the **reset board PCSS** command. 4. If the Expansion Interface circuit pack in the EPN is failing, check for EPN TDM-CLK, TONE-BD, or SYNC failures in the Hardware Error Log. Clear any EPN clock-related failures and repeat the Short Test Sequence. 5. If test continues to fail, replace the circuit pack or transceiver.

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Table 11-159. TEST #316 Expansion Interface Control Channel Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Expansion Interface circuit pack did respond correctly to the test. Communication from software to the Expansion Interface circuit pack is functioning. 1. Refer to other Expansion Interface circuit pack tests if Expansion Interface Link is not functioning correctly.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Reset Test (#336)

This test is potentially very destructive and requires the Expansion Interface circuit pack to be busied out prior to execution of this test.

The Expansion Interface Reset Test, which is not a part of either the Short or the Long Test Sequences, is executed via the **reset board PCSS** command where PCSS is the address of the Expansion Interface circuit pack to be reset.

If the system only has one working Expansion Interface Link between a pair of port networks and one of the Expansion Interface circuit packs must be reset, the action of busying out the desired Expansion Interface circuit pack WILL DISRUPT SERVICE TO THE EPN until the Expansion Interface circuit pack is released from the busyout state. If the Expansion Interface circuit pack is part of a PPN to EPN link, the EPN WILL BE WITHOUT SERVICE. If the Expansion Interface circuit pack is part of an EPN to EPN link CALLS BETWEEN THE TWO EPNs WILL BE DENIED.

If the system has working duplicate Expansion Interface Links, and the Expansion Interface circuit pack to be reset is part of the Active Expansion Interface Link, the system does not allow the busyout and instructs system technician to switch Expansion Interface Links via the **set expansion-link PCSS** command where PCSS is the address of either Standby Expansion Interface circuit pack on the Standby link. After executing the Expansion Interface Link switch, it is possible to busyout and then reset the original Expansion Interface circuit pack.

However, if the EPN Maintenance (MAINT) circuit pack determines that the Expansion Interface (EXP-INTF) circuit pack is cycling between sane and insane several times within several minutes, MAINT may inhibit operation of the EXP-INTF by holding the Expansion Interface circuit pack in a reset state. This condition may result in an unsuccessful reset of the Expansion Interface circuit pack.

If the reset command returns with "EPN is unavailable," execute the following steps:

1. Use the **change circuit-pack P** command where P is the port network number of the EPN.
2. For the Expansion Interface circuit pack you wish to reset, add an entry to the Circuit Pack form for the TN776 or TN570 Expansion Interface circuit pack. Be sure to enter the appropriate carrier and slot (that is, A01 or B02).
3. Enter the form.
4. Repeat the **reset board** command.

Table 11-160. TEST #336 Expansion Interface Reset Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
4	ABORT	Could not reset EPN Expansion Interface circuit pack over optical fiber since PPN Expansion Interface circuit pack on opposite end of fiber is not inserted. 1. Insert opposite Expansion Interface circuit pack and perform reset again.
1015	ABORT	The system does not allow this test to be run because the Expansion Interface circuit pack has not been busied out. 1. Busyout the Expansion Interface circuit pack. Repeat the **reset board PCSS** command.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
9999	ABORT	Expansion Interface circuit pack reset successfully. Could not perform initialization test results query because link to EPN is not up. 1. Execute **release board PCSS**. Wait one minute. Issue the **display error** command. If you see Error Type 2049 logged against this Expansion Interface circuit pack, then the Expansion Interface Reset Test has failed with an error code equal to the aux data of this entry. Otherwise, the initialization tests have passed.
12000	ABORT	Expansion Interface circuit pack reset successfully. Response to the initialization test results query was not received within the allowable time period.

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Table 11-160. TEST #336 Expansion Interface Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
12100	ABORT	Expansion Interface circuit pack reset successfully. System resources required to run initialization test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
12026	ABORT	Expansion Interface circuit pack reset successfully. It responded with an unknown reply to the query for the results of its initialization tests. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, replace the circuit pack or transceiver.
1	FAIL	The Expansion Interface did not successfully reset. 1. If the Expansion Interface circuit pack is in the EPN, the EPN Maintenance Board may be holding the Expansion Interface circuit pack reset. Attempt to rectify this condition by executing the **test maint P long** command on the maintenance board in the same EPN. 2. If Step #1 was not successful in releasing the Expansion Interface circuit pack, temporarily remove the EPN maintenance circuit pack. 3. Repeat the **reset board PCSS** command. 4. If reset continues to fail, replace circuit pack. 5. Insert EPN maintenance circuit pack if it was removed.
2	FAIL	The Expansion Interface circuit pack was successfully reset, but it did not begin running after the reset. 1. If the Expansion Interface circuit pack is in the EPN, temporarily remove the EPN maintenance circuit pack. 2. Repeat the **reset board PCSS** command. 3. Re-insert the EPN maintenance circuit pack if it was removed.

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Table 11-160. TEST #336 Expansion Interface Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	The reset over the optical fiber failed. 1. Execute the **test board PCSS** command on the PPN neighbor Expansion Interface circuit pack located on the opposite end of the fiber from this Expansion Interface circuit pack. If Test #238 does not pass, follow the maintenance procedure associated with this test result. Then perform the reset again. 2. If the Expansion Interface circuit pack is in the EPN, temporarily remove the EPN Maintenance circuit pack. 3. Repeat the **reset board PCSS** command. 4. Reinsert EPN Maintenance circuit pack if it was removed. 5. Follow the procedure described in the "Relationship Between Expansion Interface and Tone-Clock Circuit Packs" section if the symptoms match those described there. 6. Check the Hardware Error Log for the EPN Tone-Clock errors that were resolved about when the EPN went down. These EPN Tone-Clock errors may have been resolved BECAUSE the EPN went down. When there is no Tone-Clock generating the system clock on an EPN, then an Expansion Interface circuit pack can only be reset once. All subsequent reset attempts fail. It is also possible that the system itself may have already tried to reset the Expansion Interface circuit pack. Refer to the TONE-BD (Tone-Clock) Maintenance documentation for recommended maintenance strategy for Tone-Clock problems.

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Table 11-160. TEST #336 Expansion Interface Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3 *(cont'd.)*	FAIL *(cont'd.)*	7. If the reset still fails, execute the Manual Loop Back Procedure on the opposite PPN Expansion Interface circuit pack. This procedure is described in the section preceding the "Hardware Error Log Entries and Test to Clear Values" table for this MO. If the Expansion Interface circuit pack and the lightwave transceiver are healthy, the problem must lie with the Expansion Interface circuit pack and its lightwave transceiver on the EPN end of the fiber or with the fiber itself. Test the EPN Expansion Interface circuit pack with the manual loop back procedure and investigate the test results.
5001	FAIL	**Initialization failure:** Expansion Interface circuit pack reset successfully and restarted execution. But the Expansion Interface circuit pack could not synchronize itself during the self-test phase of the hardware initialization. 1. Issue the **reset board PCSS** command. If the circuit pack is on the Active link, this procedure can be very destructive. If a **test board PCSS** shows all the tests passing, and there is no Standby link to which you can switch, perform this reset at a time when service is least disrupted by losing use of the EPN. 2. If the reset fails with the same error code, execute the **test tone-clock PC** command where P is the network that contains this Expansion Interface circuit pack and C is the carrier that contains the Active Tone-Clock on network P. Also look for SYNC and TONE-BD errors. Resolve any SYNC and TONE-BD errors by following the Maintenance documentation for these MOs. Then reissue the **reset board PCSS** command. 3. If the Expansion Interface circuit pack still fails to reset with the same error code, replace the Expansion Interface circuit pack.

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Table 11-160. TEST #336 Expansion Interface Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5002	FAIL	**Initialization failure:** Expansion Interface circuit pack reset successfully and restarted execution. But the Expansion Interface circuit pack has determined that a lightwave transceiver was not attached to the backplane connector when the Expansion Interface circuit pack was last reset. If this system does not have duplicate Expansion Interface Links, all users in the EPN will be without service until this problem is resolved. If this system does have duplicate links, the backup Expansion Interface Link will be unavailable until this problem is resolved. 1. Attach lightwave transceiver to 25-pair backplane connector **in slot belonging to Expansion Interface circuit pack**. 2. Reset the circuit pack again. 3. If the reset fails with an error code other than 5002, refer to the appropriate Maintenance documentation. 4. If the reset fails again with Error Code 5002, replace the lightwave transceiver, reset the circuit pack, and execute the **reset board PCSS** command again. 5. If the reset fails again with Error Code 5002, the new lightwave transceiver may be defective, or the Expansion Interface circuit pack may need to be replaced.

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Table 11-160. TEST #336 Expansion Interface Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5016 5017 5018 5019 5032 5033 5048 5064 5080 5096 5112	FAIL	**Initialization failure:** Expansion Interface circuit pack reset successfully and restarted execution. But the Expansion Interface circuit pack detected communication errors during the self-test phase of the hardware initialization. The nature of the failure may prevent the Expansion Interface circuit pack from communicating with its neighbor Expansion Interface circuit pack on the opposite end of the fiber. The fault itself may be either on the Expansion Interface circuit pack or on the lightwave transceiver. 1. If all other tests on this Expansion Interface circuit pack are passing and no other errors have been logged against this circuit pack, replacement of the lightwave transceiver or the circuit pack are recommended, but not critical. 2. If all other tests on this Expansion Interface circuit pack are not passing or other errors have been logged against this circuit pack, the lightwave transceiver and/or the Expansion Interface circuit pack should be replaced.
	PASS	The Expansion Interface was successfully reset, and it did restart execution. Also, it passed all its initialization tests and detected a lightwave transceiver. Remove the Expansion Interface circuit pack from the busyout state by using the **release board PCSS** command. 1. Execute **test board PCSS short** command. Refer to errors for each test.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Packet Interface Test (#589)

This test attempts to send a data packet from the TN778 Packet Control circuit pack through any intervening Expansion Interface circuit packs and through the Expansion Interface circuit pack to be tested. The path the data packet takes is dependent on the location of the Expansion Interface circuit pack to be tested and whether the Expansion Interface circuit pack is par of the Active link or Standby link.

If the Expansion Interface circuit pack to be tested is part of an Active link from PPN to either EPN, the path shown in Figure 11-36 is used.

If the Expansion Interface circuit pack to be tested is on either EPN and is part of a Standby link from PPN to either EPN, the path shown in Figure 11-37 is used. The path in this figure is also used if the Expansion Interface circuit pack to be tested is on the PPN.

If the Expansion Interface circuit pack to be tested is part of a link from EPN to EPN, the path shown in Figure 11-38 is used.

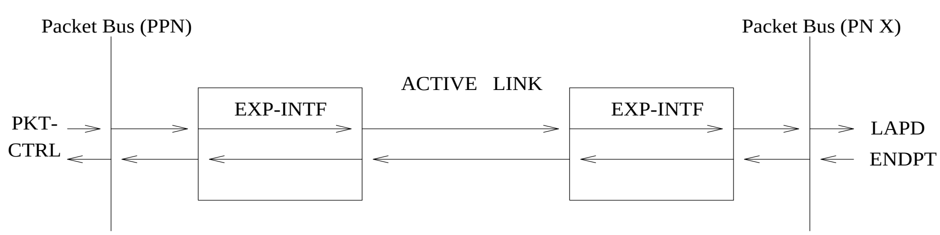

Figure 11-36. (Active EXP-INTFs on EPNs Only)

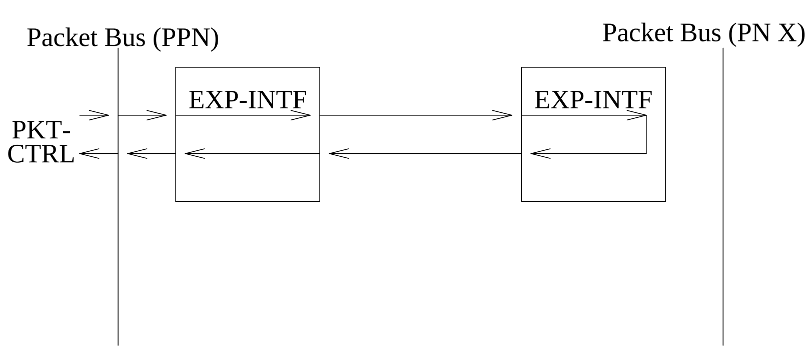

Figure 11-37. (Standby EXP-INTFs on EPNs or PPN EXP-INTFs Only)

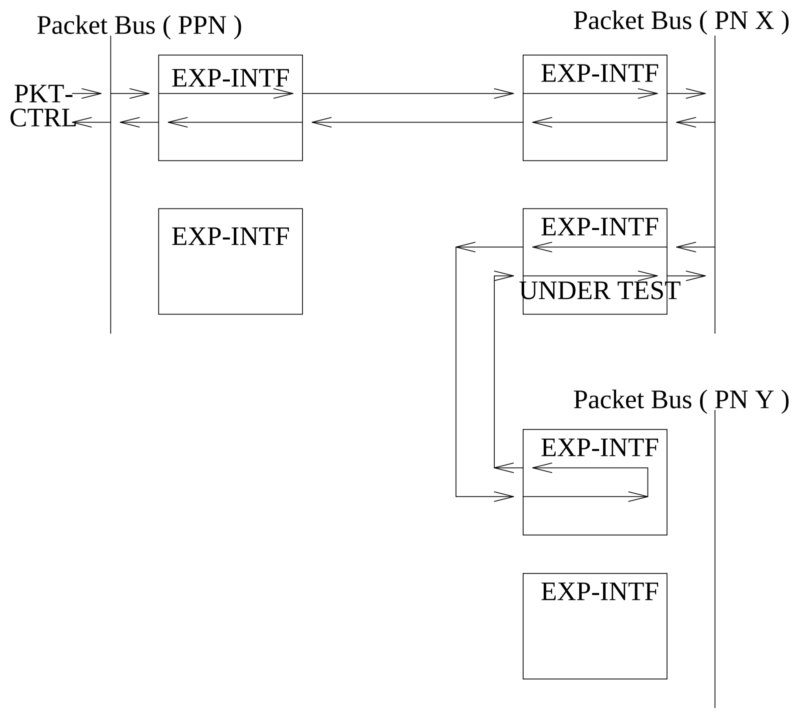

Figure 11-38. Expansion Interface Packet Interface Test—EPN to EPN

Table 11-161. TEST #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description/ Recommendation
1005	ABORT	This test does not apply to the current system configuration. Either the system is not administered to have the Packet Bus activated, the Maintenance-Related System Parameters form has the Packet Bus Enabled field set to "n," or the system is administered to have the Packet Bus activated, but there exist TN776 Expansion Interface circuit packs that prevent this test from running. The TN776 Expansion Interface circuit packs do not support Packet Bus capabilities.

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Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1033	ABORT	The test cannot run because either one or both of the Expansion Interface circuit packs on this link are busied out or an Exapnsion Interface circuit pack is not present on the opposite end of the fiber. 1. If Expansion Interface is busied out, issue the **release board PCSS** command. 2. Examine the results of Tests #237 and #238.
1139	ABORT	The Packet Bus in an EPN (Port Network 2 or 3) has a major alarm against it. This test needs to use the alarmed port network's packet bus. 1. Resolve the Packet Bus alarm. 2. Retry the command.
1140	ABORT	Not enough packet ports are available to complete this test. 1. If the port network being tested does not contain any packet circuit packs, ignore the results of this test. 2. If the port network being tested does contain packet circuit packs, determine if any or all of them are faulty by examining the alarm and error logs. 3. If any faulty circuit packs are found, refer to the appropriate Maintenance documentation for the recommended repair procedures and try to resolve any problems. Then, retry the command. 4. If no faulty boards are found, all of the ports are busy. Use the **busyout board PCSS** command to buyout a packet circuit pack or wait for one to become idle and retry the command.

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Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The Packet Control circuit pack is out-of-service. 1. Determine if the Packet Control circuit pack is busied out. (This is indicated by an Error Type 18 logged against PKT-CTRL.) If it is, release it via the **release packet-control** command, and retry the command. 2. If the Packet Control circuit pack is NOT busied out, refer to PKT-CTRL Maintenance documentation for the repair procedure for the Packet Control circuit pack.
1144	ABORT	The Packet Bus in the PPN has a major alarm active against it. 1. Resolve the alarm in the PPN. 2. Retry the command.
1195	ABORT	An EI link switched during this test. 1. Retry the command at one minute intervals a maximum of three times. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1421	ABORT	This abort code is valid and can appear only when the Expansion Interface circuit pack addressed in the test command is one which terminates the link between two the EPNs. It indicates that the test failed, but that this test was run on the EPN EI circuit pack that: a. is in the same EPN as the circuit pack under test, b. is on the active link and c. terminates the fiber from the PPN. The EI tested is probably not at fault. 1. Enter **display alarms** and follow the EXP-INTF repair procedures for the EPN EI that: a. is in the same EPN as the circuit pack just tested here b. is on the active link, and c. terminates the fiber from the PPN. 2. If there are no alarms logged against that EI, run Test #589 on it and follow procedures for this test. 3. Try this command again.
2060	ABORT	The link on the Packet Bus that is being used to perform the test has failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, check for problems with the Packet Control circuit pack (look for PKT-CTL errors). 3. If there is no problem with the Packet Control circuit pack, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of three times. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The transmitted data packet was not received correctly by the Packet Control circuit pack. If there are any PKT-BUS errors in the Error Log, attempt to resolve those errors before investigating these test failures. PROCEDURE A Use Procedure A if the Expansion Interface circuit pack to be tested is in an EPN and is part of an Active link from the PPN to the EPN. 1. Test the Packet Control circuit pack via the **test packet-control** command. If the Packet Control circuit pack fails any tests, refer to the PKT-CTRL Maintenance documentation for recommended maintenance procedures. 2. If all Packet Control circuit pack tests pass, the failure may be in either the PPN Expansion Interface circuit pack or the connected Expansion Interface circuit pack under test or on the EPN Packet Bus. If a duplicate Expansion link exists, make that the Active link, using the **set expansion-link PCSS** command. Execute the **test board long** command on the original Expansion Interface circuit pack and the connected PPN Expansion Interface circuit pack and follow the procedures for Test #242. 3. If a duplicate link does not exist, run the Long Test Sequence on the PPN Expansion Interface circuit pack. If Test #242 fails, follow the procedures for Test #242. If Test #242 passes, the fault is in the EPN Expansion Interface circuit pack under test or on the EPN Packet Bus. *More information follows.*

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Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	PROCEDURE B Use Procedure B if the Expansion Interface circuit pack to be tested is in an EPN and is part of a Standby link from the PPN to the EPN or if the Expansion Interface circuit pack to be tested is in the PPN. 1. Test the Packet Control circuit pack. If the Packet Control circuit pack fails any tests, refer to the PKT-CTRL Maintenance documentation for recommended maintenance procedures. 2. If all Packet Control circuit pack tests pass, the failure may be in either the PPN Expansion Interface circuit pack or the connected EPN Expansion Interface circuit pack. If the circuit pack being tested is in the PPN and is part of an Active link from the PPN to the EPN and if a duplicate Expansion link exists, make that the Active link, using the **set expansion-link PCSS** command. Execute the **test board long** command on the original PPN Expansion Interface circuit pack and the connected EPN Expansion Interface circuit pack and follow the procedures for Test #242. Otherwise, if a duplicate link does not exist, run the Long Test Sequence on the PPN Expansion Interface circuit pack. If Test #242 fails, follow the procedures for Test #242. If Test #242 passes, the fault is in the connected EPN Expansion Interface circuit pack. 3. If the test was not run on an active PPN Expansion Interface circuit pack, issue the **test board PCSS long** command on both Standby Expansion Interface circuit packs and follow the procedures for Test #242. *More information follows.*

Continued on next page

Table 11-161. TEST #589 Expansion Interface Packet Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	PROCEDURE C Use Procedure C if the Expansion Interface circuit pack to be tested is part of any link from EPN to EPN. 1. Test the Packet Control circuit pack. If the Packet Control circuit pack fails any tests, refer to the PKT-CTRL Maintenance documentation for recommended maintenance procedures. 2. If all Packet Control circuit pack tests pass, the failure may be in the Expansion Interface circuit packs of the EPN to EPN link or on the EPN Packet Bus. 3. Issue the **test board PCSS long** command on both EPN to EPN Expansion Interface circuit packs and follow the procedures for Test #242.
	PASS	The data packet was received correctly. 1. Refer to other Expansion Interface circuit pack tests if the Expansion link is not functioning correctly.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board UUCSS** command. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest. 4. Escalate if failure persists.

Expansion Interface Link Switch Command

This action is potentially destructive.

The Expansion Interface switch command enables system technician to choose which set of Expansion Interface Links should be the Active link when duplicate Expansion Interface Links are available.

The command line entry is **set expansion-link PCSS**, where PCSS is the Expansion Interface address of *either* Expansion Interface circuit pack on the Standby link. If the **status system** command indicates that the Standby link is up, the **set expansion-link** command makes the Standby link the Active link.

This action is destructive because it must temporarily disable all connections between PPN and EPN. This break in the connections is not detectable by normal voice users.

CAUTION:

Data connections lose a small amount of data. Depending on the data transmission speed, the lost data is anywhere from zero to several bytes.

It is recommended that system technician switch links when it is necessary to run the more destructive tests on Expansion Interface circuit packs. Most significantly, Test #242 requires the Expansion Interface circuit pack to be busied out and, therefore, the link with the Expansion Interface to be tested should be made the Standby link.

To prevent the system from automatically switching Expansion Interface Links during system technician-demanded tests, busyout one or both of the Standby Expansion Interface circuit packs.

CAUTION:

This introduces a small risk. If the remaining Active Expansion Link should fail while the Standby Expansion Link is busied out, service to the EPN is lost.

The **set expansion-link** command has no error codes to return. It displays one of following messages upon completion:

1. **Command completed successfully**

   Link switch was successful. This may be verified by visually inspecting the new yellow LED states as described in Table 11-152 on page 11-779 or by the **status system** command.

2. **Command did not complete successfully**

   This indicates that the system attempted to switch links, but for unknown reasons the software or hardware was unable to complete the action. The system may have switched and determined that the new link could not provide service and thus returned to the original link.

3. **Standby EXP-INTF Link is unable to take over**

   Because the Expansion Interface circuit pack pair on the Standby link has enough errors logged against it as to be unable to provide service, the system did not attempt to switch links.

4. **EXP-INTF is already on active link**

   The Expansion Interface circuit pack address given in the **set expansion-link** command is an Active Expansion Interface. The address must be a Standby Expansion Interface circuit pack in order to switch links.

5. **Address is not a valid Expansion Interface Board**

   The link switch could not be attempted because the address in the **set expansion-link** command did not correspond to any known Expansion Interface circuit pack.

EXP-LINK (Expansion Interface Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
EXP-LINK	MAJOR	display errors[1]	Expansion Interface Link

1 Display errors for "infc" category and investigate EXP-INTF errors.

The EXP-LINK (Expansion Interface Link) Maintenance strategy is covered in the EXP-INTF (Expansion Interface Circuit Pack) Maintenance documentation.

Hardware Error Log Entries and Test to Clear Values

Expansion Interface Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	disp err
122 (a)		None	MAJOR	ON	
122 (b)	None, 1-10	None	MAJOR	ON	
122 (c)	30-40	None	MAJOR	ON	
122 (d)	6	None	MAJOR	ON	
122 (e)	8	None	MAJOR	ON	

a. This alarm is used only to indicate that all Expansion Interface Links between a pair of Port Networks (PNs) are down. This condition is indicated by the EXP-LINK Error Type 122 in the Error Log. When this condition occurs, examine all EXP-INTF errors to resolve the alarm.

   The pair of PNs is specified in the port fields as follows: 1-2 (PPN to EPN1), 1-3 (PPN to EPN2), and 2-3 (EPN1 to EPN2).

b. Aux Data values of blank and 1 through 10 mean that the link is down due to a defective Expansion Interface Link. Look for and resolve Expansion Interface circuit pack errors.

c. Aux Data values of 30 through 40 mean that the EPN was reset because of a temporary loss of system timing reference on the EPN. Execute the **display errors** command with the category "tone" to determine what caused the loss or restoration of the clock.

d. The system detected an excessive backup of traffic on the Active Expansion Link. This condition may have been due to communication difficulties on the Expansion Link. To restore normal service, the system had to reset the Expansion port network served by the Expansion Link. Error type 10004 should have been logged against the Expansion Interface circuit pack that reported the traffic congestion.

e. Aux Data value of 8 means that the link is down due to the recovery feature of the EPN Sanity Audit. Look for EPN-SNTY errors in the error log, and refer to the EPN-SNTY section for more details.

EXT-DEV ADMIN? N (External Device Alarm)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
EXT-DEV	MAJOR	test environment UU	External Device Alarm
EXT-DEV	MINOR	test environment UU	External Device Alarm

1 where UU is an appropriate cabinet number determined via the PORT field from the Alarm or Error Log.

NOTE:
Use this Maintenance Object when the *External Device Alarm Admin?* field on the *change system-parameters customer-options* form is set to (**n**).

In the Standard Reliability PPN the Maintenance Processor (TN786B or TN790) in carrier (A) monitors the EXT-DEV alarm leads. In the High or Critical PPN, the Duplication Interface (TN772) circuit pack in carrier (A) monitors the EXT-DEV alarm leads, and provides status to the Maintenance processor (TN786B or TN790) in the active SPE. In the EPN the Maintenance Board (TN775) monitors the EXT-DEV alarm leads. The system only recognizes pairs connected to the 1M and 1m (ALARM MONITOR) leads. Pairs connected to the 2M, 2m, 3M, 3m, and 3w are not recognized by the system. Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111, for more details.

Hardware Error Log Entries and Test to Clear Values

Table 11-162. Hardware Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment UU r2 or 6
1 or 5	Any	External Device Alarm Test (#120)	MAJOR MINOR[2]	OFF	test environment UU r 2 or 6

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 One port generates a MAJOR alarm; the other port generates a MINOR alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test,* you may also clear errors generated from other tests in the testing sequence.

Multicarrier Cabinet Tests			
Order of Investigation	**Short Test Sequence**	**Long Test Sequence**	**D/ND[1]**
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
OLS Query Test (Carrier E) (#127) (c)	X	X	ND
OLS Query Test (Carrier D) (#127) (c)	X	X	ND
OLS Query Test (Carrier A) (#127) (c)	X	X	ND
OLS Query Test (Carrier B) (#127) (c)	X	X	ND
OLS Query Test (Carrier C) (#127) (c)	X	X	ND
Emergency Transfer Query Test (#124) (d)	X	X	ND
Cabinet Sensors Query Test (#122) (e)	X	X	ND
External Device Alarm Test (MAJOR port) (#120)	X	X	ND

Continued on next page

Multicarrier Cabinet Tests — *Continued*

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
External Device Alarm Test (MINOR port) (#120)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to POWER (Battery & Battery Charger) section for a description of this test.

b. Refer to AC-POWER (AC Power) section for a description of this test.

c. Refer to CARR-POW (Carrier Port Power Supply) section for a description of this test.

d. Refer to EMG-XFER (Emergency Transfer) section for a description of this test.

e. Refer to CABINET (Cabinet Sensors) section for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) section for a description of this test.

Single Carrier Cabinet Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SCC Power Query Test (#79) (a)	X	X	ND
Emergency Transfer Query Test (#124) (b)	X	X	ND
External Device Alarm Test (MAJOR port) (#120)	X	X	ND
External Device Alarm Test (MINOR port) (#120)	X	X	ND
Analog Ring Generator Initialization Test (#117) (c)	X	X	ND
Analog Ring Generator Query Test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to DC-POWER (Single Carrier Cabinet Power) section for a description of this test.

b. Refer to EMG-XFER (Emergency Transfer) section for a description of this test.

c. Refer to RING-GEN (Analog Ring Generator) section for a description of this test.

External Device Alarm Test (#120)

The External Device Alarm Test requests the state of the External Device Alarm from the Maintenance circuit pack and reports the results. The test has no effect on the external device itself.

Table 11-163. TEST #120 External Device Alarm Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 5 time. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals a maximum of 5 time. 2. If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet or DC-POWER alarms in a single carrier cabinet. Then, repeat the test. 3. If the test continues to ABORT with a 2000 error code, check for and resolve all SYSAM errors in a PPN or MAINT (EPN Maintenance circuit pack) errors in an EPN. Then, repeat the test. 4. If the test continues to ABORT with a 2000 error code, then escalate the problem.
2029 2319 2320 2500	ABORT	Internal System Error 1. Retry the command at 1 minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-163. TEST #120 External Device Alarm Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	The External Device Alarm has been activated by the external device. 1. Clear the major alarm on the external device, and rerun the test. 2. If the test still fails, then disconnect the External Device Alarms from the Maintenance circuit pack and rerun the test. 3. If the test still fails, then there is a problem with the Maintenance circuit pack that is reporting the alarm. This circuit pack should be replaced. There are failures that can occur on Maintenance circuit pack's that *will not* be detected by their respective maintenance, but which will cause many environment tests to fail. If many environment tests are failing, the suspect circuit pack should be replaced and the test rerun. 4. If the test still fails, escalate the problem.
	PASS	If there is a problem with the external device, but the Maintenance circuit pack connected to the device reports no alarm, then the External Device may not be properly reporting the problems or the External Device may not be properly connected to the External Device.

EXT-DEV ADMIN? Y (External Device Alarm)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
EXT-DEV	MAJOR	test eda-external-device-alrm physical location	External Device Alarm
EXT-DEV	MINOR	test eda-external-device-alrm physical location	External Device Alarm
EXT-DEV	WARNING	test eda-external-device-alrm physical location	External Device Alarm

1 where UU is an appropriate cabinet number determined via the PORT field from the Alarm or Error Log.

NOTE:
Use this Maintenance Object when the *External Device Alarm Admin?* field on the *change system-parameters customer-options* form is set to (**y**). You must have INADS or INIT login permission to administer EXT-DEV Alarm.

Generic 3i Maintenance circuit packs each have alarm leads which can be connected to external devices such as Uninterruptible Power Supplies (UPS) or adjuncts such as AUDIX. Certain conditions on the external device close the contacts on the alarm leads to notify the switch which in turn originates an EXT-DEV alarm.

The special locations UUmajor and UUminor are used to designate the major or minor maintenance board alarm connection for cabinet UU. The major/minor designation specifies the port, not the alarm level associated with the connection; *for example,* the “major” port can be administered as a major, minor, or warning alarm, and the “minor” port can be administered as a major, minor or warning alarm. In addition Analog line ports can also be administered as external device alarms.

NOTE:
An unadministered maintenance board external device alarm port, that is sensing a contact closure will have an entry in the Error Log and in the Alarm Log. INADS will not receive warning alarms.

In the Standard Reliability PPN the Maintenance Processor (TN786B or TN790) in carrier (A) monitors the EXT-DEV alarm leads. In the High or Critical PPN, the

Duplication Interface (TN772) circuit pack in carrier (A) monitors the EXT-DEV alarm leads, and provides the status to the Maintenance processor (TN786B or TN790) in the active SPE. In the EPN the Maintenance Board (TN775) monitors the EXT-DEV alarm leads. The system only recognizes pairs connected to the 1M and 1m (ALARM MONITOR) leads. Pairs connected to the 2M, 2m, 3M, 3m, and 3w are not recognized by the system. Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111, for more details.

Hardware Error Log Entries and Test to Clear Values

Table 11-164. Hardware Error Log Entries and Test to Clear Value

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	test eda-external-device-alrm physical location r 2 or 6
1 or 5	Any	External Device Alarm Test (#120)	Any	OFF	test eda-external-device-alrm physical location r 2 or 6

NOTE:
The loss of -48 volt power will prevent detection of an external device alarm. AC-POWER, CARR-POW, and DC-POWER alarms could indicate the loss of the external device alarm -48 volt power source. ALARM-PT alarms may also indicate a loss of power. When analog line ports are administered as analog line external device alarms loss of -48 volts will prevent detection of an external device alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test,* you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
External Device Alarm Test (MAJOR port) (#120)	X	X	ND
External Device Alarm Test (MINOR port) (#120)	X	X	ND
External Device Alarm Test (WARNING port) (#120)	X	X	ND

1 D = Destructive; ND = Nondestructive

External Device Alarm Test (#120)

The External Device Alarm Test requests the state of the External Device Alarm from a Maintenance circuit pack and reports the results. The test has no effect on the external device itself.

Table 11-165. TEST #120 External Device Alarm Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 5 time. 2. If the test continues to abort, escalate the problem.
1035	ABORT	The Expansion Port Network containing this equipment is not available Look for and resolve all Expansion Port Network problems with this cabinet.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals a maximum of 5 time. 2. (Maintenance Board) If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier. Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet or DC-POWER alarms in a single carrier cabinet. Then, repeat the test. 3. (Maintenance Board) If the test continues to ABORT with a 2000 error code, check for and resolve all maintenance circuit pack errors. Then, repeat the test. 4. If the test continues to ABORT with a 2000 error code, then escalate the problem.
2029 2100 2319 2320 2500	ABORT	Internal System Error 1. Retry the command at 1 minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-165. TEST #120 External Device Alarm Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	The External Device Alarm has been activated by the external device. 1. Clear the major alarm on the external device, and rerun the test. 2. If the test still fails, then disconnect the External Device Alarm Leads from the Maintenance circuit pack and rerun the test. 3. If the test still fails, then there is a problem with the analog external device alarm port or the Maintenance circuit pack that is reporting the alarm. This circuit pack should be replaced. There are failures that can occur on the Maintenance circuit pack that *will not* be detected by their respective maintenance, but which will cause many environment tests to fail. If many environment tests are failing, the suspect circuit pack should be replaced and the test rerun. 4. If the test still fails, escalate the problem.
	PASS	If there is a problem with the external device, but the administered analog line external device alarm, or the administered Maintenance circuit pack connected to the device reports no alarm, then the External Device may not be properly reporting the problems or the External Device may not be properly connected to the External Device Alarm Lead.

FL-DATA (Flash Data Consistency)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
FL-DATA	MAJOR	test card-mem a|b l	Flash Data Consistency
FL-DATA	MINOR	test card-mem a|b l	Flash Data Consistency
FL-DATA	WARNING	test card-mem a|b l	Flash Data Consistency

In systems with High or Critical Reliability, the system software and the hard patch update files are stored in the on-board flash memory in both the Active SPE and Standby SPE. The translations and announcements are stored in the memory cards in both the Active SPE and Standby SPE. Flash Data Consistency flags problems when files become mismatched by monitoring the translations, announcements, update files, and software vintage number in a High or Critical Reliability PPN system. If the software vintage numbers on both SPEs are mismatched, a MAJOR alarm is raised. If the announcement files on both memory cards are mismatched, a WARNING alarm is raised. For all other problems, a MINOR alarm is raised. The software vintage can be displayed via the **list configuration software-vintage long** command. The Flash Data Consistency Test is run on system technician command and as part of daily Standby SPE maintenance.

NOTE:
Flash Data Consistency is not applicable to Standard systems.

Hardware Error Log Entries and Test to Clear Values

Table 11-166. Flash Data Consistency Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test card-mem a/b l
8 or 16	8 or 16	Flash Data Consistency Test (#421)	WARNING	OFF	test card-mem a/b
1-3,					
9-10,					
17-18,					
32-34,					
40-42,					
48-50,					
64-66,	8 or 16	Flash Data Consistency Test (#421)	MINOR	OFF	test card-mem a/b l
72-74,					
80-82,					
9-15,					
17-86,					
160, 192,					
288, 320,					
416, 448					
4-6,					
12-14,					
20-22,					
36-38,					
44-46,					
52-54,					

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Table 11-166. Flash Data Consistency Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
68-70 76-78, 84-86, 132, 164, 196, 260, 292, 324, 388, 420, 452	8 or 16	Flash Data Consistency Test (#421)	MAJOR	OFF	upgrade software

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. The Aux Data field records which SPE was active at the time the Flash Data Consistency Test failed. An "8" in the log refers to carrier A and a "16" refers to carrier B.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Memory Card Insertion Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
12 Volt Power Supply Test (#701) (b)	X	X	ND
Memory Card Insertion Test (#695) (a)	X	X	ND
Memory Card Format and Read Test (#696) (a)	X	X	ND
Memory Card Match Test (#697) (a)	X	X	ND
Memory Card Write-Protected Test (#698) (a)	X	X	ND
Memory Card Directory Recovery Test (#699) (a)	X	X	ND
Memory Card Translation Data Integrity Test (#694) (a)		X	ND
Memory Card Erase/Write/Read Test (#693) (a)		X	ND
Flash Data Consistency Test (#421) (c)		X	ND

1 D = Destructive; ND = Nondestructive

a. See CARD-MEM (Memory Card) Maintenance documentation for this test description.

b. See 12V-PWR (12 Volt Power Supply) Maintenance documentation for a description of this test.

c. The Flash Data Consistency Test does not run in a Standard system.

Flash Data Consistency Check Test (#421)

The software vintage number, translation time stamps, announcement time stamps, and update file time stamps and identifiers are read off of both memory cards or SPEs and then compared. If the comparison shows any discrepancy, FL-DATA is alarmed. This test is only run in a High or Critical Reliability system. The test is run as part of the **test card-mem long** and as part of the standby PE scheduled maintenance.

Table 11-167. TEST #421 Flash Data Consistency Check Test

Error Code	Test Result	Description/ Recommendation
0	ABORT	The test timed out without completing. This error can occur when the system is heavily loaded and the test is not allocated sufficient time to run. 1. Rerun the test when the system is less busy and is not running standby maintenance. 2. If the test continues to abort, escalate the problem.
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9005	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
35498	ABORT	Difficulty was encountered trying to send information between the SPEs.
35512	ABORT	The Standby SPE cannot be put into maintenance mode. 1. Check for and resolve all DUPINT (Duplication Interface Circuit Pack), SHDW-LNK (Memory Shadowing Link), SHDW-CIR (Common Shadow Circuit), and STBY-SPE (Standby SPE) alarms. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
35514	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
35534	ABORT	Could not allocate the (active or standby) memory card drive because another memory card operation was in progress. 1. Wait 10 minutes, and retry the command.
35535	ABORT	Could not access the (active or standby) memory card. 1. The memory card may be damaged or missing. Resolve all problems with all memory card tests in the Long Test Sequence for both memory cards. 2. Repeat the test.
1	FAIL	The standby translations are out-of-date. The translations on the Standby SPE (memory card) are older than those on the Active SPE (memory card).
2	FAIL	The Active SPE translations are out-of-date. 1. Issue **save translations** command. If the translation save passes on both SPEs, go to Step 2. 2. Run **test card-mem long** again to resolve the alarms.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4	FAIL	The load vintages are different in both SPEs. 1. Determine the desired software release by issuing the **list configuration software long** command. Obtain the memory card of the same software release. Follow the **upgrade software** procedure to upgrade the out-of-date SPE. 2. Run the **test card-mem long** command again to resolve the alarms.
5	FAIL	The load vintages and translations are different in both SPEs. The Active SPE has the most current translations. 1. Follow the procedures for Error Code 4.
6	FAIL	The load vintages and translations are different in both SPEs. The Standby SPE has the most current translations. 1. Follow the procedures for Error Code 4. 2. Issue the **save translations** command. If the translation save passes on both SPEs, proceed to Step 3. 3. Run the **test card-mem long** command again to resolve the alarms.
8	FAIL	The announcements are different in both SPEs. The Active SPE has the most current announcements. 1. Issue the **save announcements** command to save announcements in both SPEs. If the announcement save passes on both SPEs, go to Step 2. 2. Run the **test card-mem long** again to resolve the alarms.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
9	FAIL	The translations and announcements are different in both SPEs. The Active SPE is the most current.
10	FAIL	The translations and announcements are different in both SPEs. The Standby SPE has the most current translations, and the Active SPE has the most current announcements. 1. Issue the **save translations** command to save translations in both SPEs. 2. Issue the **save announcements** command to save announcements in both SPEs. 3. If both the translation save and announcement save pass on both SPEs, run the **test card-mem long** command again to resolve the alarms.
12	FAIL	Load vintages and announcements are different in both SPEs. The Active SPE has the most current announcements. 1. Follow the procedures for Error Codes 4 and 8.
13	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Active SPE has the most current translations and announcements. 1. Follow the procedures for Error Codes 4 and 10.
14	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Standby SPE has the most current translations, and the Active SPE has the most current announcements. 1. Follow the procedures for Error Code 4. Be sure to issue the **save announcements** command.
16	FAIL	Announcements are different in both SPEs. The Standby SPE has the most current announcements. 1. Follow the procedures for Error Code 8.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
17	FAIL	The translations and announcements are different in both SPEs. The Active SPE has the most current translations and the Standby SPE has the most current announcements.
18	FAIL	The translations and announcements are different in both SPEs. The standby SPE is the most current. 1. Follow the procedures for Error Code 9.
20	FAIL	The load vintages and announcements are different in both SPEs. The Standby SPE has the most current announcements.
21	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Active SPE has the most current translations and the Standby SPE has the most current announcements.
22	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code 4. Be sure to issue the **save announcements** command.
32	FAIL	The update files are different in both SPEs. The update file on the Active SPE is most current. 1. Have INADS issue the **copy update-file** command. If the update file copy passes, go to Step 2. 2. Reissue the **test card-mem long** command to resolve the alarms.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
33	FAIL	The update files and translations are different in both SPEs. The Active SPE has the most current update file and translations.
34	FAIL	The update files and translations are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current translations. 1. Issue the **save translations** command to save translations on both SPEs. 2. Have INADS issue the **copy update-file** command to copy the update file from the Active to the Standby SPE. 3. Reissue the **test card-mem long** command to resolve the alarms.
36	FAIL	The update files and load vintages are different in both SPEs. The Active SPE has the most current update file.
37	FAIL	The update files, load vintages, and translations are different in both SPEs. The Active SPE has the most current update file and translations.
38	FAIL	The update files, load vintages, and translations are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
40	FAIL	The update files and announcements are different in both SPEs. The Active SPE has the most current update file and announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Have INADS issue the **copy update-file** command to copy the update file from the Active to the Standby SPE. 3. Run the **test card-mem long** again to resolve the alarms.
41	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, translations, and announcements.
42	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements, and the Standby SPE has the most current translations. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Have INADS issue the **copy update-file** command to copy the update file from the Active to the Standby SPE. 4. Reissue the **test card-mem long** command to resolve the alarms.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
44	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements.
45	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, translations, and announcements.
46	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements, and the Standby SPE has the most current translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. Be sure to save the announcements. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.
48	FAIL	The update files and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current announcements. 1. Follow the procedures for Error Code 40.
49	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and translations, and the Standby SPE has the most current announcements.
50	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code 41.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
52	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current announcements.
53	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, and translations, and the Standby SPE has the most current announcements.
54	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and the Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.
64	FAIL	The update files are different in both SPEs. The update file on the Standby SPE is the most current. 1. If you are on site with the switch, replace the Active SPE memory card with the Standby SPE memory card. If you are not on site with the switch, issue the **reset system interchange** command. This action causes the Standby SPE to become the Active SPE. Refer to the "Reset Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for information on the side effects of a processor interchange. 2. Have INADS issue the **copy update-file** command. If the update file copy passes, go to Step 3. 3. Reissue the **test card-mem long** command to resolve the alarms.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
65	FAIL	The update files and translations are different in both SPEs. The Standby SPE has the most current update file, and the Active SPE has the most current translations.
66	FAIL	The update files and translations are different in both SPEs. The Standby SPE has the most current update file and translations. 1. Issue the **save translations** command to save translations on both SPEs. 2. Follow the procedures for Error Code 64.
68	FAIL	The update files and load vintages are different in both SPEs. The Standby SPE has the most current update file.
69	FAIL	The update files, load vintages, and translations are different in both SPEs. The Standby SPE has the most current update file, and the Active SPE has the most current translations.
70	FAIL	The update files, load vintages, and translations are different in both SPEs. The Standby SPE has the most current update file and translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.
72	FAIL	The update files and announcements are different in both SPEs. The Standby SPE has the most current update file and the Active SPE has the most current announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Follow the procedures for Error Code 64.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
73	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current translations and announcements, and the Standby SPE has the most current update file.
74	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file and translations. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Follow the procedures for Error Code 64.
76	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file.
77	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current translations and announcements, and the Standby SPE has the most current update file.
78	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file and translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.
80	FAIL	The update files and announcements are different in both SPEs. The Standby SPE has the most current update file and announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Follow the procedures for Error Code 64.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
81	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current translations, and the Standby SPE has the most current update file and announcements.
82	FAIL	The update files, translations, and announcements are different in both SPEs. The Standby SPE has the most current update file, translations, and announcements. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Follow the procedures for Error Code 64.
84	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Standby SPE has the most current update file and announcements.
85	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current translations, and the Standby SPE has the most current update file and announcements.
86	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Standby SPE has the most current update file, translations, and announcements. 1. Follow the procedures for Error Code 4 to correct the load vintage. After running the **test card-mem long** command, check for Error Codes 32 or 64. Follow the recovery procedure under the applicable error code.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
128	ABORT	The Translation memory card in the Active SPE is missing.
132	FAIL	The load vintages are different in both SPEs and the translation memory card is missing in the Active SPE. 1. Follow the procedures for Error Code 4 to correct the software vintage. 2. Insert the translation memory card in the Active SPE. 3. Run the **test card-mem long** command again to resolve the alarms.
160	FAIL	The update file in the Active SPE is more current than the Standby SPE and the translation memory card is missing in the Active SPE. 1. Have INADS issue the **copy update-file** command. If the update file copy passes, proceed to Step 2. 2. Insert the translation memory card in the Active SPE. 3. Reissue the **test card-mem long** command to resolve the alarms.
164	FAIL	The load vintages and the update files are different in both SPEs, and the translation memory card in the Active SPE is missing. The update file in the Active SPE is more current. 1. Both load vintages and update files should not be mismatched. Escalate the problem.
192	FAIL	The update file in the Standby SPE is more current and the translation memory card is missing in the Active SPE. 1. Follow the procedures for Error Code 160.
196	FAIL	The load vintages and the update files are different in both SPEs, and the translation memory card in the Active SPE is missing. The update file in the Standby SPE is more current. 1. Follow the procedures for Error Code 164.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
256	ABORT	Translation memory card is missing in the Standby SPE.
260	FAIL	The load vintages are different in both SPEs and the translation memory card is missing in the Standby SPE. 1. Follow the procedures for Error Code 132.
288	FAIL	The update file in the Active SPE is more current and the translation memory card is missing in the Standby SPE. 1. Follow the procedures for Error Code 160.
292	FAIL	The load vintages and the update files are different in both SPEs, and the translation memory card is missing in the Standby SPE. The update file in the Active SPE is more current. 1. Follow the procedures for Error Code 164.
320	FAIL	The update file in the Standby SPE is more current and the translation memory card is missing in the Standby SPE. 1. Follow the procedures for Error Code 160.
324	FAIL	The load vintages and the update files are different in both SPEs and the translation memory card in the Standby SPE is missing. 1. Follow the procedures for Error Code 164.

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Table 11-167. TEST #421 Flash Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
384	ABORT	The translation memory cards are missing in both SPEs.
388	FAIL	The load vintages are different in both SPEs and the translation memory cards are missing in both SPEs. 1. Follow the procedures for Error Code 132.
416	FAIL	The update file in the Active SPE is more current, and the translation memory cards are missing in both SPEs. 1. Follow the procedures for Error Code 160.
420	FAIL	The load vintages and the update files are different in both SPEs, and the translation memory cards are missing in both SPEs. The update file in the Active SPE is more current. 1. Follow the procedures for Error Code 164.
448	FAIL	The update file in the Standby SPE is more current, and the translation memory cards are missing in both SPEs. 1. Follow the procedures for Error Code 160.
452	FAIL	The load vintages and the update files are different in both SPEs, and the translation memory cards are missing in both SPEs. The update file in the Standby SPE is more current. 1. Follow the procedures for Error Code 164.
	PASS	The load vintages, translations, announcements, and update files are the same.

GPTD-PT [General Purpose Tone Detector Port (CPTR)]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
GPTD-PT[1]	MAJOR	test port PCSSpp sh	General Purpose Tone Detector Port (CPTR)
GPTD-PT	MINOR	test port PCSSpp sh	General Purpose Tone Detector Port (CPTR)
GPTD-PT	WARNING	release port PCSSpp	General Purpose Tone Detector Port (CPTR)

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The General Purpose Tone Detector (GPTD) Port, also known as Call Progress Tone Receiver (CPTR), resides on the Tone Detector circuit pack (TN748 [all suffixes], TN420B [and greater suffixes], and TN756 combined tone detector and tone clock [all suffixes]). There are two GPTD ports and four Dual Tone Multifrequency Receiver (DTMR) ports on a Tone Detector circuit pack. The GPTD port is used to perform level measurements of test tones and to detect call progress tones. Examples of call progress tones are dial tone, ring back, busy, alert, confirmation, and recall dial. The abilities of the GPTD port to perform level measurements of test tones and to detect call progress tones are essential for maintenance of other circuit packs (for example, Tone-Clock).

The GPTD maintenance feature defines a set of tests to ensure that the general purpose tone detection capability of the GPTD port is functioning properly. For all Tone Detector circuit pack level errors (DETR-BD), refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation.

Hardware Error Log Entries and Test to Clear Values

General Purpose Tone Detector Port (CPTR) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (b)	17664	Tone Detector Audit/ Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 2
18	0	busyout port PCSSpp	WARNING	ON	release port PCSSpp
130 (d)		None	WARNING	ON	test port *UUCSSpp* sh r 2
257 (c)	17666	Tone Detector Audit/ Update Test (#43)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3
513	Any	Tone Detection Verification Test (#42)	MAJOR/ MINOR (a)	ON	test port PCSSpp r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. There are two possible alarm levels for this error: Major alarm and Minor alarm. A Major alarm is raised if the total number of GPTD ports currently in service is less than or equal to one half of the administered threshold number. Otherwise, a Minor alarm is raised. In either case, run the Short Test Sequence against the GPTD port and follow the error code procedures for the individual tests.

   The threshold number of GPTD ports for service is administered using the **change system-parameters maintenance** command.

b. This error indicates the GPTD port is having problems detecting call progress tones. If this error is being constantly logged, then the Tone Detector circuit pack containing the defective GPTD port should be replaced.

c. The GPTD port lost its translation. Testing the GPTD port is sufficient to reload its translation. If testing the GPTD port does not clear the error, then the Tone Detector circuit pack containing the defective GPTD port should be replaced.

d. This error type indicates that the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented below when inspecting errors in the system. By clearing error codes associated with the *Tone Detection Verification Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test verifies that the call progress tones detection and the tone level measurement capabilities of the GPTD port are functioning properly.

Table 11-168. TEST #42 Tone Detection Verification Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test or there was an Internal System Error.
1	ABORT	The system could not allocate all the resources needed to test the call progress tones.
1001	ABORT	The system was unable to put the GPTD port in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, test the TDM-BUS via the **test tdm [1|2]** command. Refer to the TDM-BUS (TDM Bus) Maintenance documentation for details. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This can happen when the system is heavily loaded or there is not a Tone-Clock circuit pack in the port network when this test is being executed. 1. Make sure there is a Tone-Clock circuit pack in the same port network. 2. If a Tone-Clock circuit pack is missing, install one in the same port network. 3. Allow about one minute for the Tone-Clock maintenance to run on the newly inserted Tone-Clock circuit pack. 4. Retry the command at one-minute intervals a maximum of five times. 5. If the test continues to abort, escalate the problem.

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Table 11-168. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2006	ABORT	This abort code indicates that the active Tone-Clock circuit pack might not be functioning properly. If there is more than one Tone Detector circuit pack in the system, then the problem can be either with the Tone-Clock circuit pack or the Tone Detector circuit pack. This also could be caused by the companding mode administered for the system not matching that of the Tone Detector circuit pack. 1. Make sure that companding mode of the system matches that of the Tone Detector (TN748's for Mu-law systems and TN420's for A-law systems). 2. Test the active Tone-Clock circuit pack in the port network. This test is being executed via the **test tone-clock qualifier** system technician command. "Qualifier" is the carrier of the active Tone-Clock circuit pack to be tested. Valid qualifiers are: a, b, 1a, 1b, 2a, and 2b. Refer to the TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for details. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
101-122	FAIL	1. Run the Short Test Sequence: **test port PCSSpp sh r 1**. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore the system performance to normal, replace the Tone Detector circuit pack containing the defective GPTD port.

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Table 11-168. TEST #42 Tone Detection Verification Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1022	FAIL	[G3iV2-386] The system detection mode is administered to one of the broad band schemes, and the Tone Detector is not a TN420C, (the TN420C is the only circuit pack that has this capability). GPTD ports on other types of Tone Detector circuit packs are placed in the out-of -service mode since they cannot provide the administered function. 1. Change the tone detection mode administered on the system-parameters country-options form (see *DEFINITY Communications System Generic 3 Implementation*, 555-230-653). 2. Or, remove all non-TN420C tone detector circuit packs from the system.
	PASS	Tone Detection Verification is successful. The GPTD port is able to detect all call progress tones and perform level measurements of test tones.

Tone Detector Audit/Update Test (#43)

The GPTD port is refreshed with all time slot information and sanity audit is performed on the GPTD port.

Table 11-169. TEST #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The system was not able to allocate all the resources needed for this test. 1. Wait one minute and try again.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Hardware audit failed. 1. Run the Short Test Sequence: **test port PCSSpp short repeat 1**. 2. If the problem persists, the system is still operating properly but system capacity will be reduced. To restore the system performance to normal, replace the Tone Detector circuit pack containing the defective GPTD port.
	PASS	The GPTD port has been successfully refreshed with its translation.

HYB-BD (Hybrid Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
HYB-BD	MIN	test board PCSS sh	Hybrid Line Circuit Pack
HYB-BD	WRN	test board PCSS sh	Hybrid Line Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also HYB-LINE (Hybrid Line) Maintenance documentation for related line information.

HYB-LINE (Hybrid Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
HYB-LINE	Minor	test port PCSSpp l	Hybrid Line
HYB-LINE	Warning	test port PCSSpp l	Hybrid Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

Hybrid Line is the user-friendly name for Hybrid Line, which was previously used to denote the Multifunction Analog Telephone. The Hybrid Line set is also known as an SCS (Small Communications System).

The TN762B Hybrid Line circuit pack supports eight of these multifunction analog telephone sets, as shown in the following figure. The Hybrid Line sets use three pairs of wires: an analog voice pair, a transmit/receive pair, and a power pair.

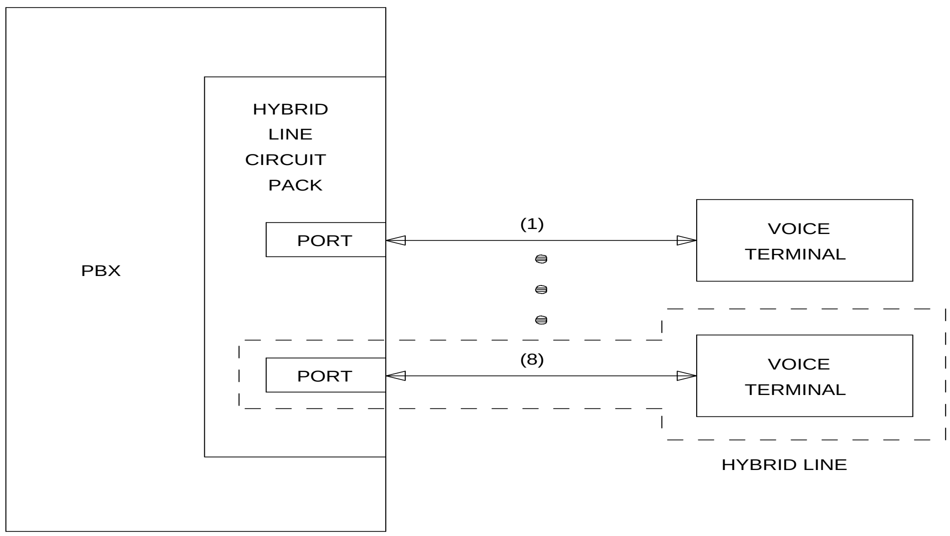

Figure 11-39. Hybrid Station Interactions

This section refers only to the HYB-LINE (Hybrid Line) maintenance that is performed. Please note that the HYB-LINE (Hybrid Line) maintenance is closely related to, and interacts with, the HYB-BD (Hybrid Line circuit pack) maintenance in some instances. Some of the results of maintenance testing of the Hybrid Line may be affected by the health of the Hybrid Line circuit pack. This interaction should be kept in mind when investigating the cause of reported Hybrid Line problems.

There are instances in this section where "service states" of a station are mentioned. It is helpful to understand what is meant by the different service states that may exist. An explanation of these service states follows:

- Out-of-Service–The port, and thus the station, have been removed from service. A busyout of a port causes it to be out-of-service.
- Ready-for-Service–Once a port on the circuit pack has been put into service, the voice terminal must communicate that it is present. The time between these two events is the time when the terminal is in the ready-for-service state.
- In-Service–Once the system has received a message from the voice terminal communicating that it is present, the station is put into the in-service state. The terminal can also be forced into the in-service state if it goes off-hook while it is in the ready-for-service state.

When the **status station** command has been run, and the status screen appears, the status is reported as either out-of-service or in-service, which mean exactly as stated in the above list, or disconnect, which means the station is in the ready-for-service state.

Hardware Error Log Entries and Test to Clear Values

Table 11-170. Hybrid Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	Any	None	WARNING	OFF	
15 (b)	Any	Hybrid Audits Test (#61)			
18 (c)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
130 (d)		None	WARNING	ON	test port PCSSpp sh
257 (e)	40988	None	MIN/WRN[2]	OFF	
513 (f)	40965	Hybrid Line Audits Test (#61)	WARNING	OFF	test port PCSSpp sh r 4
769 (g)		Remote Dig Loop Around Test (#59)	WARNING	OFF	test port PCSSpp sh r 3
1025		Hybrid & Conf. Circuits Test (#57)	MIN/WRN[2]	ON	test port PCSSpp l r 3
1281 (h)		Local Digital Loop Around Test (#58)	WARNING	ON	test port PCSSpp l r 3
1537 (i)	40968	None	WARNING	OFF	
1793		TDMNPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 3
2049 (j)	32770	None			
2049 (k)	40967	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major or Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. Indicates a defective data link. An off-board problem was detected by port circuit. Verify that the Hybrid set is connected and that the EPF test passes. If data transmission problems are experienced, check for defective wiring or a defective voice terminal, or move terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired after a predetermined period of time.

b. This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate associated errors (if any).

c. This error type is logged when the port in question is busied out by maintenance personnel. Make sure port is released from busyout via the **release port PCSSpp** command.

d. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. This indicates that the EPF has been turned off due to an overcurrent condition at the voice terminal. Check for defective wiring or a damaged jack, and make sure the voice terminal is a Hybrid set. Once the problem has been resolved, the alarm is retired after a predetermined period of time.

f. This indicates that the voice terminal has probably been disconnected or that there is a problem in the wiring to the terminal. Make sure that the voice terminal is connected or check for defective wiring to the voice terminal.

g. Note that Error Types 769 and 1281 by themselves create Warning alarms only, but if both are present, a Minor alarm is logged.

h. This indicates that there is something wrong with the data link to the voice terminal. An in-line maintenance error has generated an off-board warning. Ignore it if there are no complaints. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack.

i. This indicates that the station went off-hook while in the disconnect state. Use the **status station** command to determine the state of the station. The off-hook should have moved the station to in-service. No system technician action is necessary.

j. This is the code that is generated when the link between the circuit pack and the voice terminal is successfully reset. No system technician action is necessary.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Local Digital Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Local Digital Loop Around Test (#58)		X	ND
NPE Crosstalk Test (#6)		X	ND
Hybrid Electronic Power Feed Test (#56)		X	ND
Hybrid Circuit and Conference Circuit Test (#57)		X	ND
Remote Digital Loop Around Test (#59)	X	X	ND
Station Lamp Update Test (#60)	X	X	ND
Station Audits Test (#61)	X	X	ND
Ringer Update Test (#62)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-171. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-171. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-171. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. This only applies to analog stations. The default for this field is ‘y,’ so you may want to determine why it has been turned off for this station. 1. To enable test, set the Test field on the station administration screen for the particular analog station being tested to ‘y.’ Use the **change station <extension>** command.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.

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Table 11-171. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Retest the board when the faults from steps 1 and 2 are cleared.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

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Table 11-171. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Electronic Power Feed Test (#56)

In this test, the software requests that the EPF be turned on for a given port. An attempt is made to turn on the power unit from the station. If no current is being drawn, this probably indicates that the station is not connected. If an overcurrent condition is sensed (that is, too much current is being drawn), this may indicate a short in the loop or a defective voice terminal. Depending on what condition is sensed, a message is returned stating that either the EPF was turned on successfully with no problems or that an overcurrent condition is sensed. This test is repeated once more five seconds later. If either test is not successful, the test aborts (see first ABORT entry in the table below).

Table 11-172. TEST #56 Hybrid Electronic Power Feed Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-172. TEST #56 Hybrid Electronic Power Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	EPF test passed. The message to turn on the power to the station was successfully sent to the port. 1. Although this test never returns a FAIL result, after running this test, the Error Log should be checked for any entries with Error Type 257 to examine the real results of this test. 2. If Error Type 257 does not appear in the Error Log within 10 seconds after completion of this test, it is safe to assume that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station, if available, and check that all the feature buttons are operating. 3. If Error Type 257 appears in the Error Log, this indicates some problem with the power to the station. The system technician should check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Circuit and Conference Circuit Test (#57)

This test checks the amount of reflection from the Hybrid loop around circuitry and a Conference Test. Please be aware that if no station is connected to the port being tested, the results of the test are not valid. The Tone-Clock circuit pack places a 1004-Hz tone on a time slot that the port circuit is listening on. A GPTD is connected to another time slot that the same port circuit is talking on. The on-board microprocessor places the port in the loop around mode and the GPTD measures the level of the reflected signal.

The Conference Test is performed after the Circuit Test. The Conference Circuit Test verifies that the NPE is able to listen to several test tones and correctly conference them together. The test is executed in two parts. The first half of the test checks the operation of the NPE's first three conference channels. The NPE is put in the loop around mode and instructed to talk on a selected time slot and listen to the 1004-Hz tone using the first three Conference Channels. The signal level and noise level of the conferenced output are then measured using a GPTD and checked to verify that they are within an acceptable range.

The second half of the Conference Test checks the operation of the NPE's remaining four Conference Channels and follows the same procedure as the preceding paragraph.

Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	Conference Test failed. User may be able to use conference circuit without difficulty in some cases. In other extreme cases, conference calling will be totally restricted. The failure may be due to off-board circumstances, the most common of which is an off-hook occurring during the test. Also, check the error logs against the GPTD-BD, the TONE-BD, and the TONE-PT. 1. This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. 2. Then, issue the **display port** and the **status station** commands to determine if the station is idle. If it is idle, issue the **test port** command for this port. 3. If test continues to fail, issue the **busyout port** and the **release port** commands, and then retest the port. 4. It is possible that the port may still be functional from a user's point of view.

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Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
57	FAIL	Hybrid Circuit Test failed. This could result in noisy or bad connections. 1. This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. 2. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using the **test board PCSS short** command. 3. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 4. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Hybrid Line circuit pack. **NOTE:** If the Hybrid Circuit and Conference Circuit Test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, the 631DB AC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain either a TN736 or a TN752 power unit circuit pack OR a 631DB AC power unit, *but not both types of power units.* To investigate problems with a 631DB AC power unit, refer to CARR-POW (Carrier Port Power Unit for AC-Powered Systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to CARR-POW (Carrier Port Power Unit for DC-Powered Systems) Maintenance documentation.
	PASS	Hybrid Circuit and Conference Circuit Test passed. The hybrid circuitry is transmitting properly. 1. If complaints still exist, investigate by using other port tests, and by examining the station, wiring, and connections.

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Table 11-173. TEST #57 Hybrid Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Line Local Digital Loop Around Test (#58)

This test checks the control channel between the SPE and the port's digital circuitry. The SPE sends transparent data to the on-board microprocessor and compares the data echoed back. This test is repeated three times.

Table 11-174. TEST #58 Hybrid Line Local Digital Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-174. TEST #58 Hybrid Line Local Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1,2,3	FAIL	The control channel between the processor and the port is not transmitting properly. This port is not operable. 1. Retry the test. 2. If the failure still occurs, issue the **busyout** and the **release busy** commands, and then retest. 3. If the failure is occurring on more than one port on the board, suspect the board. 4. If the failure is occurring on several boards in the same carrier, escalate the problem. 5. If the failure still occurs and appears to be isolated to one port, check all wiring to the set and all set connections. 6. Replace the circuit pack as a last resort.

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Table 11-174. TEST #58 Hybrid Line Local Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Hybrid Line Local Digital Loop Around Test passed. The control channel is transmitting properly. 1. If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.

Continued on next page

Table 11-174. TEST #58 Hybrid Line Local Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Line Remote Digital Loop Around Test (#59)

This test checks the digital control pair from the port circuit to the terminal. The on-board microprocessor sends a message to the terminal and checks for a proper return message. This test is repeated three times, with two out of the three attempts passing being sufficient for this test to pass. [G1] This test will run if the station is in-service or out-of-service.

Table 11-175. TEST #59 Hybrid Line Remote Digital Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	ABORT	A request for a remote station audit aborted even though all internal resources were correctly allocated. 1. Look in the error log for error type 18 (port busied out) for this port. If this error type is present, release the port via the **release port UUCSSpp** command or the **release station extension** command, and then run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.

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Table 11-175. TEST #59 Hybrid Line Remote Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-175. TEST #59 Hybrid Line Remote Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1,2,3	FAIL	No response was received within the allowable time period on one of the transmissions to the terminal. This indicates that something is wrong with the data link to the voice terminal. This could be a sleeping set problem or it may be due to wiring or an unplugged or defective set. 1. Check for errors in the error log, for example, error 1537. 2. Remotely issue the **busyout** and **release busy** commands, and run the short test sequence on the port to check for other errors associated with the port or terminal. 3. Check the wiring to the set if it appears that the terminal is not responding to any tests; otherwise, replace the terminal and rerun the test. 4. If the test still fails, replace the circuit pack and reconnect the original terminal.
	PASS	Hybrid Line Remote Digital Loop Around Test passed. The hybrid circuit pack is sending and receiving proper messages to and from the voice terminal. 1. If problems still exist, investigate using other circuit pack tests and by examining the station, wiring, and connections.

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Table 11-175. TEST #59 Hybrid Line Remote Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Line Lamp Updates Test (#60)

For this test, the software lights the lamps on the terminal based on the status record contained in the processor. The lamp updates run only if the station is in-service.

Table 11-176. TEST #60 Hybrid Line Lamp Updates Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	A request for a remote station lamp update aborted even though all internal resources were correctly allocated. 1. Look in the error log for error type 18 (port busied out) for this port. If this error type is present, release the port via the **release port UUCSSpp** command or the **release station extension** command, and then run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
2	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
3	ABORT	The station is in a ready for service or an out of service state. This may be due to wiring or an unplugged or defective set. 1. Make sure terminal is connected and the wiring is correct. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-176. TEST #60 Hybrid Line Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	Hybrid Line Lamp Updates completed successfully. 1. If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.

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Table 11-176. TEST #60 Hybrid Line Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Line Audits Test (#61)

This is a series of three tests that are classified as audits. These audits abort if attempted on an out-of-service station. The tests are as follows:

- Switchhook Audit - This is an update of the SPE records according to the circuit packs' records.
- Bad Scan Inquiry - A message is sent uplink that contains a count that is generated due to certain events relating to the data link conditions. This is an indication of data transmission problems between the Hybrid circuit pack and the voice terminal.
- EPF Inquiry - The status of the Electronic Power Feed is sent uplink. Possible conditions are: EPF-on-ok, EPF-off, EPF-no-load, and EPF-on-overcurrent.

Table 11-177. TEST #61 Hybrid Line Audits Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error
1	ABORT	The test was aborted due to an internal system error during the switchhook audit.
2	ABORT	Internal System Error occurred during bad scan inquiry audit. 1. Make sure that the station is not in an out of service state. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
3	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, the release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-177. TEST #61 Hybrid Line Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook), if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook), if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.

Continued on next page

Table 11-177. TEST #61 Hybrid Line Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	Hybrid Line Audits Test passed. 1. Although this test always return a PASS result, it may enter Error Types 257 or 513 into the Error Log. To determine if there are any problems that don't show up in the test result, look for these error types in the Error Log. 2. If these errors appear in the Error Log, or if user complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Hybrid Line Ringer Update Test (#62)

In this update, a "ringer on" or a "ringer off" message is sent to the firmware to start and stop the ringer on the set.

Table 11-178. TEST #62 Hybrid Line Ringer Update Test

Error Code	Test Result	Description/ Recommendation
3	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, the release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook), if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-178. TEST #62 Hybrid Line Ringer Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Hybrid Station Ringer Update passed 1. If complaints still exist, investigate using other circuit pack tests on this circuit pack, and by examining the terminal, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

INADS (INADS Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
INADS	none	test inads-link	INADS Link

The INADS Link MO represents the software and communications link required by the switch to make a call to the Initialization and Administration System (INADS). The purpose of the INADS Link MO is to check the communications link between the DEFINITY Generic 1 and INADS and verify that the alarm notification process works correctly. An INADS technician can test the process remotely to verify that alarms are reported to INADS, or a system technician may want to test the connection while on-site at installation time or during subsequent service calls.

Although the INADS Link MO is never alarmed, the errors are logged. The errors are only logged as a result of the **test inads-link** command being issued.

Hardware Error Log Entries and Test to Clear Values

The Hardware Error Log entries are described as part of the INADS Link Test description.

Short and Long Test Sequences

The **test inads-link** command is different from other test commands. This command does not have a long or short option, and the test on the INADS Link does not have an associated test number. When the

command is different from other test commands. This command does not have a long or short option, and the test on the INADS Link does not have an associated test number. When the **test inads-link** command is issued, the user immediately sees either the "Command successfully completed" or "Command failed" message.

command is issued, the user immediately sees either the "Command successfully completed" or "Command failed" message.

INADS Link Test (no test number)

The INADS Link Test attempts to place a call to INADS (in the background) to verify the communications link to INADS. When the **test inads-link** command is entered, the user immediately sees either "Command successfully completed" or "Command failed." The "Command failed" message appears when a previously run command is entered, the user immediately sees either "Command successfully completed" or "Command failed." The "Command failed" message appears when a previously run **test inads-link** command is in progress or the system has active alarms which must be reported to INADS. The "Command successfully completed" means the switch will start the attempt to call INADS in two minutes (the test still runs even if Alarm Origination is disabled). The two-minute delay allows a remote INADS technician time enough to hang up the call and thus free up the INADS line so that the switch can call INADS back. As error conditions are encountered, errors are logged against INADS. Error codes 1 through 9 can be logged if the test result was "Command successfully completed" and Error Codes 10 and 11 can be logged if the test result was "Command failed." An error is also logged against INADS if the call to INADS finally succeeds. The INADS software (release 3.2 or later) recognizes this special "test inads" type of alarm and automatically opens and then closes a trouble ticket which indicates that the reason for the trouble ticket is a command is in progress or the system has active alarms which must be reported to INADS. The "Command successfully completed" means the switch will start the attempt to call INADS in two minutes (the test still runs even if Alarm Origination is disabled). The two-minute delay allows a remote INADS technician time enough to hang up the call and thus free up the INADS line so that the switch can call INADS back. As error conditions are encountered, errors are logged against INADS. Error codes 1 through 9 can be logged if the test result was "Command successfully completed" and Error Codes 10 and 11 can be logged if the test result was "Command failed." An error is also logged against INADS if the call to INADS finally succeeds. The INADS software (release 3.2 or later) recognizes this special "test inads" type of alarm and automatically opens and then closes a trouble ticket which indicates that the reason for the trouble ticket is a **test inads-link** command. The trouble ticket alarm contains a **TESTING INADS LINK** description field.

After entering the command, it may take as long a nine minutes for the switch to place the call and for INADS to respond. The Error Log should be examined (use the category **inads**) 10 minutes after successfully entering the command to determine if the call was successful.

Use the following table to interpret the Error Log entries.

Table 11-179. INADS Link Error Log Entries Test

Error Code	Test Result	Description/ Recommendation
1	0	The call was successfully placed to INADS. No trouble found.
2	0	Informative error indicating that alarm origination was disabled at the time of the test. The test still runs even if alarm origination is disabled. 1. If Alarm Origination is desired, then enable this feature via the Maintenance-Related System Parameters Form. 2. Repeat the test.
3	0	The INADS connection is currently in use. 1. Wait 10 minutes and retry this command.
4	0	INADS did not answer the alarm origination call. 1. Verify INADS is up and running. 2. Verify the INADS phone number and switch product id are correct via the Maintenance-Related System Parameters Form. 3. Enable alarm origination via the Maintenance-Related System Parameters Form and test the PR-MAINT (Maintenance/Tape Processor) by issuing the **test processor a|b** command. If PR-MAINT Tests #102 and #103 do not pass, then refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation. 4. Retry the command.
5	0	No INADS phone number administered. 1. Administer the INADS phone number via the Maintenance-Related System Parameters Form. 2. Retry the command.

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Table 11-179. INADS Link Error Log Entries Test — *Continued*

Error Code	Test Result	Description/ Recommendation
6	0	INADS did not send the acknowledgment message to the "test inads alarm" message. 1. Verify the INADS phone number and switch product id are correct via the Maintenance-Related System Parameters Form. 2. Verify INADS is up and running. 3. Retry the command.
7	0	INADS sent a negative acknowledgment to the "test inads alarm" message.
8	0	Internal System Error; System received an invalid return code.
9	0	Internal System Error 1. Try the command again at 1 minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
10	0	There is already a **test inads-link** command in progress. 1. Wait 10 minutes for the present command to finish. 2. Review the results of the present command by viewing the Error Log and selecting the category "inads-link."
11	0	The switch is trying to report alarms to INADS. The test cannot be run at this time. 1. Wait 10 minutes and retry the command.

ISDN-LNK (ISDN-PRI Signaling Link Port) [G1]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
ISDN-LNK[1]	MINOR	test port PCSS24 l	ISDN-PRI Signaling Link Port
ISDN-LNK	WARNING	test port PCSS24 sh	ISDN-PRI Signaling Link Port

1 For additional repair information, see also DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation.

An ISDN-PRI Signaling Link Port is known as a D-channel. The ISDN-PRI interface uses out-of-band signaling as opposed to robbed-bit, in-band signaling (Figure 11-40). The user information (for example, digitized voice, digital data) channels are known as bearer channels (B-channels); DS1 ISDN Trunks are B-channels and they simply carry the user traffic. The call control signaling for the B-channels is combined and carried over the separate ISDN-PRI Signaling Link Port D-channel.

The ISDN-PRI Signaling Link Port (ISDN-LNK) and the associated DS1 ISDN Trunk (ISDN-TRK) use ports on a TN767 DS1 Interface circuit pack (the TN722 cannot be used for this application). The DS1 ISDN Trunk, also referred to as B-channels, may use any of the first 23 ports, but the ISDN-PRI Signaling Link Port, also referred to as the D-channel, must be the 24th port. A problem with the ISDN-PRI Signaling Link Port (D-channel) has an effect on all of the associated DS1 ISDN Trunk (B-channels) since, without it, no call control information can be conveyed to the far-end switch. Stable calls may remain operational, but no new calls can be made.

The ISDN-PRI Signaling Link Port itself depends on two other entities: the TN767 DS1 Interface circuit pack it resides on and the Processor Interface Link that provides the link to the processor. If there are problems with the ISDN-PRI Signaling Link Port, also investigate the TN767 DS1 Interface circuit pack and the Processor Interface Link.

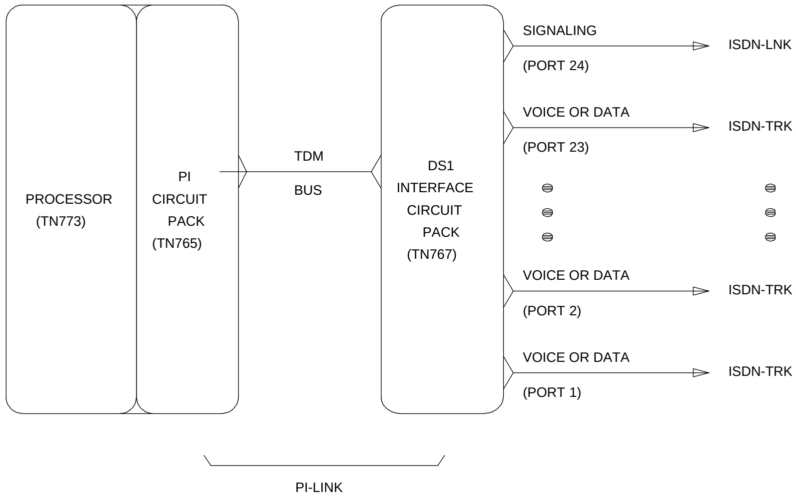

Figure 11-40. ISDN-PRI Signaling Link Port Interactions [G1]

Hardware Error Log Entries and Test to Clear Values

Table 11-180. ISDN-PRI Signaling Link Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSS24 sh r 1
1 (a)	Any	None			
18	0	busyout port PCSS24	WARNING	OFF	release port PCSS24
130(b)		None	WARNING	ON	test port PCSS24 sh
257 (c)	0	Signaling Link Hardware Check Test (#259)			test port PCSS24 sh r 1
769 (d)	0	Signaling Link Hardware Check Test (#259)			test port PCSS24 sh r 1
1537 (e)		NPE Crosstalk Test (#6)	MINOR	ON	test port PCSS24 l r 3
1793 (f)	Any	None			test port PCSS24 sh r 1
2049 (g)	0	None	WARNING	OFF	test port PCSS24 sh r 1
2305 (h)	Any	Remote Layer 3 Query Test (#260)			test port PCSS24 sh r 1
3840 and above (i)	port number	None			none

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This switch sent a message to the far-end switch which did not respond in the allotted time. This could be due to:

   1. link failure
   2. congestion or outage at the far-end switch

   The Aux Data field contains protocol-specific information and no action is required. It takes two and half hours to clear the alarm since this counter uses a "leaky bucket" strategy.

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. This error indicates that the link connection has been lost for more than 90 seconds. All DS1 ISDN Trunk B-channels controlled by the D-channel are moved to the maintenance/far-end state. This condition does not affect active calls, but removes these B-channels from the trunk hunt group so that they cannot be selected for new outgoing calls. Refer to ISDN-TRK (DS1 ISDN Trunk) Maintenance documentation for information on ISDN Trunk maintenance states. The switch automatically attempts to recover the link.

d. This error indicates a problem with the Processor Interface Link on which the ISDN-PRI Signaling Link Port depends. Pay particular attention to the results of Test #259 (Signaling Link Hardware Check) in the test sequence. See PI-LINK (Processor Interface Link) Maintenance documentation for details. The associated DS1 ISDN Trunk B-channels are eventually affected as well. The B-channels are moved to the maintenance/far-end state.

e. The actual alarming level depends on the options chosen via the **set options** command on the system administration terminal. ISDN-PRI Signaling Link Port alarms are treated as Station alarms, and their default alarming option is to downgrade all alarms to Warning. The value shown in the preceding table indicates the normal, unfiltered case (option "y" on the Set Options form).

f. This error indicates a problem with the TN767 DS1 Interface circuit pack on which the ISDN-PRI Signaling Link Port depends. Pay particular attention to Test #259 (Signaling Link Hardware Check) in the test sequence. Refer to DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation for details. The associated DS1 ISDN Trunk B-channels are eventually affected as well (calls may be dropped and the trunks may be placed in an out-of-service state).

g. This error indicates a problem with part of the Processor Interface Link. Pay particular attention to the results of Test #259 (Signaling Link Hardware Check) in the test sequence.

h. This error indicates a failure of the Remote Layer 3 Query, Test #260. A specific message was sent to the far-end switch and it did not respond within the allotted time. Investigate elements of the Processor Interface Link for both this switch and the far-end switch. If Test #260 fails twice in a row, the DS1 ISDN Trunk (B-channels) are alarmed and made unavailable for outgoing calls (although incoming calls are still accepted since B-channels are moved to the maintenance/far-end state). When Test #260 succeeds and the far-end switch starts responding properly, the DS1 ISDN Trunk (B-channels) is placed back in normal operation and its alarms are retired.

i. This error type is used to report certain error messages received by the ISDN-PRI Signaling Link Port (D-channel) for one of its associated DS1 ISDN Trunks (B-channels). The Aux Data field shows on which DS1 ISDN Trunk the message was received for (the port number).

The exact error type logged is some number greater than 3840. The error type is computed as 3840+X where X refers to a Cause Value as defined by the ISDNPRI Specification.

Note that there is no Test to Clear Value for these error types; when selected ISDN cause values are received, they are placed in the log so that the data is not lost, but no direct action or alarming is done based solely on their reception. They simply provide added data that may prove useful when tracking down obscure networking and routing problems. The following table gives more information.

Table 11-181. ISDN-PRI Signaling Link Port Error Log Entries , 3840 and above (i)

Error Type	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cannot be accessed.	1. From the circuit pack and port number (in the Aux Data field), determine the trunk group that the error was reported against. 2. Check all routing patterns containing this trunk group for validity of inter-exchange carriers requested (IXC field).
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch which did not respond in the allotted time.	Follow same recommendations as for Error Type 1.

Continued on next page

Table 11-181. ISDN-PRI Signaling Link Port Error Log Entries , 3840 and above (i) — *Continued*

Error Type	Description	Recommendation
3890	A request to use a network service (for example, SDN) has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. 1. From the circuit pack and port number (in the Aux Data field), determine the trunk group that the error was reported against. 2. Display the Trunk Group form. If the trunk group is Call-by-Call (Service Type is "cbc"), check all Routing Pattern forms containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field on the Trunk Group form contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks and no other cause can be found, escalate to next tier and provide them with this Error Log information.

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Table 11-181. ISDN-PRI Signaling Link Port Error Log Entries , 3840 and above (i) — *Continued*

Error Type	Description	Recommendation
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	First, eliminate any transitory state mismatch problems by issuing the **test port PCSSpp** command for the trunk port shown in the Aux Data field. Test #256 (Service State Audit) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks and no other cause can be found, escalate to next tier and provide them with this Error Log information.
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks and no other cause can be found, escalate to next tier and provide them with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks and no other cause can be found, escalate to next tier and provide them with this Error Log information.

Continued on next page

Table 11-181. ISDN-PRI Signaling Link Port Error Log Entries , 3840 and above (i) — *Continued*

Error Type	Description	Recommendation
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the recommendations for error number 3890.
3928	A call was denied because of a basic incompatibility between the type of call and either the facilities selected by the routing pattern or the called user.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks. Determine the trunk group from the circuit pack and port number (in the Aux Data field) and then check the BCC fields of the pertinent routing patterns. Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence.

REMINDER: The command line entry to test the ISDN-LNK MO is: **test port PCSS24 (sh** or **l)**

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Signaling Link Hardware Check Test (#259)	X	X	ND
Remote Layer 3 Query Test (#260)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete. This test runs only if the Processor Interface link corresponding to this ISDN-LNK MO is busied out by system technician. The Processor Interface link number can be determined from the Communication-Interface Links form.

Table 11-182. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources for this test are not available. The ISDN-PRI link may be up and servicing calls. First, obtain the ISDN-PRI link number (lnk-no) from the Communication-Interface Links form by issuing the **display communication-interfaces links** command. Then, determine the status of the ISDN-PRI link via the **status link lnk-no** command. If the link is in-service, this test aborts. Therefore, to run this test, the link must be busied out. No new ISDN-PRI calls can be made while the link is in the busied-out state. 1. If the test must be run, then busyout the link. 2. Retry the command. 3. If it continues to abort with Error Code 1000, then escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-182. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.

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Table 11-182. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the DS1-BD Interface circuit pack.
	PASS	The port is able to communicate over the TDM Bus.

Signaling Link Hardware Check Test (#259)

This ISDN-PRI Signaling Link Port D-channel depends on the health of the TN767 DS1 Interface circuit pack and the Processor Interface Link. This test checks the hardware to ensure the basic physical connectivity of the link between the Processor Interface Link (includes the TN765 circuit pack), the TN767 DS1 Interface circuit pack, and on to the far-end switch (Figure 11-41). (The next test in the sequence, Test #260, carries this one step further and checks the link starting from the switch processor through to the far end).

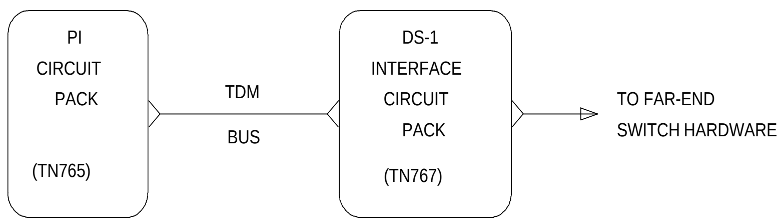

Figure 11-41. Signaling Link Hardware Check (Test #259)

Table 11-183. TEST #259 Signaling Link Hardware Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1010	ABORT	The port has been busied out and the test continues to abort until the port is put back into service. 1. Release port PCSSpp. 2. Release link lnk-no. 3. Wait five minutes until the link is back up and try again.

Continued on next page

Table 11-183. TEST #259 Signaling Link Hardware Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4	FAIL	There is a problem with the Processor Interface Link. No DS1 ISDN Trunk (B-channel) calls can be made until the problem is resolved. 1. The PI Signaling Link could be restarting. Wait a few minutes and then retry the test. If the test still fails, continue with Step 2. 2. Examine the Communication-Interface Links Form to determine which link is down. Find the one that matches the DS1 Interface circuit pack on which this ISDN-PRI Signaling Link Port resides. Then consult the procedures for PI-LINK (Processor Interface Link).
8	FAIL	There is a problem with the TN767 DS1 Interface circuit pack. No DS1 ISDN Trunk (B-channel) calls can be made until the problem is resolved. 1. Consult the procedures for TN767 DS1 Interface circuit pack.

Continued on next page

Table 11-183. TEST #259 Signaling Link Hardware Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
9	FAIL	There is a problem establishing or maintaining the communications connection with the far-end switch. This might simply be caused by a problem with the administration of the link, or it might be due to a failure of the transmission network. 1. Check the options chosen for the TN767 DS1 Interface circuit pack and ensure that they are compatible with those chosen for the equivalent equipment on the far-end switch. Pay particular attention to the network/user selection on the DS1 form. Also, check the CSU options. 2. Check the TN767 DS1 Interface circuit pack and measurements data. 3. Status processor (Processor Channel) provides specific information as to whether or not the link in question is up.
	PASS	The basic physical connectivity of the link between the Processor Interface Link (including the TN765 circuit pack), the TN767 DS1 Interface circuit pack, and on to the far-end switch is intact and functional. One might try this test repeatedly to ensure the link is up and uncover any transitory problems.

Remote Layer 3 Query Test (#260)

This test runs only if the previous test (#259) succeeded. If Test #259 fails, this Test (#260) aborts with an error code of 1113. The previous test checks the communications path starting at the Processor Interface Link and on to the far-end switch. This test takes it one step further by checking the communications path starting from the processor (from the processor, through the Processor Interface Link and TN767 DS1 Interface circuit pack, and on to the far-end switch) (see Figure 11-42). A special ISDN message is sent to the far-end switch, which must respond within an allotted amount of time. This test is designed to ensure that the communications path between the two switches is up and operational, and that the two switches can properly exchange ISDN control messages. The test passes if a message is successfully transmitted. The test does not fail.

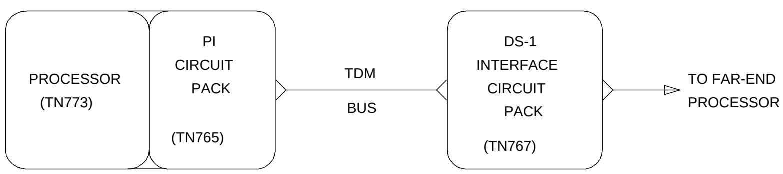

Figure 11-42. Remote Layer 3 Query (Test #260)

Table 11-184. TEST #260 Remote Layer 3 Query Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error OR Administration Problem. 1. First, check to see if any DS1 ISDN Trunks (B-channels) are administered. If there are none, then this is a NORMAL ABORT. You cannot run this test until at least one DS1 ISDN Trunk is administered. However, if at least one DS1 ISDN Trunk is administered, then there is an internal system error. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1006	ABORT	Currently there are no associated DS1 ISDN Trunks (B-channels) in an ISDN in-service or maintenance service state. THIS IS A NORMAL ABORT. 1. Refer to PI-LINK (Processor Interface Link) or ISDN-LNK (ISDN-PRI Signaling Link Port) Maintenance documentation for reasons why the trunks are not available.
1113	ABORT	The Signaling Link is down, so messages cannot be sent to the far-end switch. 1. Examine results of Test #259 and follow recommendations provided there.

Continued on next page

Table 11-184. TEST #260 Remote Layer 3 Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	A message was composed and sent to the far-end switch. The ISDN PRI specification allows up to two minutes for a reply. Check the Error Log for this ISDN-PRI Signaling Link Port (ISDN-LNK) for errors of Type 2305 for evidence of a Remote Layer 3 Query failure. If no new errors were logged since this test was run, then this switch and the far-end switch processor can exchange call control messages. If there is still a problem with a particular DS1 ISDN Trunk (B-channel), busy it out and run the Long Test Sequence, paying particular attention to the results of Test #258 (ISDN Test Call). If the problem persists and the above action has not revealed the cause, escalate the problem.

ISDN-LNK (ISDN-PRI Signaling Link Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ISDN-LNK[2]	MINOR	test port PCSSpp l	ISDN-PRI Signaling Link Port
ISDN-LNK	WARNING	test port PCSSpp sh	ISDN-PRI Signaling Link Port

1 Where 'pp' is '24' for 24-channel interfaces, and '16' for 32-channel interfaces.

2 For additional repair information, see also DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (Universal DS1 Interface Circuit Pack) Maintenance documentation.

NOTE:
Use this Maintenance Object (ISDN-LNK) for maintenance tests , alarms, and hardware errors when the "ISDN-PRI over PACCON" option on the *system-parameters customer* form is set to a "**n**". When the ISDN PRI over PACCON is set to "**y**" use Maintenance Object ISDN-PLK.

When the ISDN-PRI over PACCON option is set to "**n**", the ISDN-PRI D-channel call control messages are transmitted over the TDM bus to the Processor Interface circuit pack and you must use this Maintenance Object for PRI Link problems.

An ISDN-PRI Signaling Link is known as a D-channel. D-channels are used to transmit call control signaling for B-channels. The call control signaling for the B-channels is combined and carried over separate ISDN-PRI D-channels. User information (for example, digitized voice, digital data) channels are known as bearer channels (B-channels); DS1 ISDN Trunks are B-channels and they carry the user traffic. PRI endpoint ports are also B-channels that can carry Wideband traffic.

The ISDN-PRI Signaling Link Port (ISDN-LNK) and the associated DS1/UDS1 ISDN Trunk (ISDN-TRK) or PRI endpoint port (PE-BCHL) use ports on a TN767 or TN464B or later DS1/UDS1 interface circuit pack (the TN722 cannot be used for this application). The TN767 is used for 24 channel 1.544 Mbps systems. The TN464B is used for 32 channel 2.048 Mbps systems. The TN464C or later can be used for either 24 or 32 channel systems. A description of these circuit packs appears in DS1-BD or UDS1-BD maintenance documentation.

In a 24 channel system, the DS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the first 23 ports. The ISDN-PRI Signaling Link Port must be the 24th port. In certain configurations (NFAS), the 24th port may be used as a B-channel. Refer to the ISDN-PRI Signaling Group (ISDN-SGR) Maintenance documentation for further details.

In a 32 channel system, the DS1/UDS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the ports 1-15 or 17-31, but the ISDN-PRI Signaling Link Port must be the 16th port. In certain configurations (NFAS), the 16th port may be used as a B-channel. Refer to the ISDN-PRI Signaling Group (ISDN-SGR) Maintenance documentation for further details.

ISDN-LNK handles maintenance and recovery for the D-channel port on the DS1 carrying the signaling link. A problem with the ISDN-PRI Signaling Link Port (D-channel) has an effect on all of the associated DS1 ISDN Trunks or PRI endpoint ports (B-channels) since no call control information can be conveyed to the far-end switch without it. Stable calls may remain operational, but no new calls can be made.

The ISDN-PRI Signaling Link Port itself depends on two other entities: the DS1/UDS1 Interface circuit pack it resides on, and the Processor Interface Link that provides the link to the processor. If there are problems with the ISDN-PRI Signaling Link Port, also investigate the DS1/UDS1 interface circuit pack and the Processor Interface Link.

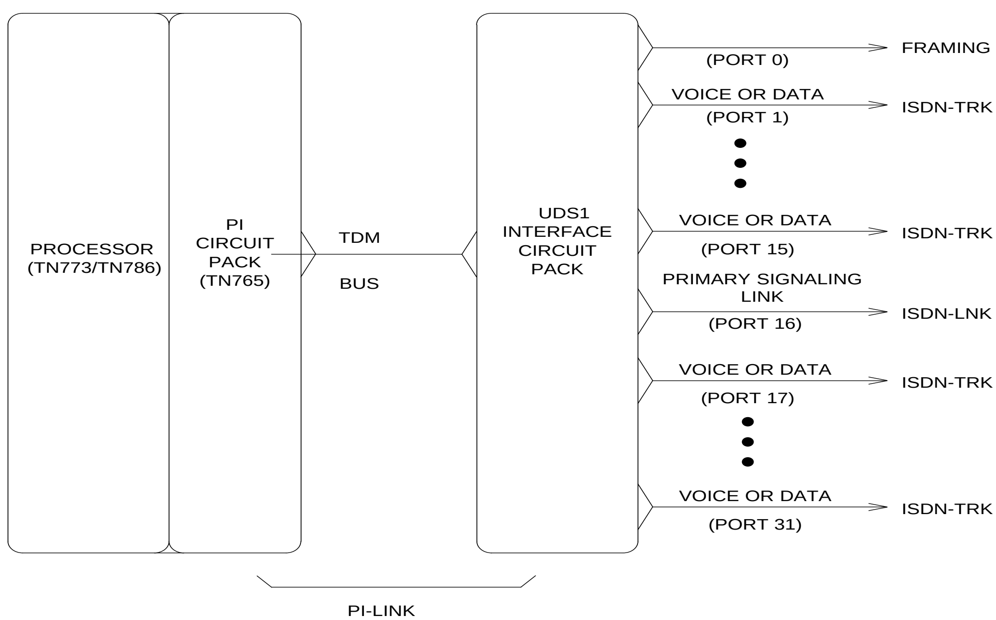

Figure 11-43. ISDN-PRI Signaling Link Port Interactions (32-Channel)

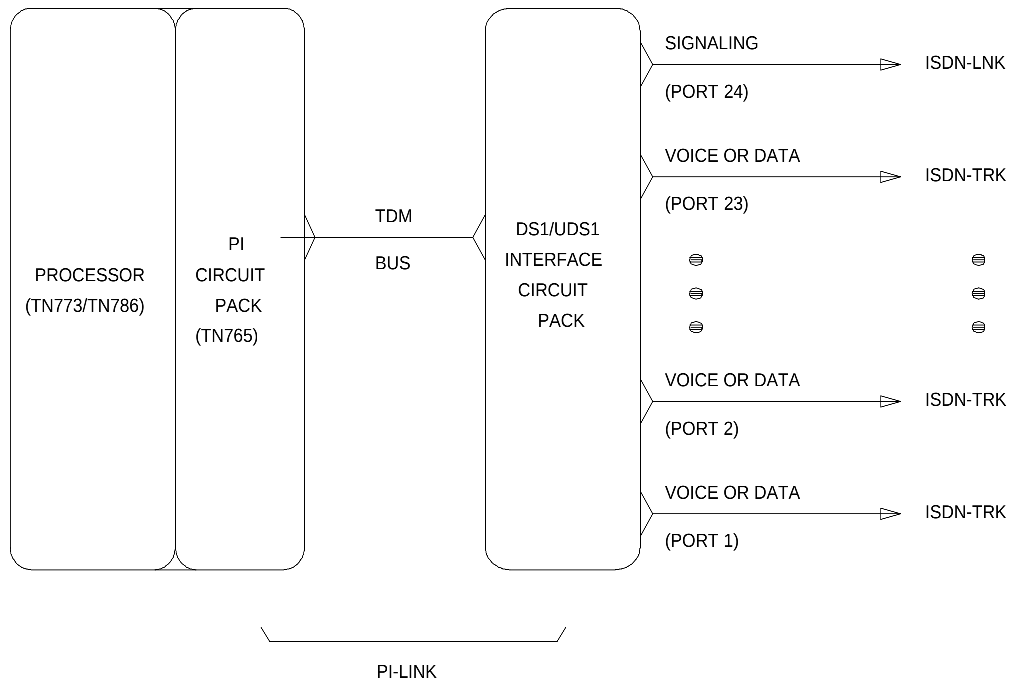

Figure 11-44. ISDN-PRI Signaling Link Port Interactions (24-Channel)

Hardware Error Log Entries and Test to Clear Values

Table 11-185. ISDN-PRI Signaling Link Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1 (c)
18	0	busyout port PCSSpp (c)	WARNING	OFF	release port PCSSpp (c)
130 (a)		None	WARNING	ON	test port PCSSpp sh (c)
1537 (b)		NPE Crosstalk Test #6	MINOR	ON	test port PCSSpp l r 3 (c)

1 Run the short test sequence first. If all tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

b. The actual alarming level depends on the options chosen via the **set options** command on the Manager terminal. ISDN-PRI Signaling Link Port alarms are treated as Station alarms, and their default alarming option is to downgrade all alarms to Warning. The value shown in the preceding table indicates the normal, unfiltered case (option "**y**" on the Set Options form).

c. ’pp’ is ’24’ for 24-channel interfaces, and ’16’ for 32-channel interfaces.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence. REMINDER: The command line entry to test the ISDN-LNK MO is: **test port PCSSxx (sh or l)**, where 'xx' is '24' for 24-channel interfaces, and '16' for 32-channel interfaces.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Signaling Link Board Check (#643)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete. This test runs only if the Processor Interface link corresponding to this ISDN-LNK MO is busied out by system technician. The Processor Interface link number can be determined from the Communication-Interface Links form.

Table 11-186. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources for this test are not available. The ISDN-PRI link may be up and servicing calls. First obtain the ISDN-PRI link number (lnk-no) from the Communication-Interface Links form by issuing the **display communication-interfaces links** command. Then, determine the status of the ISDN-PRI link via the **status link lnk-no** command. If the link is in-service, this test aborts. Therefore, to run this test, the link must be busied out. No new ISDN-PRI calls can be made while the link is in the busied-out state. 1. If the test must be run, busyout the link. 2. Retry the command. 3. If it continues to abort with Error Code 1000, escalate the problem.

Continued on next page

Table 11-186. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-186. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the DS1-BD Interface circuit pack.
	PASS	The port is able to communicate over the TDM Bus.

Signaling Link Board Check (#643)

This ISDN-PRI Signaling Link Port D-channel depends on the health of the DS1 Interface circuit pack. This test checks the state of the DS1 Interface circuit pack transporting the ISDN-PRI Signaling Link Port.

Table 11-187. TEST #643 Signaling Link Board Check

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this D-channel port is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete test on this port, either: 1. Re-attach the disconnected PRI terminal adapter and retry test command, or 2. Disable the rollabout video feature on this circuit pack by entering **change ds1 PCSS** and set the field **"Alarm when PRI Endpoint Detached?"** to **"y."**
8	FAIL	The DS1 circuit pack is not in-service. 1. Check the Hardware Error Log for entries logged against DS1-BD and consult the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation for repair procedures.
	PASS	The DS1 Interface circuit pack transporting the ISDN-PRI Signaling Link Port is in-service.

ISDN-PLK (ISDN-PRI Signaling Link Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ISDN-PLK[2]	MINOR	test port PCSSpp l	ISDN-PRI Signaling Link Port
ISDN-PLK	WARNING	test port PCSSpp sh	ISDN-PRI Signaling Link Port

1 Where 'pp' is '24' for 24-channel interfaces, and '16' for 32-channel interfaces.

2 For additional repair information, see also PKT-CTRL (Packet Control), DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (Universal DS1 Interface Circuit Pack) Maintenance documentation.

NOTE:
Use this Maintenance Object (ISDN-PLK) for maintenance tests , alarms, and hardware errors when the "ISDN-PRI over PACCON" option on the *system-parameters customer* form is set to a "**y**" When the ISDN PRI over PACCON is set to "**n**" use Maintenance Object ISDN-LNK.

The ISDN-PRI over PACCON option allows the PRI Links to be carried over the PACCON (Packet Controller TN778 circuit board), increasing the system ISDN-PRI capacity to the possible number of D-channels. An ISDN-PRI Signaling Link is known as a D-channel. The D-channel is used to transmit call-control signaling for the B-channels. B-channels (User information channels) are known as bearer channels (B-channels for example, transmit digitized voice, digital data); DS1 ISDN Trunks are B-channels and they carry the user traffic. PRI endpoint ports are also B-channels that can carry Wideband traffic. The call control signaling for the B-channels is combined and carried over the separate ISDN-PRI Signaling Link Port D-channel.

The ISDN-PRI Signaling Link Port is the port on a TN464C or later UDS1 Interface circuit pack that carries D-channel messages to the processor. The ISDN-PRI interface uses out-of-band signaling as opposed to robbed-bit, in-band signaling. For G3s, and G3i, this port can be used as an interface to the TDM bus or to the Packet bus. This is controlled by the "ISDN-PRI over PACCON" option. When the option is set to "**y**" the ISDN-PRI D-channel messages are transmitted over the Packet bus to the Packet Control circuit pack. The associated maintenance object name of the UDS1 port used to carry the D-channel over the Packet Bus is ISDN-PLK.

The B-channels associated with a ISDN-PRI D-channel can use ports on the same circuit pack or ports on other TN464C or later or TN767 DS1 Interface circuit packs (the TN722 cannot be used for this application).

The TN767 DS1 interfaces is used for 24 channel 1.544 Mbps systems. The TN464C or later can be used for either 24 or 32 channel systems. The 32-channel (31 DS0 channels + 1 framing channel on a 2.048 Mbps link) are only supported on TN464 series circuit packs. A description of these circuit packs appears in DS1-BD or UDS1-BD maintenance documentation.

In a 24 channel system, the DS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the first 23 ports. The ISDN-PRI Signaling Link Port must be the 24th port. In certain configurations (NFAS), the 24th port may be used as a B-channel. Refer to the ISDN-PRI Signaling Group (ISDN-SGR) Maintenance documentation for further details.

In a 32 channel system, the DS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the ports 1-15 or 17-31, but the ISDN-PRI Signaling Link Port must be the 16th port. In certain configurations (NFAS), the 16th port may be used as a B-channel. Refer to the ISDN-PRI Signaling Group (ISDN-SGR) Maintenance documentation for further details.

ISDN-PLK handles maintenance and recovery for the D-channel port on the DS1 carrying the signaling link. A problem with the ISDN-PRI Signaling Link Port (D-channel) has an effect on all of the associated DS1 ISDN Trunks or PRI endpoint ports (B-channels) since no call control information can be conveyed to the far-end switch or Terminal Adapter without it. Stable calls may remain operational, but no new calls can be made.

The ISDN-PRI Signaling Link Port (ISDN-PLK) itself depends on two other entities: the UDS1 interface circuit pack (TN464) it resides on, and the Packet bus which provides the link to the processor. If there are problems with the ISDN-PLK, also investigate the TN464 UDS1 interface circuit pack (UDS1-BD) and the packet bus (PKT-BUS).

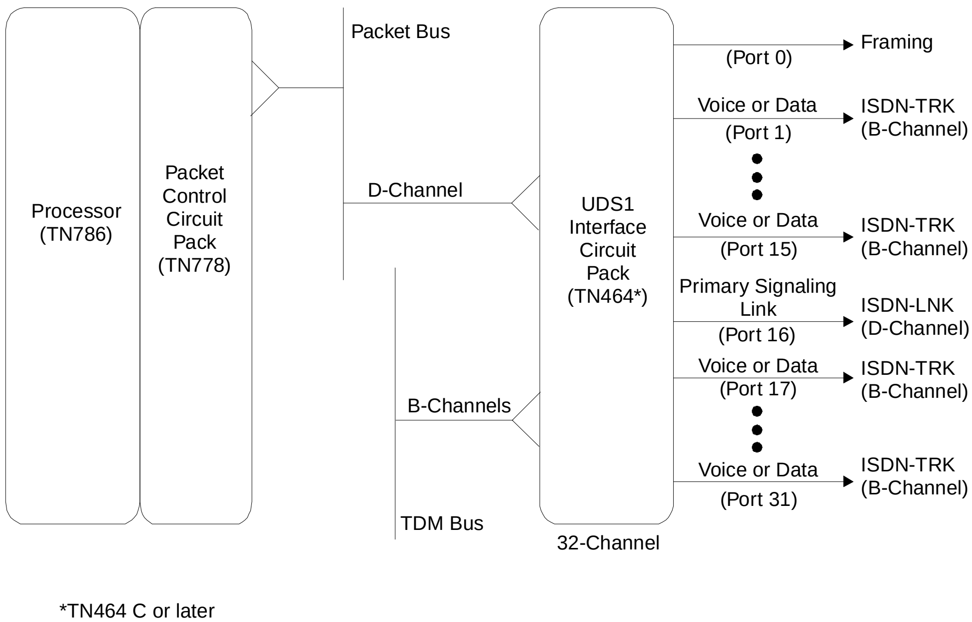

Figure 11-45. ISDN-PRI Signaling Link Port Interactions (32-Channel)

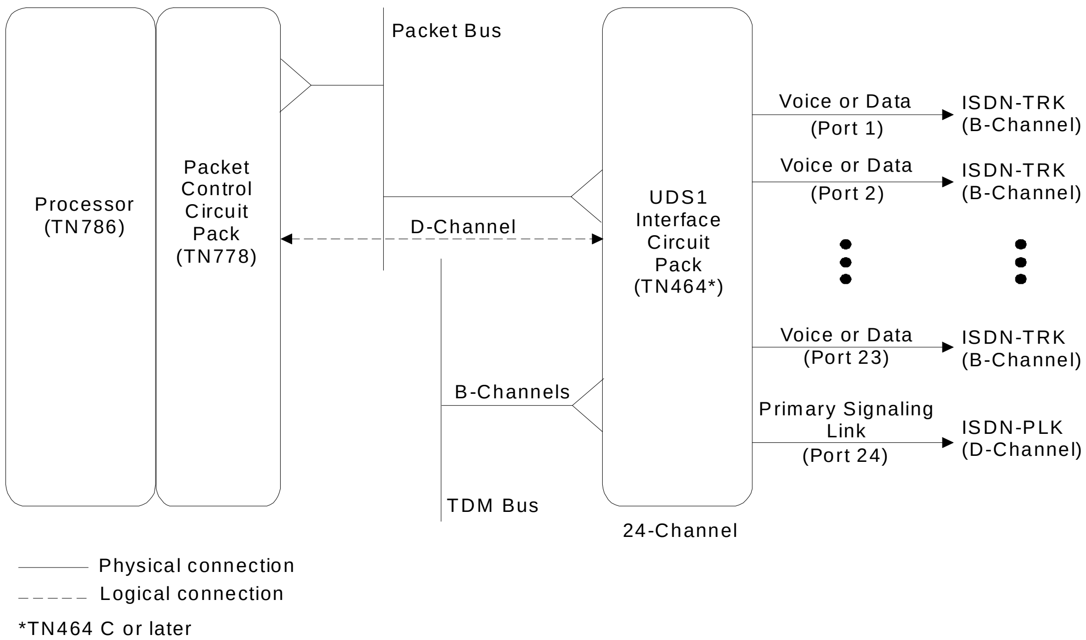

Figure 11-46. FAS ISDN-PRI Over PACCON Signaling Group (24 Channel)

Hardware Error Log Entries and Test to Clear Values

Table 11-188. ISDN-PRI Signaling Link Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp[2]
18(a)	0	busyout port PCSSpp*	WARNING	OFF	release port PCSSpp[2]
130 (b)		None	WARNING	ON	test port PCSSpp[2]
1537 (c)	46210		WARNING	OFF	
1793 (d)					test board PCSSpp[2]1
3585 (e)	46222		MINOR	ON	
3841 (f)	46211				
3842 (g)	46223				
3843 (h)		Signaling Port Packet Bus (LAN) Loopback test (#939)			test port PCSSpp[2]1

1 Run the short test sequence first. If all tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

2 pp is 24-channel interfaces and 16 for 32-channel interfaces.

Notes:

a. The D-channel is demand busied out. No calls can be made over this D-channel.

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. “Link error” This error occurs when the port receives an invalid frame over the D-channel. This error normally indicates an off-board problem usually related to transmission errors on the DS1 facility. Execute the **list measurements ds1-log** command for the UDS1 TN464 circuit pack on which the D-channel resides. If the UDS1 is reporting some errors, then the DS1 facility has experienced transmission problems which could have caused the ISDN-PLK to report a Link Error. If the UDS1 is not reporting errors, execute the long test sequence for the D-channel (ISDN-SGR). Investigate any errors, if there are none execute a long test sequence for the UDS1 circuit pack (UDS1-BD) and investigate any errors.

If this Link Error continues to be logged, follow normal escalation procedures. If no errors are reported, the Link Error is probably not affecting service.

d. The UDS1 Interface circuit pack is out-of-service. Look for and resolve UDS1-BD errors in the Hardware Error Log.

e. "Transmit FIFO Overflow error" This error indicates that the circuit pack is having problems transmitting data to the Packet Bus, thus affecting the conveyance of signaling information over the D-channel. Specifically, this error occurs when the Packet Bus transmit buffers overflow. This condition probably indicates a hardware problem.

   The actual alarming level depends on the options chosen via the **set options** command on the G3-MT terminal. ISDN-PRI Signaling Link Port alarms are treated as Station alarms, and their default alarming option is to downgrade all alarms to Warning. The value shown in the preceding table indicates the normal, unfiltered case (option "y" on the *Set Options* form).

f. "Bad DLCI error" This error occurs when a LAPD frame is received across the DS1 facility which contains a DLCI which does not have a valid entry in the on-board translation memory. This error normally indicates an off-board problem usually related to a broken endpoint or a state mismatch between a remote endpoint and the local call processing software. Maintenance will not start any testing or generate any alarms in response to this error.

g. "Receive FIFO Overflow error" This error occurs when the circuit pack detects an overflow of its receive buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch between the two end-points of a packet switched connection. LAPD should be able to recover from this problem, but it may degrade the performance of the Packet Bus. Maintenance will not start any testing or generate any alarms in response to this error.

h. This error occurs when the *Signaling Port Packet Bus Loopback Test (#939)* fails. Run the long test sequence and pay particular attention to the results of *Test #939*.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. REMINDER: The command line entry to test the ISDN-PLK MO is: **test port PCSSpp (sh or l)**, where 'pp' is '24' for 24-channel interfaces, and '16' for 32-channel interfaces.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Port Bus Loopback Test (#939)		X	D
Signaling Link Board Check (#643)	X	X	ND

1 D = Destructive; ND = Nondestructive

Signaling Link Board Check (#643)

This test checks the state of the UDS1 Interface circuit pack (TN464C or later) transporting the ISDN-PRI Signaling Link.

Table 11-189. TEST #643 Signaling Link Board Check

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this D-channel port is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete test on this port, either: 1. Re-attach the disconnected PRI terminal adapter and retry test command, or 2. Disable the rollabout video feature on this circuit pack by entering **change ds1 PCCSS** and set the field **"Alarm when PRI Endpoint Detached?"** to **"y."**
8	FAIL	The UDS1 circuit pack (TN464C or later) is not in-service. 1. Check the Hardware Error Log for entries logged against UDS1-BD and consult the UDS1-BD (UDS1 Interface Circuit Pack) Maintenance documentation for repair procedures.
	PASS	The UDS1 Interface circuit pack transporting the ISDN-PRI Signaling Link Port is in-service.

Signaling Port Packet Bus Loopback Test (#939)

This test verifies the connectivity of an ISDN-PRI Signaling Port (D-channel) across the Packet Bus, also known as the LAN bus. It will execute only if the port is busied out. Failure of this test indicates a fault associated with the port hardware on the circuit pack..

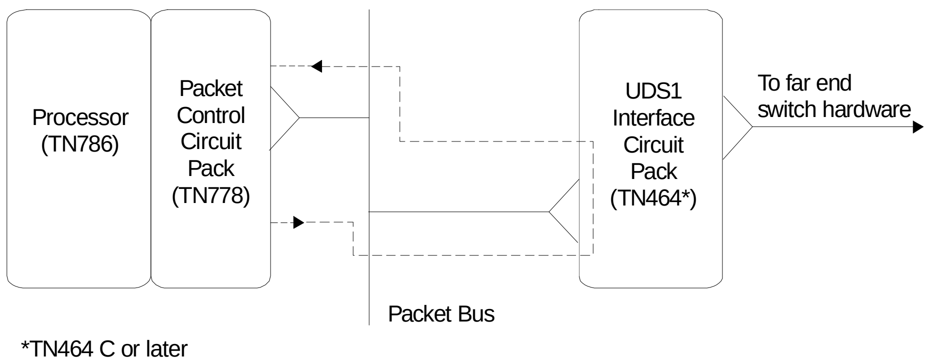

Figure 11-47. Signaling Port Packet Bus (LAN) Loopback

Table 11-190. TEST #939 Signaling Port Packet Bus Loopback

Error Code	Test Result	Description/ Recommendation
1015	ABORT	The port is not in the out-of-service state. Use the **busyout port PCSSpp** command to place it in the out-of-service state and repeat this test **CAUTION:** *The **busyout** will prevent new call originations on all B-channels in the signaling group until the port is released.*
1139	ABORT	The Packet Bus in this port network is out of service. 1. Follow repair procedures for the Packet Bus 2. Enter **test port PCSSpp long** and check the results of this test (939).

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Table 11-190. TEST #939 Signaling Port Packet Bus Loopback — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The Packet Control circuit pack is out of service. 1. Follow the repair procedures for PKT-CTRL. 2. Enter **test port PCSSpp long** and check the results of this test (939).
1144	ABORT	The Packet Bus in the PPN is out of service. 1. Follow the repair procedures for the Packet Bus. 2. Enter **test port PCSSpp long** and check the results of this test (939).
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test 1. Retry the command at one-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Loopback test has failed. 1. If this test fails repeatedly wait until all of the ports on the board are idle (not in use) and reset the circuit pack. To reset the circuit pack enter the commands **busyout board PCSS** and **reset PCSS**. 2. Repeat the test, and if the test continues to fail replace the circuit pack.
	PASS	1. Connectivity of the D-channel over the Packet Bus is operational.

Continued on next page

ISDN-SGR (ISDN-PRI Signaling Group)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
ISDN-SGR	MINOR	test sig-group <group>	ISDN-PRI Signaling Group
ISDN-SGR	WARNING	test sig-group <group>	ISDN-PRI Signaling Group

1 Where <group> is a number 1-8 and the test sequence can be either s (short) or l (long).

An ISDN-PRI Signaling Group is a collection of DS1/UDS1 ISDN Trunks or PRI endpoint ports (B-channels) for which a given ISDN-PRI Signaling Link Port (D-channel) carries signaling information. ISDN-PRI requires the use of one of the following DS1 interface circuit packs:

TN767	24-channel with ISDN-PRI D-channel over PI-BD
TN464B	32-channel with ISDN-PRI D-channel over PI-BD
TN464C or later	24- or 32-channel with ISDN-PRI D-channel over PI-BD or PKT-CTRL (PACCON)

See DS1-BD and UDS1-BD Maintenance documentation for a description of these circuit packs. See *DS1/CEPT1/ISDN-PRI Reference*, 55-025-101, for more information on ISDN.

NOTE:
If a ISDN-PRI over PACCON (Packet Control Circuit pack) is to be used then only the TN464C or later may be used for the D-channel Signaling.

For 24 channel interfaces, the first 23 ports on the circuit pack are used as B-channels. The 24th port may be used as a B-channel or as a D-channel depending on the type of Signaling Group used, as described below.

For 32 channel interfaces, ports 1-15 and 17-31 on the circuit pack are used as B-channels. The 16th port may be used as a B-channel or as a D-channel depending on the type of Signaling Group used, as described below.

There are two types of Signaling Groups:

- Facility Associated Signaling (FAS) (supported by all country protocols)
- Non-Facility Associated Signaling (NFAS) (supported by country protocol 1 only)

The figures following this discussion illustrate each of the configurations.

In an FAS Signaling Group, the 24th port of the DS1 Interface circuit pack (for 24 channel interfaces) or the 16th port of the DS1 Interface circuit pack (for 32 channel interfaces) is always the D-channel that carries signaling information for the other ports (B-channels) on the circuit pack. If a Packet Control circuit pack is used then only the TN464C or later circuit pack may be used.

In an NFAS Signaling Group, the 24th port of a DS1 Interface circuit pack (for 24 channel interfaces) or the 16th port of a DS1 Interface circuit pack (for 32 channel interfaces) is administered as a D-channel. The D-channel carries signaling information for the other ports (B-channels) on that circuit pack. That D-channel can also carry signaling information for any of the ports on other DS1 Interface circuit packs in the NFAS Signaling Group. As a result, the 24th port on other 24-channel DS1 Interface circuit packs and the 16th port on other 32-channel DS1 Interface circuit packs can be used as B-channels. A D-channel in an NFAS Group can signal for B-channels on a total of 20 DS1 Interface circuit packs. This configuration is known as NFAS Simplex. If a Packet Control circuit pack is used then only the TN464C or later circuit pack may be used to carry the D-channel, however other DS1/UDS1 interface circuit packs may be used to carry only B-channels.

In addition to NFAS Simplex, there is another type of NFAS Group called NFAS Duplex. This provides the user with more reliability, which is desirable because NFAS permits the D-channel to signal for so many B-channels. NFAS Duplex allows the administration of a backup D-channel, which remains in a Standby state until the Active D-channel goes down. If the Active D-channel does go down, the backup D-channel takes over and provides signaling for all the B-channels in the signaling group. In the case that a Packet Control circuit pack is used then only the TN464C or later may be used to carry the D-channels. B-channels may be carried by any DS1/UDS1 interfaces.

The ISDN-PRI Signaling Group itself depends on three other entities: the DS1 Interface circuit pack on which the D-channel(s) resides, the ISDN-PRI Signaling Link Port(s), and the interface link that provides connectivity to the processor (either the Processor Interface Link or the Packet Control circuit pack). If there are any problems with the ISDN-PRI Signaling Group, also investigate the ISDN-PRI Signaling Link Port(s), the DS1 Interface circuit pack(s), and either the Processor Interface Link or the Packet Control circuit pack.

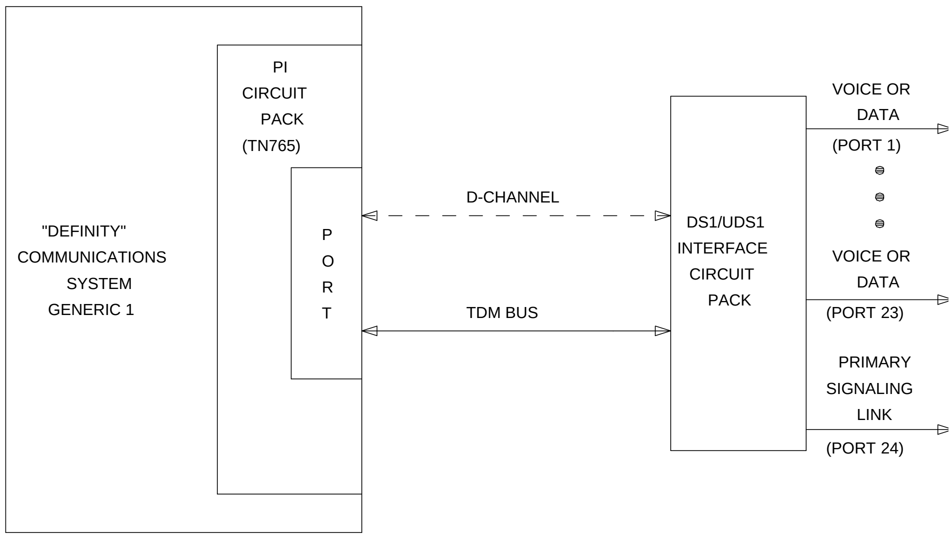

Figure 11-48. FAS ISDN-PRI Signaling Group (24 Channe)l over Processor Interface

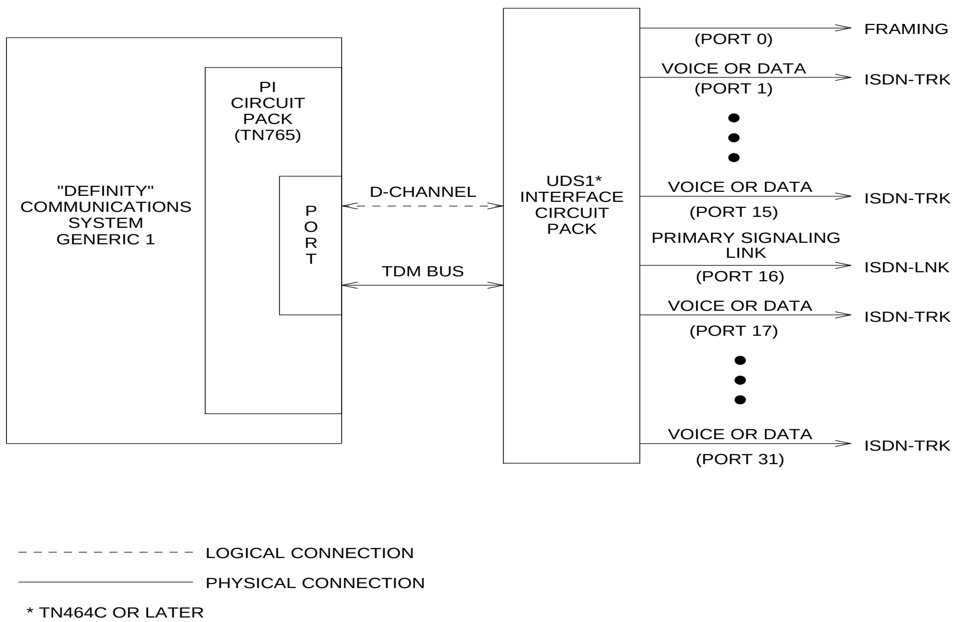

Figure 11-49. FAS ISDN-PRI Signaling Group (32 Channe)l over Processor Interface

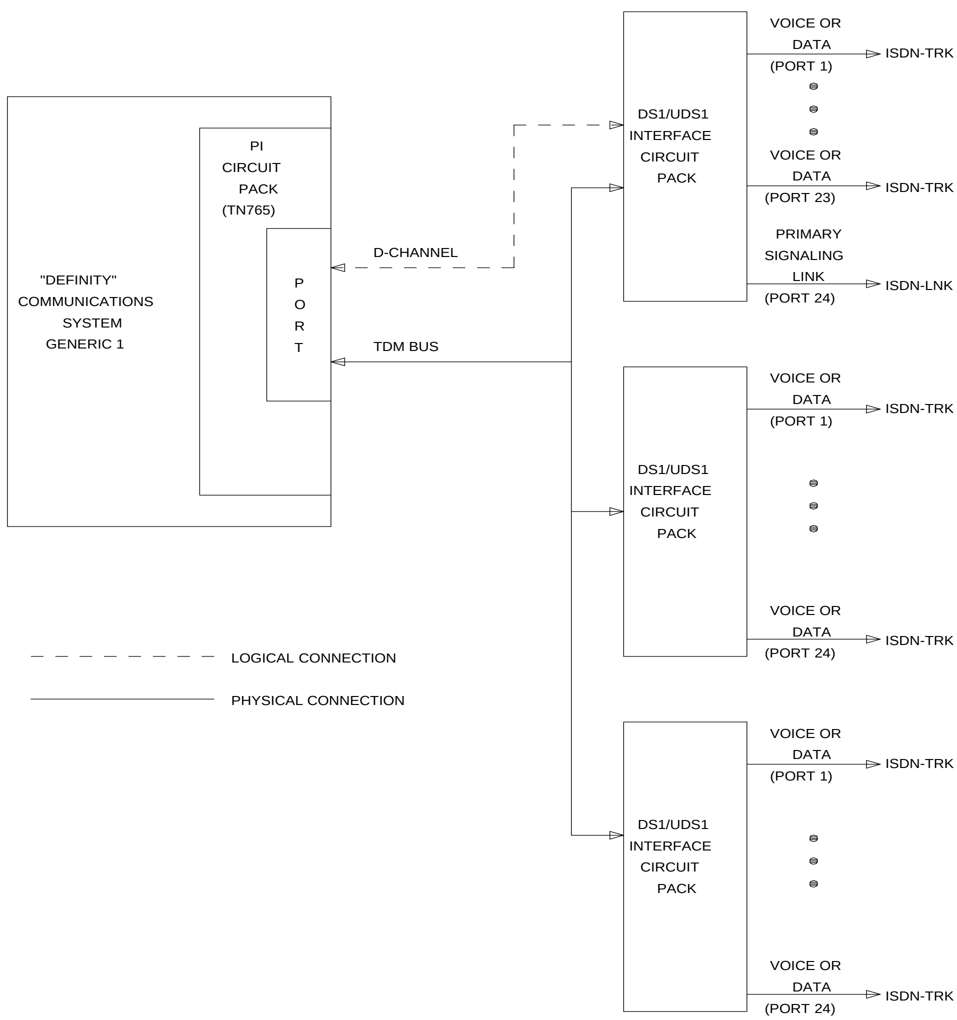

Figure 11-50. NFAS Simplex ISDN-PRI Signaling Group (24 Channel) over Processor Interface

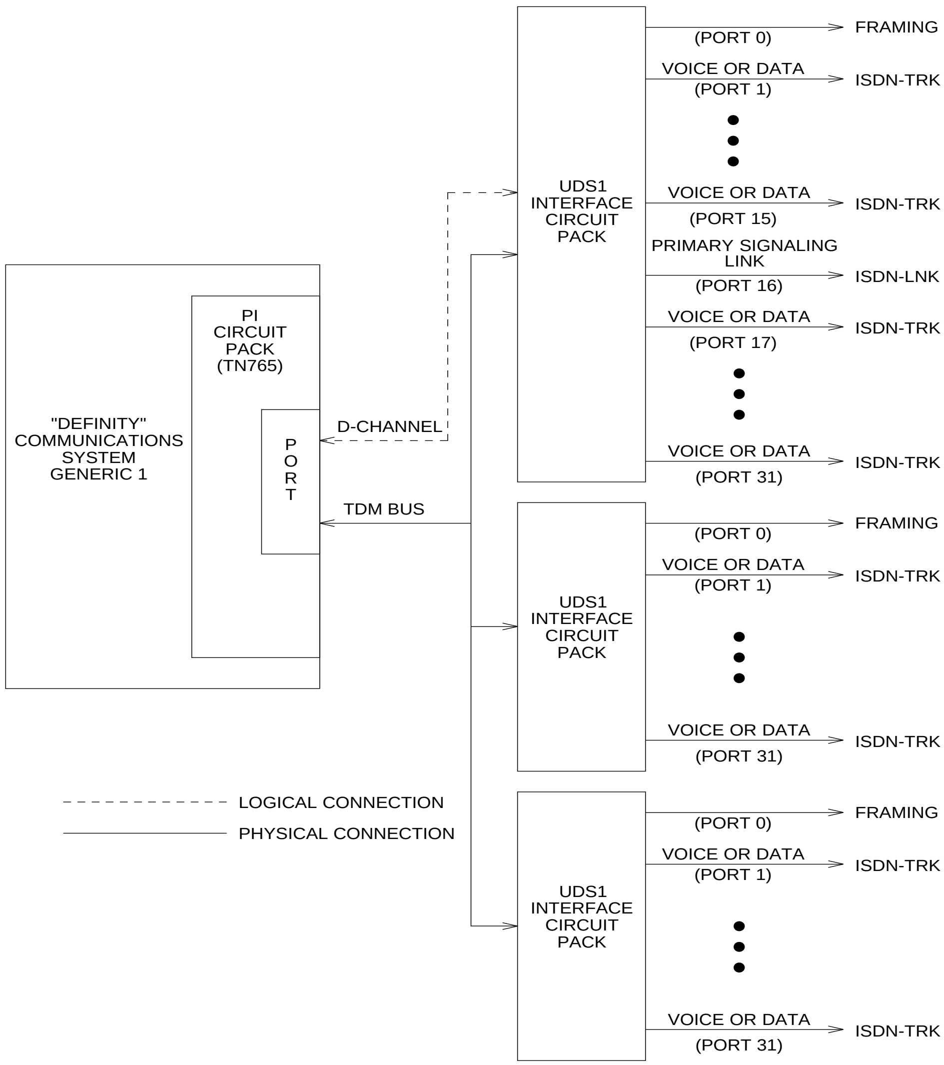

Figure 11-51. NFAS Simplex ISDN-PRI Signaling Group (32 Channel) over Processor Interface

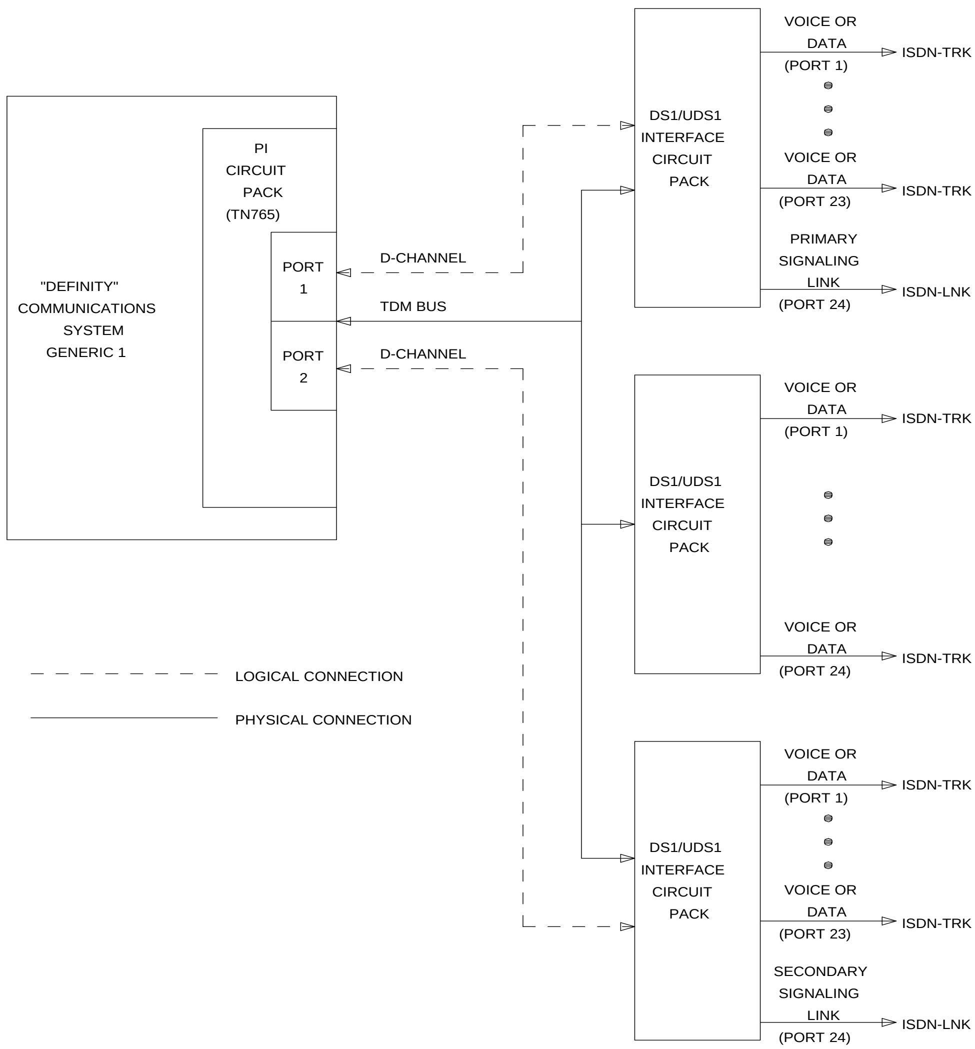

Figure 11-52. NFAS Duplex ISDN-PRI Signaling Group (24 Channel) over Processor Interface

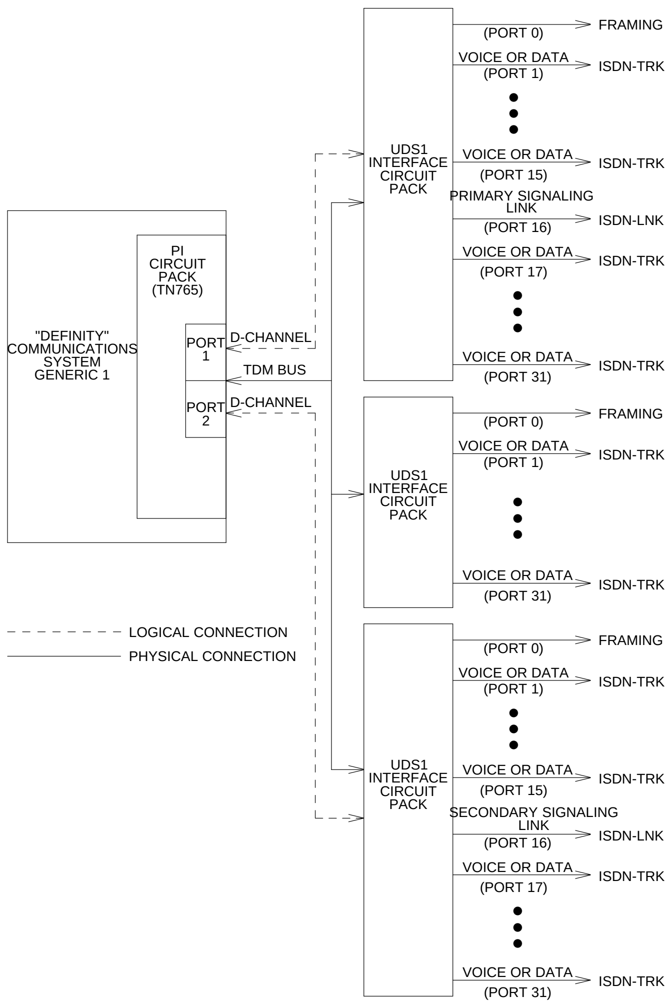

Figure 11-53. NFAS Duplex ISDN-PRI Signaling Group (32 Channel) over Processor Interface

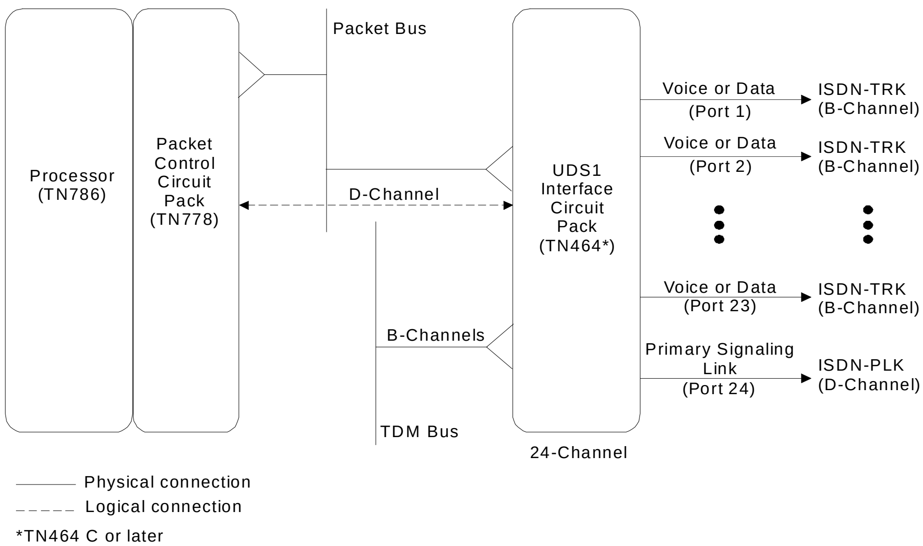

Figure 11-54. FAS ISDN-PRI Over PACCON Signaling Group (24 Channel)

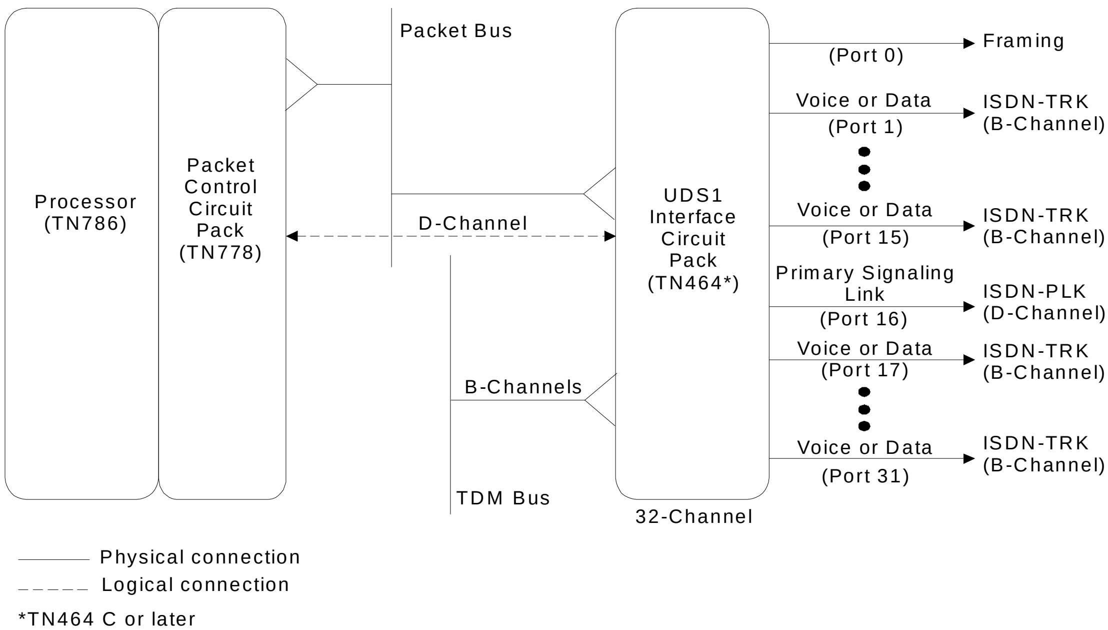

Figure 11-55. FAS ISDN-PRI Over PACCON Signaling Group (32 Channel)

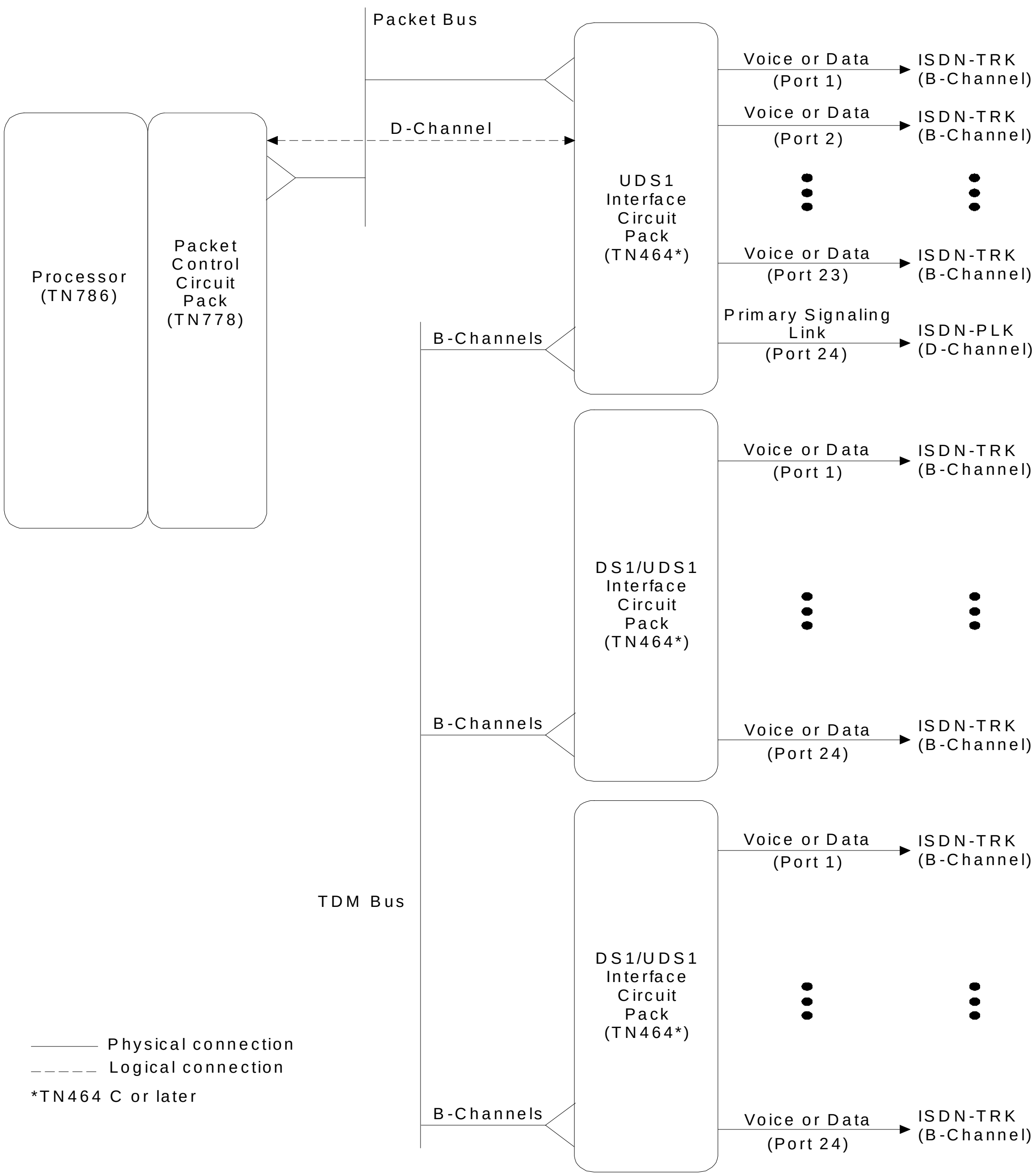

Figure 11-56. NFAS Simplex ISDN-PRI Over PACCON Signaling Group (24 Channel)

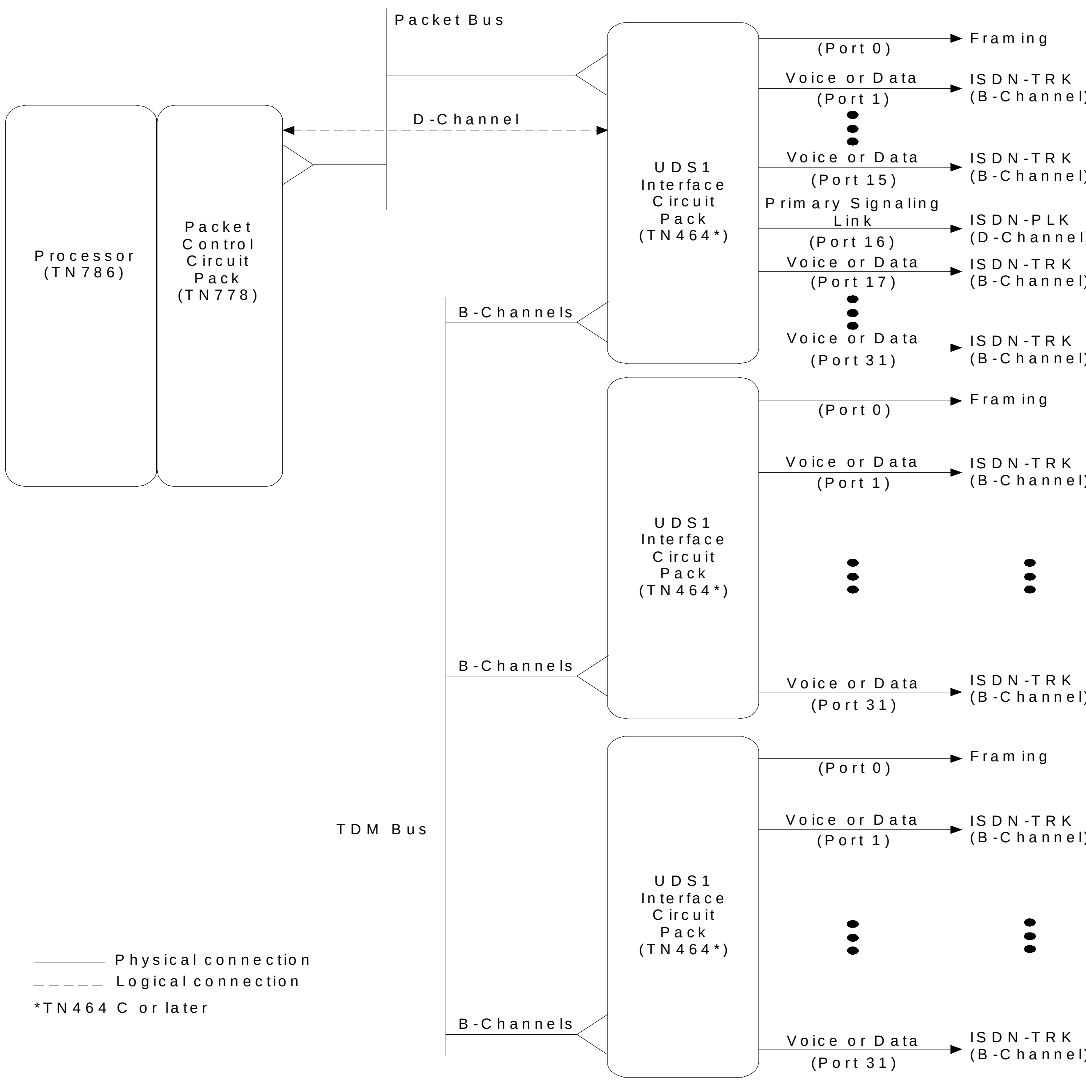

Figure 11-57. NFAS Simplex ISDN-PRI Over PACCON Signaling Group (32 Channel)

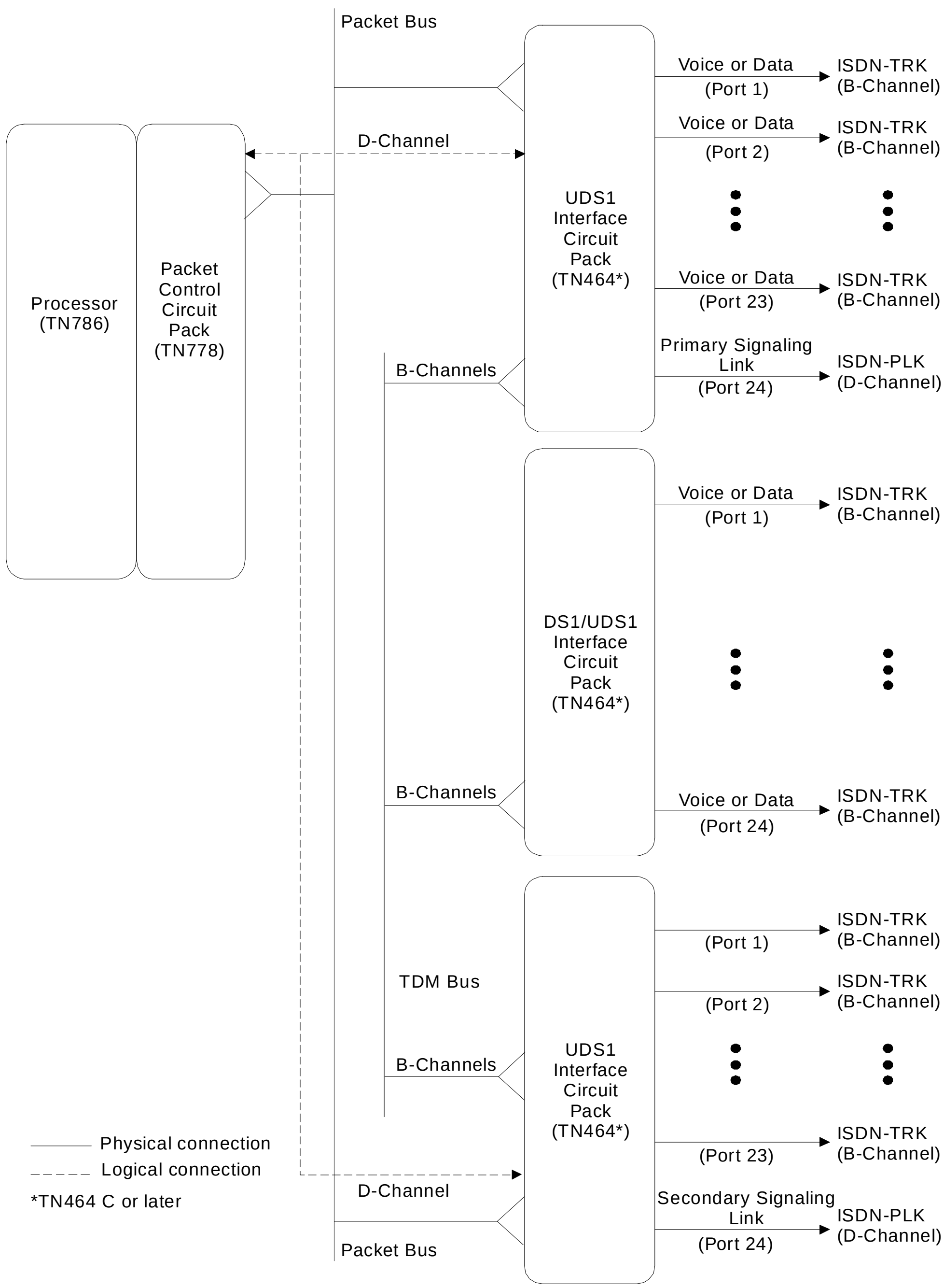

Figure 11-58. NFAS Duplex ISDN-PRI Over PACCON Signaling Group (24 Channel)

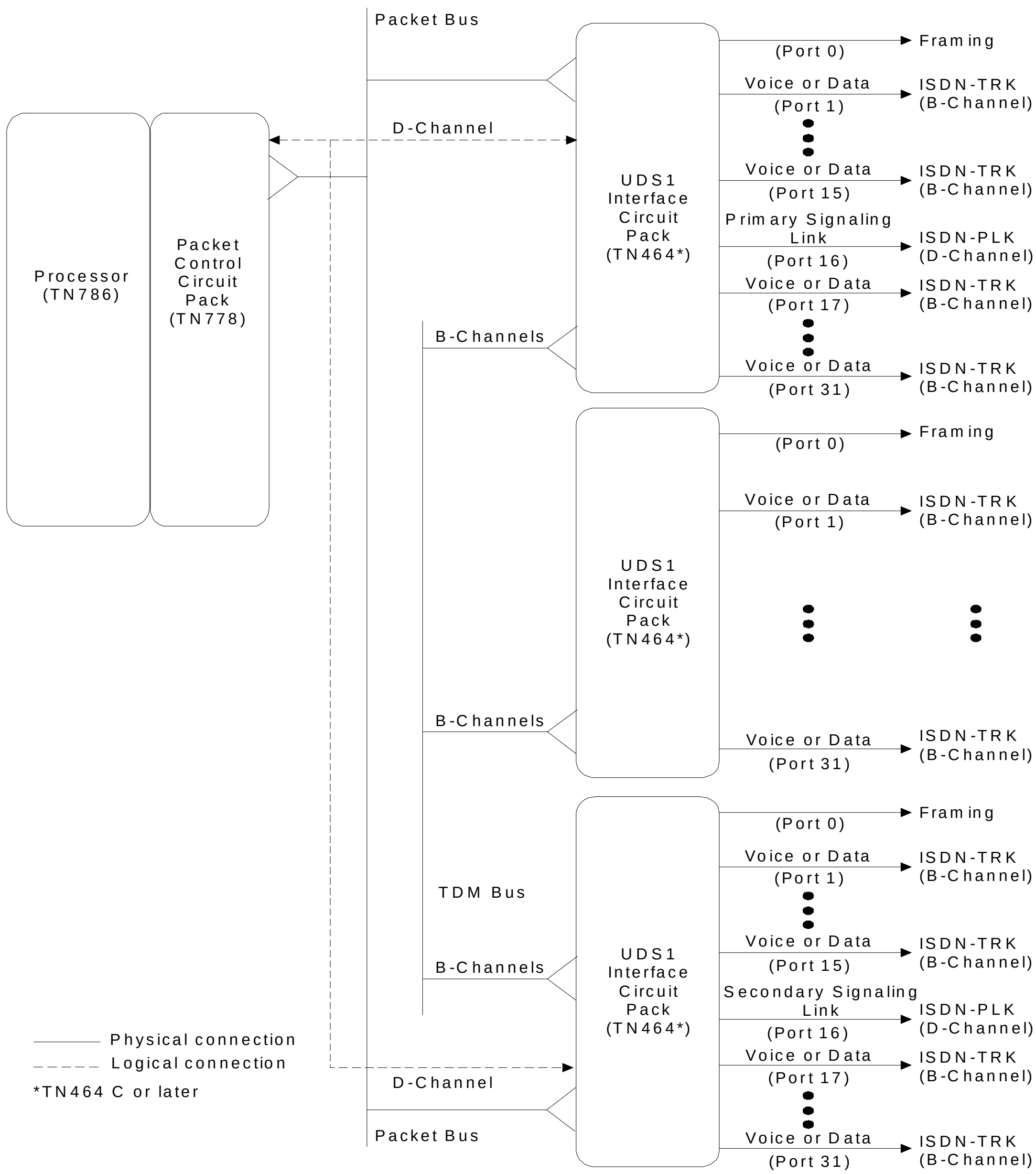

Figure 11-59. NFAS Duplex ISDN-PRI Over PACCON Signaling Group (32 Channel)

Hardware Error Log Entries and Test to Clear Values

Table 11-191. ISDN-PRI Signaling Group Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any		test sig-group <group>
1 (a)	Any	none			
257 (b)	Any	none			test sig-group <group>
513 (c)	Any	none			test sig-group <group>
769	Any	Primary Signaling Link Hardware Check (#636)			test sig-group <group>
1025	Any	Secondary Signaling Link Hardware Check (#639)			test sig-group <group>
1793 (d)	Any	Layer 2 Status (Test #647)	WARNING	OFF	test sig-group <group>
2049 (e)	Any	Layer 2 Status (Test #647)	WARNING	OFF	test sig-group <group>
2305 (f)	Any	Remote Layer 3 Query (Test #637)	MINOR	OFF	test sig-group <group>
3585 (g)	port number	none			none
3840-3928 (h)	port number				none

1 Run the Short or Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This switch sent a message to the far-end switch or terminal adapter, and the far-end did not respond in the allotted time. Possible causes include link failure and congestion or outage at the far-end. The Aux Data field contains Layer 3 protocol information used by internal counters.

If no other symptoms are not present, no action is required. If Layer 3 communication is down, there should be indications in the form of alarms and errors for link components. Check out other errors against ISDN-SGR, ISDN-TRK, and other hardware components on the link.

There is no test to clear these errors. The error counter is decremented by 1 every 15 minutes.

b. This error indicates that the primary signaling channel connection has been lost for more than 90 seconds. If a secondary signaling channel does not exist or is not in-service, the associated B-channels will be placed in the ISDN Maintenance/Far-End state. The B-channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Pay particular attention to the results of Test #636 (Primary Signaling Link Hardware Check) in the test sequence. When the link does recover, the B-channels will be negotiated back to the In-Service state and their alarms will be retired.

   When this error occurs, the state of the Signaling Group is changed to out-of-service (verify using the **status sig-group** command).

c. This error indicates that the secondary signaling channel connection has been lost for more than 90 seconds. If the primary signaling channel is not in-service, B-channels will be placed in the ISDN Maintenance/Far-End state. The B-channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Pay particular attention to the results of Test #639 (Secondary Signaling Link Hardware Check) in the test sequence. When the link does recover, the B-channels will be negotiated back to the In-Service state and their alarms will be retired.

   When this error occurs, the state of the Signaling Group is changed to out-of-service (verify using the **status sig-group** command).

d. This error indicates a failure of the Layer 2 Status Query Test for the primary signaling channel

e. This error indicates a failure of the Layer 2 Status Query Test for the secondary signaling channel.

f. A specific message was sent to the far-end switch, and it did not respond within the allotted time. Investigate elements of the ISDN PRI D-channel(s) (ISDN-LNK, ISDN-PLK, ISDN-SGRP, PI-LINK, PI-PT, PKT-CTRL) for both this switch and the Far-end switch. If Test #637 fails twice in a row, the B-channels will be alarmed and made unavailable for outgoing calls (although incoming calls will still be accepted). When Test #637 succeeds and the Far-end switch starts responding properly, the DS1 ISDN Trunk (B-channels) will be placed back into normal operation and their alarms will be retired.

g. A SERV or SERV ACK ISDN D-channel message has been received by a non-US-type interface (country option other than 1 on the DS1 administration form). However, these messages are used only for duplex NFAS signaling which is supported only by country protocol 1.

   Thus, there may be a mismatch in administration between the local and far-end switches. Consult with the customer's network provider to determine whether the D-channel is set up correctly on the far-end switch.

h. These error types are used to report certain error messages received by the ISDN-PRI Signaling Group for one of its associated B-channels. The aux data field shows for which B-channel (port number) the message was received.

   The error code generated equals 3840+*x*, where *x* is a Cause Value defined by the ISDN PRI Specification. Note that there is no Test to Clear Value for these error types; selected ISDN cause values are placed in the log when they are received, but no direct action or alarming is performed solely in response to receiving them. They provide added data that may prove useful when tracking down obscure networking and routing problems. The following table provides more information:

Table 11-192. Descriptions and Recommendations for Error Types 3840-3928

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cannot be accessed.	1. From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Check all routing patterns containing this trunk group for validity of interexchange carriers requested (IXC field).
3846	The far-end switch has indicated that the B-channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate an administration problem (for example, the local switch and the far-end switch have different B-channels administered), or could reflect the occurrence of a normal race condition (for example, the local switch has requested use of a B-channel which the far-end switch had just reserved for use on another call). 1. From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Issue the **status trunk** command for the indicated trunk. 3) Refer to the ‘‘DS1 ISDN Trunk Service States’’ and ‘‘ISDN-PRI Trunk Service States’’ sections of ISDN-TRK for recovery suggestions.
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch or terminal adapter which did not respond in the allotted time.	Follow same recommendations as for Error Type 1.

Continued on next page

Table 11-192. Descriptions and Recommendations for Error Types 3840-3928 — *Continued*

Error Code	Description	Recommendation
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	1. From the circuit pack and port number (in the Aux Data field, determine the trunk group against which the error was reported. 2. Consult with the network provider to determine the nature and expected duration of the out of service condition. 3. Consider modifying all routing patterns containing this trunk group, to route calls around the network which is out of service.
3890	A request to use a network service (e.g., SDN) has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. 1. From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Display the trunk group form: If the trunk group is Call-by-Call (Service Type is ‘‘cbc’’), check all routing pattern forms containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.

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Table 11-192. Descriptions and Recommendations for Error Types 3840-3928 — *Continued*

Error Code	Description	Recommendation
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	First, eliminate any transitory state mismatch problems by issuing the **test port UUCSSpp** command for the trunk port shown in the aux data field. Test #256 (Service State Audit) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.

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Table 11-192. Descriptions and Recommendations for Error Types 3840-3928 — *Continued*

Error Code	Description	Recommendation
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the recommendations listed above for error type 3890.
3928	A call was denied because of a basic incompatibility between the type of call and either the facilities selected by the routing pattern or the called user itself.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks or PRI endpoints. Determine the trunk group from the circuit pack and port number (in the aux data field) and then check the BCC fields of the pertinent routing patterns. Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Primary Signaling Link Hardware Check*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Primary Signaling Link Hardware Check (#636)	X	X	ND
Secondary Signaling Link Hardware Check (#639)	X	X	ND
Layer 2 Query Test (#647)	X	X	ND
Remote Layer 3 Query Test (#637)	X	X	ND

1 D = Destructive; ND = Nondestructive

Primary Signaling Link Hardware Check (#636)

The ISDN-PRI Signaling Link Port itself depends on the health of the DS1/UDS1 Interface circuit pack on which it resides. This test will fail if there are problems with either the ISDN-PRI Primary D-channel port or the DS1/UDS1 circuit pack. The ISDN-PRI Primary D-channel also depends on the health of either the Processor Interface Link or the Processor Control circuit pack providing connectivity to the DS1/UDS1 circuit pack.

If there are problems with the ISDN-PRI Signaling Link, also investigate the DS1/UDS1 circuit pack (DS1-BD/UDS1-BD) and the Processor Interface Link or Packet Control (PI-LINK/PACCON) dependant upon which is used

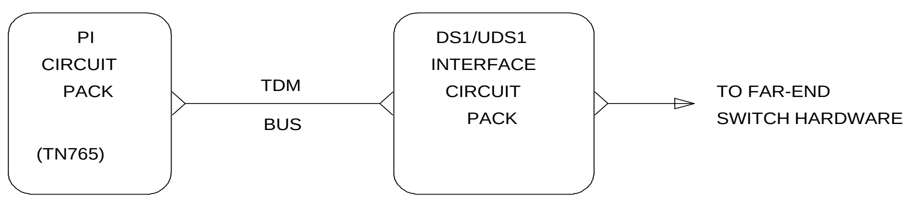

Figure 11-60. Primary Signaling Link Hardware Check (Test #636)

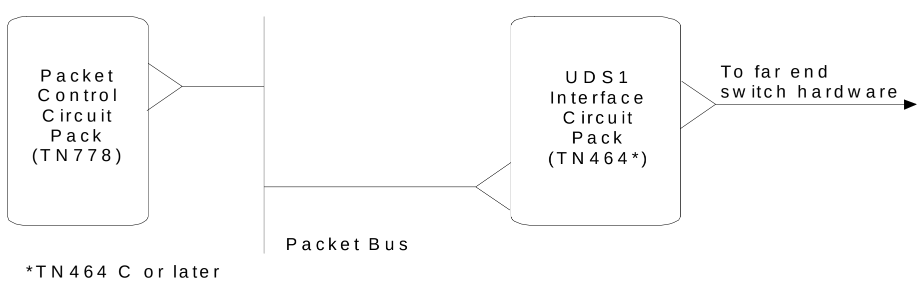

Figure 11-61. PRI over PACCON Primary Signaling Link Hardware Check (Test #636)

Table 11-193. TEST #636 Primary Signaling Link Hardware Check

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this D-channel port is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete test on this port, either: 1. Re-attach the disconnected PRI terminal adapter and retry test command, or 2. Disable the rollabout video feature on this circuit pack by entering **change ds1 UUCSS** and set the field **"Alarm when PRI Endpoint Detached?"** to **"y"**.
4	FAIL	There is a problem with the Processor Interface Link. No DS1 ISDN Trunk (B-channel) or wideband PRI Endpoint calls can be made until the problem is resolved. 1. Display the Communication-Interface Links Form via the to determine which link is down (find the one that matches the DS1 interface circuit pack this ISDN-PRI Signaling Link Port is on) and then consult the procedures for Processor Interface Link.
8	FAIL	There is a problem with the DS1/UDS1 Circuit Pack, or the ISDN-PRI Signaling Channel (D-channel). No DS1 ISDN Trunk (B-channel) or wideband PRI Endpoint calls can be made until the problem is resolved. 1. Consult the procedures for DS1/UDS1 Circuit Pack and the ISDN-PRI Signaling Channel (ISDN-LNK/ISDN-PLK).
	PASS	The basic physical connectivity of the primary D-channel is intact and functional. One might try this test repeatedly to ensure the link is up and to uncover any transitory problems.

Remote Layer 3 Query (#637)

This test will query the far-end switch or terminal adapter to determine if the signaling connection is functioning properly at Layer 3. It will select a B-channel in the in-service or maintenance service state and send an ISDN Layer 3 SERVice message, which requires a response from the far end (similar to performing Test #256 on an ISDN trunk. The test will not be performed if there are no B-channels in an appropriate ISDN service state (as when none are administered or they are all out of service).

> **NOTE:**
> The service state can be displayed by using the **status trunk <trunk group/trunk member>** or **status pri-endpoint** command.

As is the case with Test #256 for an ISDN trunk, a PASS only indicates that a message was composed and sent to the far-end switch or terminal adapter. The ISDN PRI Specification allows up to 2 minutes for a response. Check the Error Log for ISDN-SGR (ISDN-PRI Signaling Group) errors of type 2305 for evidence of a Remote Layer 3 Query failure.

Tests #639 and #636 check the health of the D-channels and DS1/UDS1 Interface Circuit Packs. As shown in the figures below, Test #637 goes one step further by checking the communication path from the processor, through the Processor Interface or Packet Control circuit pack over the TDM or Packet Bus through the DS1/UDS1 Interface circuit pack, and on to the far-end switch or terminal adapter. A special ISDN message is sent to the far-end switch or terminal adapter, which must respond within a specified amount of time. This test is designed to ensure that the communication path between the switch and the far-end is up and operational, and that the two endpoints can properly exchange ISDN control messages.

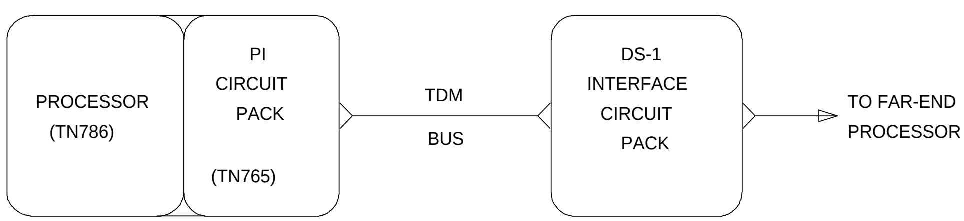

Figure 11-62. Remote Layer 3 Query (Test #637)

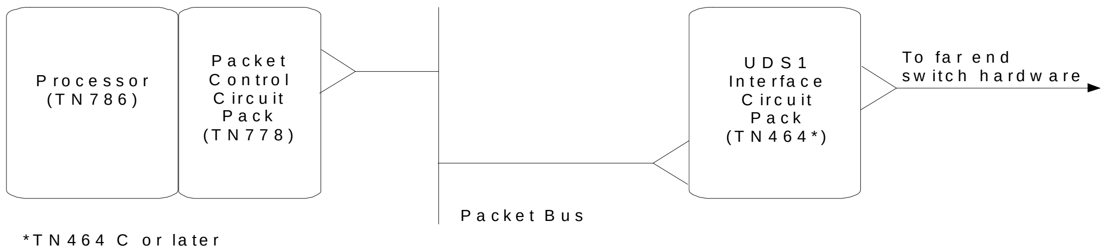

Figure 11-63. PRI Over PACON Remote Layer 3 Query (Test #637)

Table 11-194. TEST #637 Remote Layer 3 Query

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.
1006	ABORT	This is a NORMAL ABORT. For country protocol 1 interfaces (including the USA), either there are no B-channels administered in this signaling group, or all B-channels in this signaling group are either out-of-service or are in a "pending" state (PINS or PMTC, indicating that a B-channel maintenance message for that B-channel has been sent and not yet acknowledged). 1. Administer an ISDN Trunk or PRI Endpoint Port (B-channel) in this signaling group, or use the **status trunk TRK-GRP/TRK** or **status pri-endpoint <extension>** command to check the state of the ISDN Trunks or PRI Endpoint Ports associated with this signaling group. Refer to ISDN-TRK or PE-BCHL for further details regarding service state definitions and transitions. For systems not using country protocol 1 interfaces, there are no B-channels administered in this signaling group.

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Table 11-194. TEST #637 Remote Layer 3 Query — *Continued*

Error Code	Test Result	Description/ Recommendation
1019	ABORT	There is already a Remote Layer 3 Query in progress. This is a normal ABORT. 1. Wait two minutes, then follow the procedures for when this test passes.
1113	ABORT	The Signaling Link is down. Therefore no messages can be sent to the Far-end switch. 1. Examine the results of Tests #636 and #639 and follow recommendations provided there. 2. If either test passes, it may be because the signaling link was disabled by system technician. Verify this by using the **display comm link** command. Tests #636 and #639 pass if the signaling link is not enabled. 3. If these tests pass and the signaling link is enabled, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.
2500	ABORT	Same as ABORT with no error code. 1. Follow the recommendations for ABORT with no error code.

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Table 11-194. TEST #637 Remote Layer 3 Query — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	FAIL	Same as ABORT with no error code. 1. Follow the recommendations for ABORT with no error code.
	PASS	A message was composed and sent to the Far-end switch. The ISDN PRI specification allows up to two minutes for a reply. 1. Check the Error Log for ISDN-SGR (ISDN-PRI Signaling Group) for errors of type 2305 for evidence of a Remote Layer 3 Query failure. If no new errors were logged since this test was run, then this switch and the Far-end switch processor can exchange call control messages. 2. If there is still a problem with a particular DS1 ISDN Trunk or PRI Endpoint Port (B-channel), busyout the trunk or port and run the long test sequence, paying particular attention to the results of Test #258 (ISDN Test Call). 3. If the problem persists and the above action has not revealed the cause, escalate the problem.

Secondary Signaling Link Hardware Check (#639)

The ISDN-PRI Signaling Group D-Channel port depends on the health of the DS1/UDS1 Interface circuit pack on which it resides. This test will fail if there are problems with either the ISDN-PRI Primary D-channel port or the DS1/ UDS1 circuit pack. If there are problems with the ISDN-PRI Secondary Signaling Channel port (ISDN-LNK or ISDN-PLK), also investigate the DS1/UDS1 circuit pack.

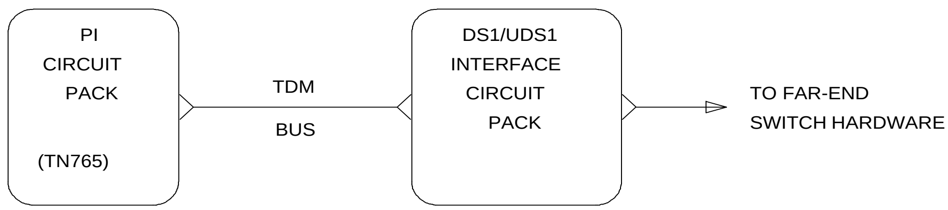

Figure 11-64. Secondary Signaling Link Hardware Check for PRI over PI (Test #639)

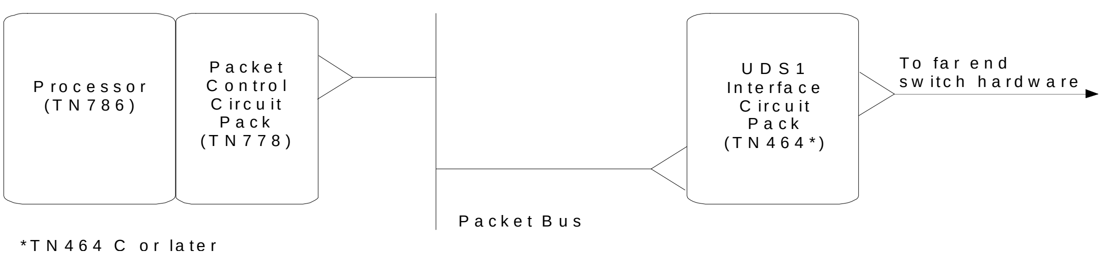

Figure 11-65. Secondary Signaling Link Hardware Check for PRI over PACCON (Test #639)

Table 11-195. TEST #639 Secondary Signaling Link Hardware Check

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.
1132	ABORT	The Secondary D-channel is not administered for this Signaling Group. This is a NORMAL ABORT. Only a Primary D-channel must be administered for a Signaling Group.
4	FAIL	There is a problem with the Processor Interface Link. No DS1 ISDN Trunk (B-channel) or Wideband PRI Endpoint calls can be made until the problem is resolved. 1. Display the Communication-Interface Links Form via the **display communication-interface** command to determine which link is down (find the one that matches the DS1 Interface circuit pack on which this ISDN-PRI Signaling Link Port resides) and then refer to the PI-LINK Processor Interface Link Maintenance documentation.
8	FAIL	There is a problem with the DS1/UDS1 Interface circuit pack or the ISDN-PRI Secondary Signaling channel (D-channel). No ISDN Trunk (B-channel) or Wideband PRI Endpoint calls can be made until the problem is resolved. 1. Refer to the DS1/UDS1 circuit pack and the ISDN-PRI Signaling channel (ISDN-LNK/ISDN-PLK) Maintenance documentation.
	PASS	The basic physical connectivity of the Signaling Group's Secondary D-channel is intact and functional. Try this test repeatedly to ensure the link is up and to uncover any transitory problems.

Layer 2 Status Test (#647)

The Layer 2 Status Test checks the layer 2 status of the ISDN-PRI Signaling Channel (D-channel). This test will fail if there is a hardware failure or a facility problem, or if the primary and secondary ISDN-PRI D-channels are not administered correctly.

The Primary and Secondary Signaling Link Hardware tests (test 636 and 639) and the Remote Layer 3 Query test (test 637) will detect most problems caused by hardware failures or incorrect administration. However, the Layer 3 test (test 637) cannot detect end-to-end transmission problems with the Standby D-channel since Layer 3 messages are not sent on the standby channel.

For G3r, the SYS-LINK Maintenance Object reports Layer 2 ISDN-PRI D-channel problems and for G3i/s/vs, the PI-LINK Maintenance Object reports Layer 2 ISDN-PRI D-channel problems (if the D-channel is connected to the Processor Interface circuit pack). However, for G3i, the PI-LINK Maintenance Object does not monitor the Layer 2 status of the ISDN-PRI D-channel when the D-channel is connected to the Packet Control circuit pack for the ISDN-PRI over PACCON feature. The Layer 2 Query test is provided to detect D-Channel Layer 2 failures and generate an associated Warning alarm independent of the hardware configuration used for the D-channels.

Table 11-196. TEST #647 Layer 2 Status Query Test

Error Code	Test Result	Description/ Recommendation
1132	ABORT	Internal System Error: The port location for the primary ISDN-PRI D-channel is not known. This condition should not be possible since an administered DS1 circuit pack must be specified when a Signaling Group is administered: 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.
1134	ABORT	Internal System Error: The associated DS1 circuit pack is not administered. This condition should not be possible since an administered DS1 circuit pack must be specified when a Signaling Group is administered. 1. Retry the command at one minute intervals a maximum of three times. 2. If the test continues to abort escalate the problem.
2500	ABORT	Internal System Error: 1. Retry the command at one minute intervals a maximum of five times. If the test continues to abort escalate the problem.

Continued on next page

Table 11-196. TEST #647 Layer 2 Status Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	Layer 2 of the primary signaling channel is down: 1. Examine the results of the Primary Signaling Link Hardware Test (#636) and follow recommendations provided there. 2. If test #636 passes, the Layer 2 Query test may still fail if the Signaling Channel at the far end has not been administered correctly or if it has been busied out. Verify that the Primary Signaling Channel (D-channel) at the far end has been administered correctly. Verify that the DS1 port used for the Primary D-channel has not been busied out at the far end. 3. If test 647 still fails, follow normal escalation procedures.
2	FAIL	Layer 2 of the secondary signaling channel is down. 1. Examine the results of Secondary Signaling Link Hardware Test (#639) and follow recommendations provided there. 2. If tests #639 passes, the Layer 2 Query test may still fail if the Signaling Channel at the far end has not been administered correctly or if the Signaling Channel has been busied out. Verify that the Secondary Signaling Channel (D-channel) at the far end has been administered correctly. Verify that the DS1 port used for the Secondary D-channel has not been busied out at the far end 3. If test 647 still fails, follow normal escalation procedures. *Continued on next page*

Table 11-196. TEST #647 Layer 2 Status Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	Both the primary and secondary Channels are down. 1. Examine the results of the Primary and SecondarySignaling Link Hardware Tests (#636 and #639) and follow recommendations provided there. 2. If tests #636 and #639 pass, the Layer 2 Query test may still fail if the Signaling Channels at the far end has not been administered correctly or if the Signaling Channels have been busied out. Verify that the Primary and Secondary Signaling Channel (D-channels) at the far end have been administered correctly. Verify that the DS1 ports used for the Primary and Secondary D-channels have not been busied out at the far end. 3. If test 647 still fails, follow normal escalation procedures.
	PASS	The Primary Signaling Channel is up and, if administered the Secondary Channel is up.

ISDN-TRK (DS1 ISDN Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
ISDN-TRK[1]	MAJOR[2]	test port PCSSpp l	DS1 ISDN Trunk
ISDN-TRK	MINOR	test port PCSSpp l	DS1 ISDN Trunk
ISDN-TRK	WARNING	test port PCSSpp sh	DS1 ISDN Trunk

1 For additional repair information, also see DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

A DS1 ISDN Trunk is known as a B-channel. It is a 64 kbps Bearer channel that can be used to transmit digital traffic, be it voice or data. These trunks use a separate channel for signaling (for example, for call setup); this mode of operation is known as out-of-band signaling, as opposed to in-band, robbed-bit signaling, where the signaling traffic flows over the same channel as the voice or data traffic. The separate signaling channel is called a D-channel in ISDN terminology, and it carries all the call control signaling messages for the DS1 ISDN Trunk B-channels. The D-channel for these B-channels is an ISDN-PRI (Primary Rate Interface) Signaling Link Port (ISDN-LNK/ISDN-PLK).

On 24 channel interfaces, any of the first 23 ports on the DS1/UDS1 interface circuit pack can be a B-channel. The 24th port may be used as a B-channel or as a D-channel depending on the type of ISDN-PRI Signaling Group (ISDN-SGR) to which it belongs. On 32 channel interfaces, any of ports 1-15 and 17-31 on the DS1 interface circuit pack can be a B-channel. The 16th port may be used as a B-channel or as a D-channel depending on the type of ISDN-PRI Signaling Group (ISDN-SGR) to which it belongs. For more details, refer to the ISDN-SGR and DS1-BD/UDS1-BD Maintenance documentation.

NOTE:

If a Packet Control circuit pack is used instead of a Processor Interface Link as the interface of the PBX SPE to the D-channel, then the signaling link port on the UDS1 circuit pack is referred to as ISDN-PLK and only the TN464C or later may be used to carry D-channel Signaling. The B-channels may be carried by any DS1/UDS1 interface circuit pack. If a Processor Interface is used for connectivity then the Signaling Link port is referred to as a ISDN-LNK and the TN767 or TN464B or later DS1 interface circuit pack may be used to carry D-channels Signaling.

For interfaces using country protocol 1 on the DS1 Circuit Pack administration form (including US), the signaling protocol used for the maintenance of the

B-channel is defined by the AT&T ISDN-PRI Specification. For interfaces using country protocols other than 1, the signaling protocol used for the maintenance of the B-channel is defined by the CCITT ISDN-PRI Specification.

There are five possible SERVICE STATES for a B-channel. The service state is negotiated with the far-end switch, changes over time, and may have a far-end or near-end component. The service state is initialized to Out-Of-Service/Far-End state and an attempt is made to negotiate it to In-Service.

NOTE:
The service state of a particular DS1 ISDN Trunk B-channel can be displayed by issuing the **status trunk <trunk_group/trunk_member>** system technician command.

If a call is present, the Specification defines the permissible CALL STATES as well. There are tests in the Short and Long Test Sequences for DS1 ISDN Trunk designed to audit these states and ensure agreement between both ends of the PRI connection.

Alarming Based on Service States

A warning alarm is logged against a DS1 ISDN B-channel trunk when it is placed in the Maintenance/Far-End or Out-Of-Service/Far-End states, during which the trunk is unusable for outgoing calls. When a warning alarm is present, use **status trunk group#/member#** command to determine the exact state. Other alarms can be diagnosed by using the short and/or long test sequences. Note that an ISDN B-channel trunk can be placed in a Far-End service state by either action taken by the far-end switch or by failure of the far-end switch to respond. For example, if the far-end does not respond to a Remote Layer 3 Query (Test #637 for ISDN-SGR), the associated DS1 ISDN trunk B-channels will be placed in the Maintenance/Far-End service state.

As a port on a DS1 circuit pack (DS1-BD or UDS1-BD), and as part of a signaling group dependent on a D-channel (ISDN-LNK/ISDN-PLK) for signaling, operation of the ISDN-TRK is dependent on the health of these other maintenance objects. The ISDN D-channel in turn depends on the Packet Bus (PKT-BUS)/Processor Interface Link (PI-LINK) (dependent on setup) for transmission through the system. Keep this hierarchy of dependencies in mind when diagnosing problems.

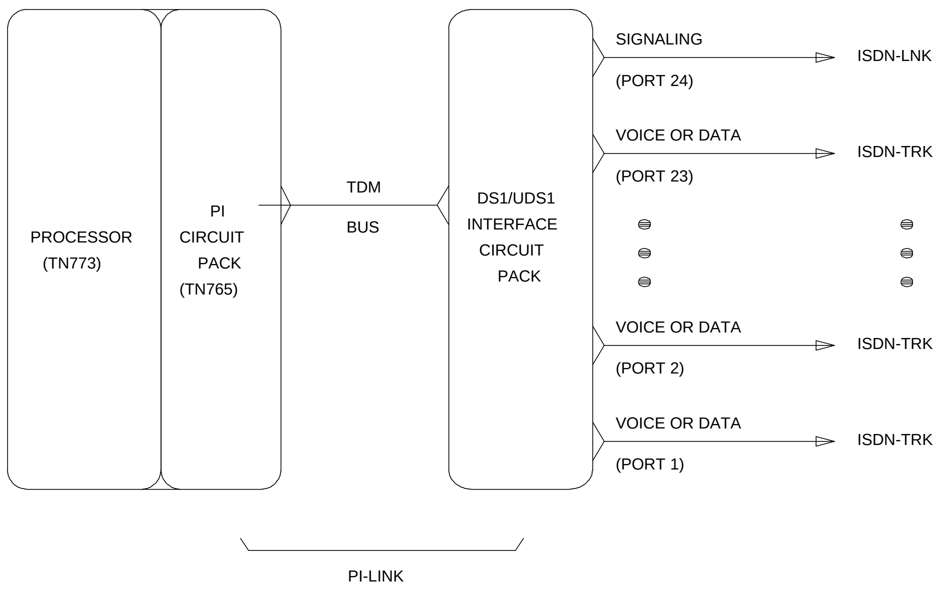

Figure 11-66. DS1 ISDN Trunk Interactions (24-channel interface)

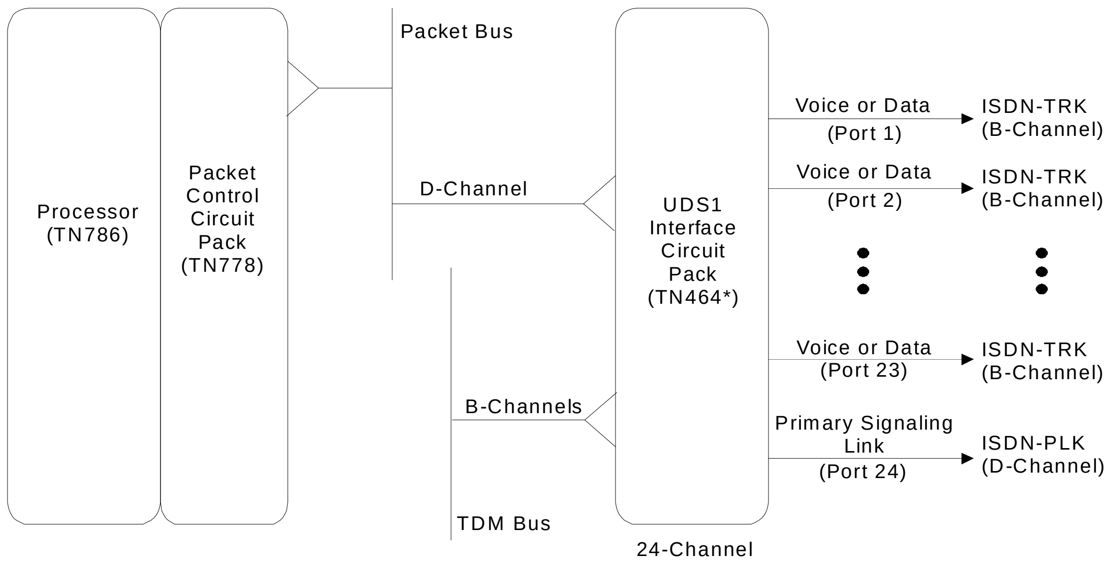

Figure 11-67. PRI Over PACCON DS1 ISDN Trunk Interactions (24-channel interface)

DS1 ISDN Trunk Service States

This section defines the possible service states of a DS1 ISDN trunk, explains the reason for each service state, and provides the recommended recovery procedures (when required).

Service States

- In-Service (INS)

  The B-channel is in its normal operating state.

- Out-of-Service/Far-end (OOS/FE)

  A B-channel is initialized to this state when administered and it may also be in this state if there is a failure on the B-channel attributed to a problem on the far-end switch. The switch sends messages to the far-end to negotiate the B-channel into service. If the far-end does not respond to the messages within a certain time period, then the service state remains out-of-service and maintenance will periodically resend the messages. The trunk is unusable for outgoing calls. On US interfaces, the trunk is unusable for incoming calls, but on non-US interfaces, incoming calls will be accepted.

- Out-of-Service/Near-end (OOS/NE)

  This is the state of the trunk when a hardware failure exists on the link, the NPE Crosstalk Test fails, or when the trunk is busied out by system technician. In this state, the trunk is unusable for incoming or outgoing calls. No messages are sent to the far-end until the signaling link comes back into service or the trunk is released by system technician.

- Maintenance/Far-end (MTC/FE)

  This state is reached when the far-end does not respond to messages sent over the signaling link for a particular trunk after a certain amount of time. This state is different from OOS/FE since the signaling link must have initially been up and the B-channels in-service. The switch will periodically send messages to the far-end to try to negotiate the trunk (B-channel) into service. The trunk is unusable for outgoing calls but will service incoming call requests from the far-end. Note that transitions into MTC/FE do not drop stable calls. Therefore, if the service state changes from in-service to MTC/FE, then stable calls are unaffected.

- Maintenance/Near-end (MTC/NE)

  The trunk (B-channel) is in this state if the signaling link (PI-LINK) is busied out by system technician. The trunk (B-channel) is also temporarily in this state if system technician has issued a **test trunk trunk_group/trunk_ member long** command. This command will execute the ISDN-PRI test call. This test will change the state of the trunk member to MTC/NE for the duration of the test unless a call request comes in from the far-end. In that case, the test would abort. Note that transitions into MTC/NE do not drop stable calls. Therefore, a system technician- demanded **busyout link lnk-no** command will not drop stable trunk calls. In this state, the B-channel is not usable for new outgoing calls, but is available for incoming calls and outgoing test calls.

- Pending States

  If the near-end is expecting a timed response from the far-end for a request to change the service state of a trunk, then the state of the trunk reflects a Pending State.

  — Pending-in-service (PINS)

    The near-end has sent a B-channel maintenance message to the far-end, requesting that the B-channel service state be transitioned to in-service. The far-end has a certain amount of time to respond to the message. The service state will be PINS until either a response is received or the timer expires.

  — Pending-maintenance (PMTC)

    This state is supported only by systems using country protocol 1 (including US). The near-end has sent a B-channel maintenance message to the far-end, requesting that the B-channel service state be transitioned to maintenance. The far-end has a certain amount of time to respond to the message. The service state will be PMTC until either a response is received or the timer expires.

— Call Activity States

In addition to the service and pending state, the state of a B-channel also reflects its call activity. If a call is connected over the B-channel, then the state of the trunk will reflect the "active" call state, for example, "in-service/active." If there is no call on the B-channel, then the trunk will reflect the "idle" call state, for example, "OOS/FE-idle."

The following diagram of the DS1 ISDN Trunk service states shows the common progression from one service state to another and the event that caused the change of state.

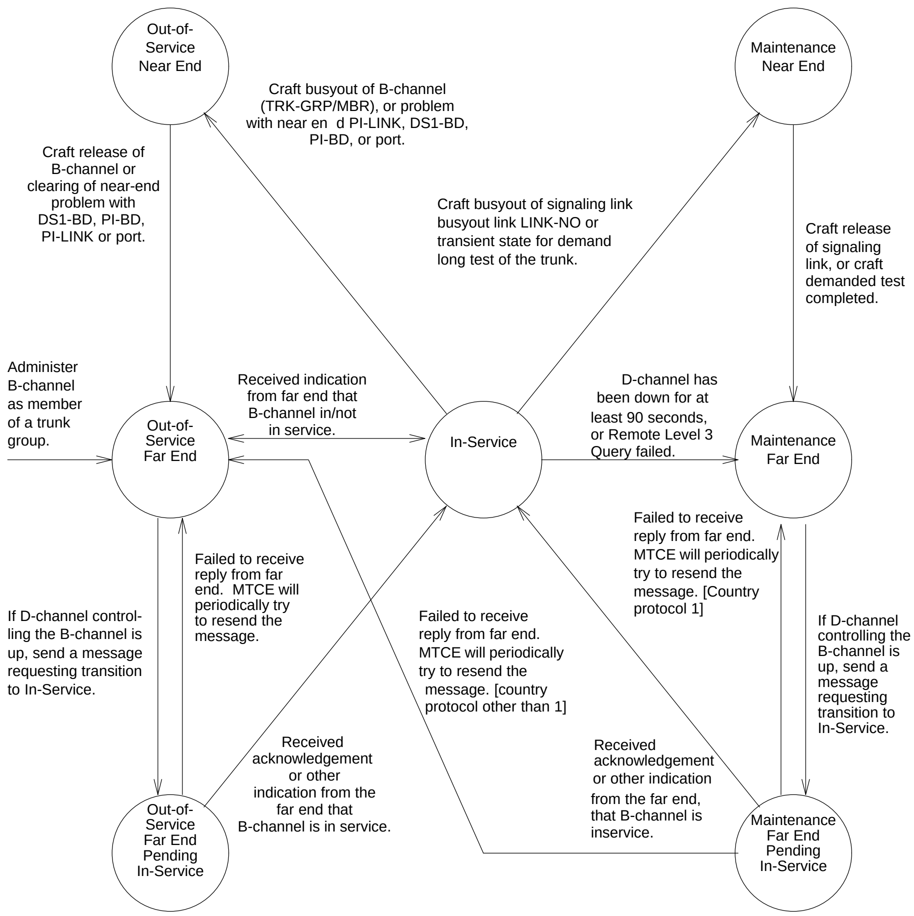

Figure 11-68. Common Progressions in Service States

ISDN-PRI Trunk Service States

The following chart summarizes each of the different DS1 ISDN Trunk service states that can result when the **status trunk <trunk_group/trunk_member>** command is issued.

NOTE:
Refer to "Troubleshooting ISDN-PRI Problems" in Chapter 5, "Routine Maintenance Procedures" for a layered approach to the processing of ISDN-PRI problems.

Table 11-197. ISDN-PRI Trunk Service States (Test #161 Loop Around Test)

Service State	Alarm*	Possible Cause	Possible Solution
out-of-service/NE	Warning	Trunk is demand busied out.	Enter **release trunk** grp#/mbr#.
	Minor	NPE Crosstalk Test (#6) failed.	Replace DS1/UDS1 circuit pack.
	None	DS1 or UDS1 circuit pack lost its signal.	Is the DS1/UDS1 circuit pack or cable removed? Is the far-end switch restarting? Check circuit pack using procedures in DS1-BD or UDS1-BD.
out-of-service/FE	Warning	Unadministered far-end	Administer corresponding trunk on far-end switch.
	Warning	The far-end trunk is busied out.	Check the status of the far-end switch.
pending-in-service, pending-maint	None	Maintenance message was sent and the switch is waiting up to 2 min. for a reply from the far-end.	Wait 2 minutes and check service state after the pending state has cleared.
maint-NE	None	ISDN test call in progress (**test trunk long** and **test isdn-testcall** commands)	Wait several minutes for test to finish and check status again.
	None	System link has been busied out by command.	Check link status. Release link with **release link** link#.

Continued on next page

Table 11-197. ISDN-PRI Trunk Service States (Test #161 Loop Around Test)

Service State	Alarm*	Possible Cause	Possible Solution
maint-FE	Warning	Signaling channel has been down for over 90 sec.	Consult ISDN-SGR and/or ISDN-LNK. Far-end signaling channel may be busied out, or the far-end switch may currently be restarting.
	Warning	Repeated failure of far end to respond to messages.	Maintenance software will periodically try to resend messages. You can speed the process with **test trunk grp#/mbr#** and/or **test signaling-gr #**.
	Warning	The far-end trunk is being tested.	Check status of the far-end switch. Wait for testing to finish.
in-service	None	Normal operating state	

Hardware Error Log Entries and Test to Clear Values

Table 11-198. DS1 ISDN Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	Any	None			test port PCSSpp sh r 1
15 (b)	Any	Audit and Update Test (#36)			
18	0	busyout trunk <grp>/<mbr>			release trunk <grp>/<mbr>
129 (c)		None	WARNING	OFF	test port PCSSpp
130 (d)		None	WARNING	ON	test port PCSSpp
257 (e)	Any	None			test port PCSSpp
513 (f)	Any	None	WARNING	OFF	test port PCSSpp
769 (e)	Any	None			test port PCSSpp
1281	Any	Conference Circuit Test (#7)	MIN/ WRN[2]	ON	test port PCSSpp l r 4
1537	Any	NPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 3
1793 (g)	Any	None			test port PCSSpp
3073 (h)	Any	Service State Audit (#256)			test port PCSSpp
3585 (i)	Any	None			None
3841 (j)	Any	None			None

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the Minor alarm is not downgraded by the **set options** values, then the Minor alarm will be upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Notes:

a. These error types indicate a disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN *call* state of the DS1 ISDN Trunk. This switch will automatically try to recover by clearing the call, (that is, the call will be torn down). You can use the **status trunk <trunk_group/trunk_member>** command to determine the state of the trunk.

   When running the Short Test Sequence of tests, pay close attention to the results of the Call State Audit Test (#257).

b. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

c. The far-end switch changed its ISDN *service* state to either out-of-service or maintenance. This may be a temporary condition due to testing of that trunk by the far-end *or* a hardware problem with the trunk. Outgoing calls will not be allowed over the trunk. To investigate the status of the trunk, issue the **status trunk <trunk_group/trunk_member>** command.

d. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. These error types indicate a disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN service state of the DS1 ISDN Trunk. This switch will automatically try to recover by performing a service state audit. You can use the **status trunk <trunk_group/trunk_member>** command to determine the state of the trunk.

   When running the Short Test Sequence, pay close attention to the results of the Service State Audit Test (#256).

f. This trunk is not recognized by the far-end switch. Investigate the trunk administration for both switches and make changes as necessary.

g. This error indicates a failure of the DS1/UDS1 Interface circuit pack. When running the Short Test Sequence, the results of the Signaling Link State Check Test (#255) are important.

h. Two Service State Audit attempts have failed (see Test #256). The trunks will not be usable for any outgoing calls (although incoming calls will be accepted) until the test passes and the trunk state is changed to in-service (use **status trunk trunk_group/trunk_member** to investigate trunk status).

i. Error Type 3585 appears when the switch receives an ISDN RESTART message for an ISDN trunk. Calls are cleared with the RESTART message. Therefore, this error type may be associated with a dropped call report from a user.

The following Aux Data values for Error Type 3585 represent the trunk's ISDN call state at the time the unexpected request to restart the channel was received from the remote switch. This information can be useful if dropped calls (cutoffs) are being reported by users of the ISDN-PRI trunks. The meanings of the various Aux Data values are shown below.

Aux values of concern; any others can be ignored.

0	A idle trunk receved a restart.
10	A call in a stable, talking state was cleared unexpectedly by the far-end with an ISDN RESTART message. This state is called the "active" state.
4, 7, 8 260, 263	A call that has not reached the active state, but has at least reached a ringing state, was cleared unexpectedly by the far-end with an ISDN RESTART message.
1, 3, 6 9, 265	A call that has not yet reached a ringing state was cleared unexpectedly by the far-end with an ISDN RESTART message.
11, 12 19, 531, 267, 268	A call that was in the process of clearing anyway has been cleared by the far-end with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far-end is attempting to clear trunks that it thinks are in a "hung" state. The RESTART message brings the trunk to an idle condition.

j. An ISDN trunk selected by the near-end has been rejected 10 times by the far-end without a successful call. This may indicate a service state mismatch between the near-end and far-end for this trunk that is effecting the end user (that is, customer receives unexpected intercept tones when accessing ISDN trunks). This may indicate that the ISDN trunk is not administered on the far-end.

   The Aux field contains the physical name of the ISDN trunk in decimal. Then, verify that the far-end has this trunk administered. If problems persist, then busy-out the ISDN trunk to take it out of the hunt group.

   The Warning alarm will be retired automatically whenever an outgoing or incoming call that uses this trunk is answered by the called endpoint. If problems persist, then busy-out the ISDN trunk to take it out of the hunt group.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Audit and Update Test (#36)	X	X	ND
Signaling Link State Check Test (#255)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND
ISDN Test Call Test (#258)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

NOTE:
The TN464C or later UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.

Table 11-199. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** commands to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-199. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-Bus errors. Refer to TDM-Bus Maintenance to diagnose any active TDM-Bus errors. 1. If the system has no TDM-Bus errors and is not handling heavy traffic, repeat the test at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** or **status trunk** commands to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Maintenance is disable on this trunk. 1. Enable maintenance by entering ‘‘y’’ in the ‘‘Maintenance Tests?’’ field on page 2 of the **change trunk-group** form.
1117	ABORT	A service state audit message is outstanding. 1. Wait two minutes and then try again.

Continued on next page

Table 11-199. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. The ISDN-TRK is moved to out-of-service/near-end state. 1. Replace the circuit pack.
	PASS	The port is able to communicate over the TDM Bus.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

NOTE:
The TN464C or later UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.

Table 11-200. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** commands to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use status station or status trunk to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Maintenance is disabled on this trunk. 1. Enable maintenance by entering “y’’ in the “Maintenance Tests?’’ field on page 2 of the **change trunk-group** form.

Continued on next page

Table 11-200. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 interface circuit pack to assure that the trunk's translation is correct. The port audit operation verifies the consistency of the current state of trunk kept in the DS1 interface circuit pack and in the switch software.

Table 11-201. TEST #36 Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
1018	ABORT	Maintenance is disabled on this trunk. 1. Enable maintenance by entering "y" in the "Maintenance Tests?" field on page 2 of the **change trunk-group** form.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Test failed due to internal system error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 interface circuit pack and switch software are consistent. If the trunk is busied out, the test will not run, but will return PASS. To verify that the trunk is in-service: 1. Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release-trunk** command to put trunk back into in-service. 3. Retry the test command.

Signaling Link State Check Test (#255)

As noted in the general description for a DS1 ISDN Trunk, it depends on the health of the DS1/UDS1 interface circuit pack and the ISDN-PRI D-channel (ISDN-LNK/ISDN-PLK) trunk for proper operation. This test checks the status of those critical elements.

Table 11-202. TEST #255 Signaling Link State Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
1018	ABORT	Maintenance is disable on this trunk. 1. Enable maintenance by entering ‘‘y’’ in the ‘‘Maintenance Tests?’’ field on page 2 of the **change trunk-group** form.
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
4	FAIL	There is a problem with the Signaling Channel. 1. If the Packet Control circuit pack is used consult the procedures for the ISDN-PRI Signaling Group (ISDN-SGR). Further information may also be obtained by consulting the procedures for the ISDN-PRI Signaling Channel (ISDN-PLK). 2. If the Processor Interface is used consult the procedures for Processor Interface Link (PI-LINK).
8	FAIL	There is a problem with the DS1 interface circuit pack. 1. Consult the procedures for DS1 interface circuit pack (DS1-BD/UDS1-BD).
	PASS	The signaling link hardware is OK.

Service State Audit (#256)

As noted in the General description for DS1 ISDN Trunk, these trunks may be in one of several service states. This test performs a Service State Audit with the far-end switch.

For interfaces using country protocol 1 (including US), the Service State Audit executes in all trunk service states. A message is sent to the far-end switch to ensure that both sides agree on the service state. A PASS for this test simply means that the message has been successfully sent. Two minutes are allowed for a reply. If no reply is received within that 2 minute window, the message is sent out again. If that attempt fails, an error will be logged (Error Type 3073) and the switch will then attempt another Service State Audit every 15 minutes. If the trunk was initially INS (in-service), it will then be placed in the MTC/FE (maintenance state, far-end problem) state. No outgoing calls will be placed over this trunk, but incoming calls will be accepted. If an incoming call is presented while in such a state, a Service State Audit attempt will immediately be attempted (that is, the switch will not wait for the 15-minute cycle, but will instead try to recover immediately).

For interfaces not using country protocol 1, the Service State Audit executes only if the trunk is in the OOF/FE state. A message is sent to the far-end switch to attempt to bring the trunk back into the in-service state. A PASS for this test simply means that the message has been successfully sent. Two minutes are allowed for a reply. If no reply is received within that two minute window, the message is sent out once again. If no response is received in the next two minute window, then the trunk remains in the OOS/FE state. The switch will attempt another Service State Audit in another hour.

To investigate the service state of the DS1 ISDN Trunk, issue the **status trunk trunk-group/trunk-member** command.

Table 11-203. TEST #256 Service State Audit Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be on a valid call. Use **status station** or **status trunk** to determine when trunk is available for testing. 1. Check the results of Test #255 (Signaling Link State Check).
1018	ABORT	Maintenance is disable on this trunk. 1. Enable maintenance by entering "y" in the "Maintenance Tests?" field on page 2 of the **change trunk-group** form.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. 1. Check the results of Test #255 (Signaling Link State Check).
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1116	ABORT	The trunk is not in a service state which is appropriate for running the test. This test is only performed in the OOS/FE state.
1117	ABORT	A service state audit message is outstanding. 1. Wait two minutes and then try again.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1113	FAIL	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. 1. Consult the procedures for ISDN-LNK (ISDN-PRI Signaling Link Port) and PI-LINK (Processor Interface Link).

Continued on next page

Table 11-203. TEST #256 Service State Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	Wait 4 minutes and then check the Error Log for any new errors of type 3073. If there are none, then both sides of the ISDN connection agree on the service state; the negotiation succeeded. If there is a new 3073 error, then the negotiation failed (the far-end switch twice failed to respond within 2 minutes). The switch will automatically retry every 15 minutes. If the trunk was initially in-service, it is now placed in the maintenance/far-end state. Incoming calls will be accepted, but no outgoing calls can be originated. If an incoming call is presented, another Service State Audit will be immediately performed in an attempt to put the DS1 ISDN Trunk in the proper state.

Call State Audit Test (#257)

If a call is active on the trunk, the switches on both sides of the connection should agree on the ISDN state of the call, as defined in the ISDN Protocol Specification. This test audits internal call state data by querying the far-end switch as to the ISDN state of the call. It can be helpful when trying to clear a hung call. If the internal call state data on the near-end switch is different than that of the far-end switch, then **the call will be torn down.**

As with Test #256 (Service State Audit), a PASS simply means that an appropriate message was composed and sent to the far-end switch. The ISDN Specification allows up to two minutes for a reply. If a reply is not received within the two minute window, a protocol time-out violation will be recorded in the error log against the associated signaling channel (ISDN-PRI Signaling Link Port, which is listed in the Error Log as ISDN-LNK/ISDN-PLK; the Error Type is 1).

Table 11-204. TEST #257 Call State Audit Test

Error Code	Test Result	Description/ Recommendation
1018	ABORT	Maintenance is disable on this trunk. 1. Enable maintenance by entering “y’’ in the “Maintenance Tests?’’ field on page 2 of the **change trunk-group** form.
1019	ABORT	An audit is already in progress. 1. Wait two minutes and try again.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. 1. Check the results of Test #255 (Signaling Link State Check).
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1116	ABORT	The trunk is in an out-of-service ISDN service state. 1. A call cannot be present if the trunk is in an ISDN out-of-service state, so a call state audit would be inappropriate. No action necessary. (Use the **status trunk**

Continued on next page

Table 11-204. TEST #257 Call State Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	This switch sent a call state auditing message to the far-end switch to verify the state of the call active on this trunk. If a call state mismatch is found, then the call will be torn down within two minutes. If no call was active, then no message was sent.

ISDN Test Call Test (#258)

This test performs a far-end loop around to a far-end switch over an ISDN trunk. The trunk's service state must be in-service, maint-NE, or out-of-service/NE, and no call can be active on the trunk. The test call can be initiated as part of a long test sequence, or as an individual test, as described below. This test is valid only for systems using country protocol 1 (including US), or when the far end has loop-around capability.

A test call connection is established to a far-end switch over the ISDN trunk to be tested. The digital port on a TN711D Maintenance/Test circuit pack generates a test-pattern bit stream which is sent to the far-end switch and echoed back. The received pattern is then compared to the sent pattern and checked for errors that indicate a loss of integrity on the communications path.

If a test call is running when scheduled maintenance starts, the green LED is turned off. To determine if a test call is still running, use the **list isdn-testcall** and **status isdn-testcall** commands. A lit yellow LED on the Maintenance/Test circuit pack also indicates that a test call is running.

There are two methods available to place an outgoing ISDN-PRI test call in G3iV1.1-286 and G3iV2-386.

In the first method, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a data channel. This method is selected when no Maintenance/Test circuit pack resides in the system.

In the second method, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a digital trunk testing port on the Maintenance/Test circuit pack. The Maintenance/Test Digital Port generates a pseudo bit stream. A pictorial description of the outgoing ISDN-PRI test call connectivity is contained in the following figure.

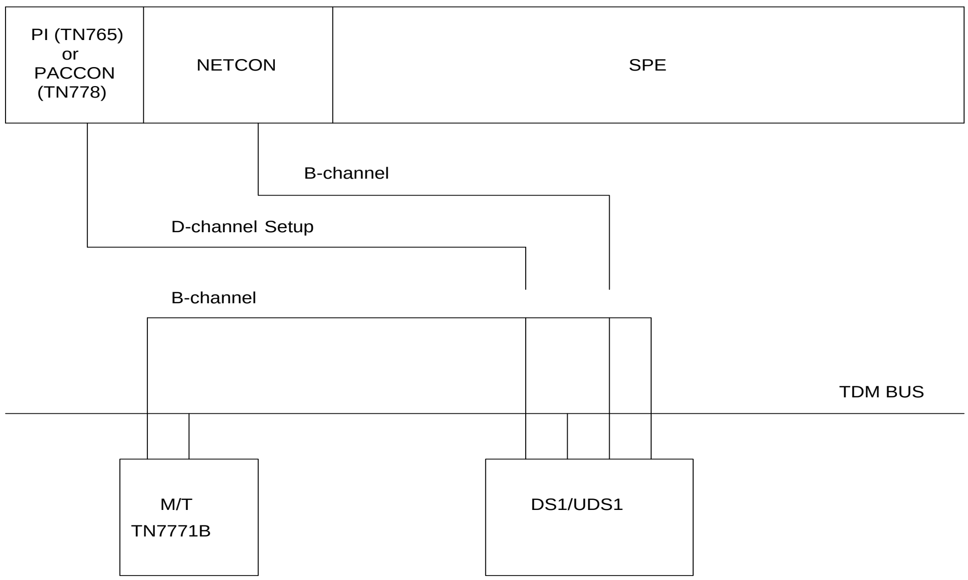

Figure 11-69. ISDN-PRI Outgoing Test Call

Synchronous Commands

You can demand a synchronous outgoing test call by using the following maintenance commands:

- **test trunk trunk-group-no/member-no long [repeat number]**
- **test board board-location long [repeat number]**
- **test port port-location long [repeat number]**

Whenever a circuit translates to an ISDN-PRI trunk during a Long Test Sequence, an outgoing test call is invoked. If the B-channel is unrestricted (B8ZS or HDB3) the default duration of the test call is 8.6 seconds. Otherwise, if the B-channel is restricted (ZCS) the default duration of the test call is 9.4 seconds. Once the test call completes, the bit error rate is retrieved from the Maintenance/Test Digital Port. A bit error rate greater than zero is reported as a failure to the Manager I terminal (MGRI). A failure indicates the need to run further diagnostics, such as the **test isdn-testcall** command.

If no Maintenance/Test circuit pack exists, the outgoing ISDN-PRI test call is established over a high speed data channel on the Network Control (NETCON) circuit pack (DATA-BD).

Asynchronous Commands

You can start, query, and stop an outgoing test call by using the following maintenance commands:

- **test isdn-testcall trunk-group-no/member-no [minutes]**

  This command enables you to start an outgoing ISDN-PRI test call for a maximum of two hours (120 minutes).

- **status isdn-testcall trunk-group-no/member-no**

  This command displays the progress of the outgoing test call by reporting the bit and block error rates of the tested B-channel specified by the "trunk group no/member no" identifier.

- **clear isdn-testcall trunk-group-no/member-no**

  This command enables you to stop an outgoing test call already in progress. The **trunk-group-no/member-no** identifier specifies the B-channel used to stop the test call. The measurements are not cleared until the next test call begins.

NOTE:
Only one trunk can be tested in a given port network, until the test call is canceled or completes.

Table 11-205. TEST #258 ISDN TEST Call

Error Code	Test Result	Description/ Recommendation
4	ABORT	There is a problem with the Processor Interface Link. 1. Refer to the PI-LINK (Processor Interface Link) Maintenance documentation.
8	ABORT	There is a problem with the DS1 interface circuit pack. 1. Refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation.
1004	ABORT	B channel in use. 1. Determine if a call is active on this DS1 ISDN Trunk via the **status trunk** 2. When the service state indicates in-service/idle, retry the test.

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	Bad Configuration (that is, no Maintenance/Test circuit pack) Issue the **test trunk <trunk Group/trunk member>** command and make sure there is a DATA-CHL (NETCON channel) administered.
1018	ABORT	Test call is disabled. 1. Enable Maintenance on the Trunk Group form.
1019	ABORT	Another Test call is in progress. 1. Issue the **list isdn-testcall** command to locate the test call. 2. Issue the **status isdn-testcall** command to find out the duration and start time of the test call. 3. Issue the **clear isdn-testcall** command to stop the test call from running. 4. If time and duration indicate that the test call should have stopped, and the **clear isdn-testcall** command does not work, refer to M/T-DIG (Maintenance/Test Digital Port) Maintenance documentation for recommended maintenance strategy.
1020	ABORT	There is a problem with DS1 Interface Circuit Pack. 1. Refer to the DS1-BD (DS1 Trunk circuit pack) Maintenance documentation.
1024	ABORT	(M/T-DIG) Maintenance/Test Digital Port in use. 1. Wait until yellow and green LEDs are turned off on the M/T-BD (Maintenance/Test circuit pack). 2. Retry the test. If problem persists, refer to M/T-DIG (Maintenance/Test Digital Port) Maintenance documentation.
1113	ABORT	The signaling link has failed. Therefore, the system cannot send any messages on behalf of this trunk. 1. Check the results of Test #255 (Signaling Link State Check Test).

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1116	ABORT	The switch could not appropriately change the ISDN service state. 1. Determine if a call is active on this DS1 ISDN Trunk (use the **status trunk** 2. If not, check the Error and Alarm Logs for problems with this ISDN-TRK (DS1 ISDN Trunk) MO.
1117	ABORT	ISDN B-channel maintenance message is already outstanding. 1. Wait two minutes. Then try again.
1118	ABORT	Far-end of ISDN trunk is not administered. 1. Check the administration of the far-end ISDN trunk. 2. Issue the **status trunk** 3. Try the test again.
1119	ABORT	The test call was aborted due to a normal call attempt on this trunk. The test call is performed only if the trunk is idle. 1. Either wait for the normal call to terminate normally, or force it to be dropped by using the **busyout trunk**
1120	ABORT	The DS1 ISDN Trunk is in the ISDN out-of-service/far-end state. 1. Try to change the service state via Test #256 (Service State Audit Test). Then retry this test. **However, the trunk may be in the out-of-service/far-end state due to problems at the far-end switch. If that is the case, no remedial action can be taken at this end.**
1122	ABORT	There is no test line number for the far-end switch. 1. Check the Trunk Group Administration form.

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
1123	ABORT	There is no Feature Access Code administration for this Facility Test. 1. Check the Dial Plan and Feature Administration forms.
2012 None 2000	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2035	ABORT	The call has timed out, perhaps because of a lack of system resources. 1. Wait one minute and try again. 2. If the test continues to abort, escalate the problem.
2036 2037	ABORT	Internal System Error. 1. Follow the recommendation for ABORT code 2012.
2038 2039	ABORT	A problem occurred while trying to read the test data. 1. Wait one minute and then try again. 2. If the test aborts again in the same manner, there is a serious internal problem. If so, escalate the problem.
2040	ABORT	Internal System Error. 1. Follow the recommendations for ABORT code 2012.
2041	ABORT	The call has timed out, perhaps because of a lack of system resources. 1. Follow the recommendations for ABORT code 2035.
2066	ABORT	Could not establish test call. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2067	ABORT	The call has timed out, perhaps because of a lack of system resources. 1. Follow the recommendations for ABORT code 2035.

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
2074	ABORT	Bit and Block Error query failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, there may be a serious internal problem with M/T-DIG (Maintenance/Test Digital Port). If this is the case, refer to the M/T-DIG (Maintenance/Test Digital Port) Maintenance documentation.
2075	ABORT	Internal System Error. 1. Follow the recommendations for ABORT code 2012.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2104	ABORT	Call dropped or could not be originated. 1. Make sure service is provisioned by the network. 2. Check the administration of the far-end test line extension on the trunk group administration form. 3. Check the administration of the test call BCC (Bearer Capability Class) on the trunk group administration form. 4. Check the reason for termination with **status isdn-testcall**. 5. For further instructions see "Troubleshooting ISDN-PRI Test Call Problems" in Chapter 5, "Routine Maintenance Procedures". 6. Try the test again. 7. If the test continues to abort, escalate the problem.

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
2201 2202 2203 2204 2205	ABORT	Internal System Error. 1. Follow the recommendations for ABORT code 2012.
2206	ABORT	Could not allocate the necessary system resources to run this test. 1. Follow the recommendations for ABORT code 2100.
2208	ABORT	Internal System Error. 1. Follow the recommendations for ABORT code 2012.
2209 2210	ABORT	Could not allocate the necessary system resources to run this test. 1. Follow the recommendations for ABORT code 2100.
2211	ABORT	Internal System Error. 1. Follow the recommendations for ABORT code 2012.
2212	ABORT	Call terminated by unexpected disconnect. 1. Wait one minute and then try again.
2213	ABORT	The call has timed-out, perhaps because of a lack of system resources. 1. Follow the recommendations for ABORT code 2035.
2214	ABORT	Call terminated by unexpected disconnect. 1. Wait one minute and then try again.
2215 2216 2217 2218 2219	ABORT	Internal System Error. 1. Follow recommendations for ABORT code 2012.
2220	ABORT	Call terminated prematurely. 1. Wait one minute and try again.

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Table 11-205. TEST #258 ISDN TEST Call — *Continued*

Error Code	Test Result	Description/ Recommendation
2221 2222 2223 2224 2225 2226	ABORT	Internal System Error. 1. Follow recommendations for ABORT code 2012.
2227	ABORT	Could not allocate the necessary system resources to run this test. 1. Follow the recommendations for ABORT code 2100.
2042	FAIL	**This is the main purpose of the test.** The comparison of the data sent with the data received indicates a loss of integrity on the communications path. 1. The trunk should be taken out-of-service and the quality of the DS1 line should be investigated. The investigation should include an in-depth analysis of the DS1 facility including the transmission facility and any external equipment such as DACs, CSUs, etc. If the **test isdn-testcall** command is invoked, then the investigation should include getting the bit and block error rates by invoking the **status isdn-testcall** command.
	PASS	The call worked. A test pattern was sent and received properly; the communications path is OK if the synchronous test call command was issued. If the **test isdn-testcall** command was issued, a PASS indicates that the test call was established. A **status isdn-testcall** command must be invoked to query the bit and block error rates to determine if the test call passed. An in-depth analysis of the DS1 facility including the transmission facility and any external equipment such as DACs, CSUs, etc., should take place if the bit and block error rates are not acceptable.

JNL-PRNT (Journal Printer Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PMS-PRNT/JNL-PRNT	MINOR	test journal pms-log/wakeup-log	Journal Printer Link
PMS-PRNT/JNL-PRNT	WARNING	test journal pms-log/wakeup-log	Journal Printer Link

NOTE:
Since the maintenance strategy for both the JNL-PRNT (Journal Printer Link) and PMS-PRNT (PMS Printer Link) MO is the same, both of these MOs are described in the PMS-PRNT/JNL-PRNT Maintenance documentation.

LOG-SVN (Login Security Violation)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
LOG-SVN	MAJOR	enable login <login ID>	Login Security Violation

1 Where <login ID> is the AT&T services login ID for which the security violation was detected. The *Alt Name* field indicates the login ID associated with the security violation and the major alarm.

The Security Violation Notification (SVN) feature provides notification when the number of failed attempts to access the system administration/maintenance interface meets or exceeds customer administered threshold parameters.

A major alarm is logged whenever a security violation is detected involving an AT&T services login ID and that login ID has been disabled as a result of the security violation. The capability to disable a login ID following detection of a security violation involving that login ID is administrable on a per login ID basis.

Refer to *DEFINITY Communications System Generic 3 Version 5 Implementation*, Issue 1 (555-230-656) for information on administration required for the Security Violation Notification feature and the option to disable a login ID following detection of a security violation involving the affected login ID.

Hardware Error Log Entries and Test to Clear Values

Table 11-206. Hardware Error Log Entries and Test to Clear Value

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1-15	None	None	Major	OFF	enable login <login ID>

General Information about log-svn Error Log Entries

a. The number (1 - 15), that appears in the error type field, corresponds to the location the login in the internal login data structure.

b. The *Alt Name* field on the alarm report indicates the login ID associated with the security violation and major alarm.

c. These errors/alarms are associated with a number of failed attempts to access the system management/maintenance interface using an AT&T services login ID that meet or exceed the customer administered threshold parameters. The associated alarm is immediately raised as a major alarm.

d. The affected login ID will be disabled as a result of detection of the security violation, unless it is the last enabled INADS type login on the system. The provision to disable a login ID following detection of a security violation involving that login ID is administrable on a login ID basis.

e. The *enable login* command is used to both enable a login that has been disabled, and to retire any login security violation alarms associated with the login ID.

f. Use of the *enable login* command to enable a login and/or retire alarms must be executed using a login ID with greater service level hierarchy permissions.

g. Access to the *enable login* command is controlled through the Administer Permissions field on the Command Permission Categories form. This field (Administer Permissions) must be set to "y" to access the enable login command.

h. The *Port* alarm report field will set to the port where the final invalid login attempt, involving the alarmed login ID, was detected. Valid port values for G3i products include:

   — MGR1 — Dedicated manager 1 or G3 management terminal connection

   — NET-n — Network controller dial up port

   — INADS — INADS port

   — EPN — EPN maintenance EIA port

   — EIA — Other EIA port

   Valid port value for G3r products include:

   — SYSAM_LOC — Local administration port

   — YSAM_RMT — Remote administration port

   — SYS_PORT —

   — MAINT — Maintenance port

i. The *Svc State* alarm report field will be set to OUT if the login ID is in the disabled state as a result of detection of a security violation involving the login ID. Once the login ID has been enabled, the field will be set to IN.

j. The source or reason of the failed login attempts should be identified and the cause corrected prior to re-enabling a login ID and/or retiring any alarms associated with the login ID. The cause may be something as innocuous as the failure of AT&T services automatic login software, to something as insidious as a hacker attempting to gain access to the switch system management interface.

The login ID associated with that alarm is displayed in the *Alt Name* field of the alarm report.

Prior to retiring an SVN alarm and enabling the associated login ID, the *monitor security-violations login* command can be used to access information about the invalid login attempts that caused the security violation. This information can be useful in determining the source of the invalid attempts and analyzing why they occurred.

The *list logins* command provides status information about logins on the system. If a login has been disabled as a result of a security violation, the status will be "svn-disabled."

Procedure to Retire an SVN Alarm

To retire a SVN alarm:

1. Enter the command **enable login <login ID>.**

   The login ID associated with that alarm is displayed in the *Alt Name* field of the alarm report and the alarm is retired.

MAINT (EPN Maintenance Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
MAINT	MINOR	test maintenance sh	EPN Maintenance Circuit Pack
MAINT	MAJOR	test maintenance l	EPN Maintenance Circuit Pack

The EPN (Expansion Port Network) Maintenance circuit pack monitors and supports environmental maintenance for the EPNs. An EPN can be a multicarrier or a single-carrier cabinet. The EPN Maintenance circuit pack provides the switch software, a mechanism to enable and disable Emergency Transfer in the EPN (assuming the Emergency Transfer Switch is in the AUTO position). The EPN Maintenance circuit pack invokes Emergency Transfer when the EPN loses contact with the PPN or the EPN Maintenance circuit pack loses contact with all Expansion Interface circuit packs. The EPN Maintenance circuit pack handles loss of AC power in the EPN multicarrier cabinet by turning off all power to the EPN multicarrier Cabinet 15 seconds after the loss of AC power. This 15-second period is the only nominal power holdover available in an EPN multicarrier cabinet. When power fails in the EPN single-carrier cabinet, no such power holdover is available. In the event that an Expansion Interface circuit pack goes insane and is reset six times within 15 minutes, the EPN Maintenance circuit pack holds the Expansion Links reset (which prevents the Expansion Interface circuit pack from running).

The EPN Maintenance circuit pack provides system level alarm LEDs which indicate the absence or presence of Major, Minor, and Warning alarms within the entire system (PPN and EPN).

The EPN Maintenance circuit pack supports a Manager I (G1) or G3MT (G1) or G3MT terminal which runs at 9600 baud. However, the system software throttles the rate of data flow to the EPN Maintenance circuit pack for display on the Manager I (G1) or G3MT (G1) or G3MT terminal to about 1200 baud. All system commands can be executed via the EPN Manager I (G1) or G3MT terminal. However, due to the slow speed at which the software runs the EPN Manager I (G1) or G3MT terminal, it is recommended that the EPN Manager I (G1) or G3MT terminal's primary use be for system maintenance rather than system administration.

The PPN communicates with the EPN Maintenance circuit pack via the following path (messages from the EPN Maintenance circuit pack to the PPN take exactly the reverse path). From the PPN, TN773 Processor circuit pack, EPN Maintenance circuit pack messages are passed to the Switch Control on the Network Control circuit pack over the Memory Bus (MBUS) and then over the TDM Bus to the Active PPN Expansion Interface circuit pack. The Active PPN

Expansion Interface circuit pack passes the message across the fiber to the Active EPN Expansion Interface circuit pack. The Active EPN Expansion Interface circuit pack then passes the message over a serial link to the EPN Maintenance circuit pack. Figure 11-70 illustrates this path.

In Figure 11-70, PROCR stands for TN773 for a 286, TN786B for a 386, TN790 for a RISC Processor circuit pack (the Active TN773 Processor circuit pack in a High or Critical Reliability system), NETCON stands for Network Control circuit pack (TN777) (the Active Network Control circuit pack in a High or Critical Reliability system), TDM Bus stands for the Time Division Multiplex Bus that connects circuit packs within a cabinet, Expansion Interface stands for the Active Expansion Interface circuit pack, FIBER stands for the optical fiber used to connect Expansion Interface circuit pack, and MB stands for the EPN Maintenance circuit pack. Figure 11-70 shows the connectivity for a system with duplicated Expansion Interface Links.

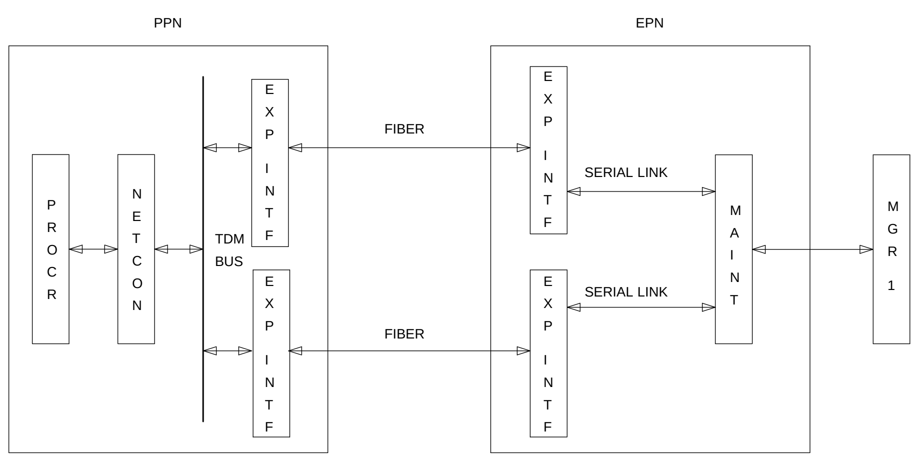

Figure 11-70. EPN Maintenance Circuit Pack Message Flow

The EPN Maintenance circuit pack must be physically inserted into the dedicated slot marked Maintenance in the A carrier of the EPN. The serial links from the EPN Maintenance circuit pack to the Expansion Links are physically connected from this dedicated slot to slots 2A01 and 2B02 (2B02 is used only if there are redundant Expansion Links). The serial link from slot 2A01 to the maintenance slot is hard-wired into the backplane of carrier A, whereas the serial link from slot 2B02 to the maintenance slot is a ribbon cable connecting the two slots. The serial link from the EPN Maintenance circuit pack to the Manager I (G1) or G3MT terminal is also a ribbon cable which plugs into a connector labeled TERM on the back of carrier A.

The maintenance strategy for the EPN Maintenance circuit pack consists of checking the integrity of the communications path to/from the EPN Maintenance circuit pack, testing individual hardware components on the EPN Maintenance circuit pack, and keeping the system level LEDs up-to-date. The individual hardware components include the serial interfaces which handle the serial links connected to the EPN Maintenance circuit pack. There are three serial interfaces, one for each possible Expansion Interface circuit pack and one for the Manager I (G1) or G3MT terminal.

Since the EPN Maintenance circuit pack supports environmental maintenance in the EPN, trouble with the EPN Maintenance circuit pack can cause environmental maintenance to falsely detect problems. In a multicarrier cabinet EPN, these environmental MOs include: POWER (Battery & Battery Charger), CARR-POW (Carrier Port Power Unit), AC-POWER (AC Power), CABINET (Cabinet Sensors), EMG-XFER (Emergency Transfer), EXT-DEV (External Alarm), and CUST-ALM (Customer-Provided Alarming Device). In a single-carrier cabinet EPN, these environmental MOs include DC-POWER (Single-Carrier Cabinet Power), EMG-XFER (Emergency Transfer), EXT-DEV (External Alarm), and CUST-ALM (Customer-Provided Alarming Device).

Since communication to the EPN Maintenance circuit pack flows through the SW-CTL (Switch Control) and the EXP-INTF (Expansion Interface) circuit packs, any problems with these MOs can prevent communication with the EPN Maintenance circuit pack.

If a repair procedure calls for the EPN Maintenance circuit pack to be replaced, and the EPN has redundant Expansion Links, the following procedure should be used to prevent an Expansion Links switch when the new EPN Maintenance circuit pack is plugged in.

1. Determine the Standby Expansion Links by using the **status system** command.
2. Busyout the Standby Expansion Links by issuing the **busyout board PCSS** command where PCSS is the 4-character circuit pack address of the Expansion Interface circuit pack in the EPN on the Standby link.
3. Replace the EPN Maintenance circuit pack.
4. Release the Standby Expansion Links by issuing the **release board PCSS** command, where PCSS is the 4-character circuit pack address of the Expansion Interface circuit pack in the EPN on the Standby link.

Hardware Error Log Entries and Test to Clear Values

EPN Maintenance Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test maintenance sh r 1
1 (a)	0 1	EPN Maintenance Circuit Pack Reset Test (#306)	MINOR	ON	test maintenance l
513 (a)	0 1	MGR I Channel Loop Test (#228)	MINOR	ON	test maintenance sh r 3
769 (b)	Any	Sanity Handshake Test (#106)			
1537 (a)	0 1	Sanity Maze Test (#303)	MINOR	ON	test maintenance sh r 3
2561 (a)	0 1	Sanity Handshake Test (#106)	MINOR	ON	test maintenance sh r 3
2817 (a)	0 (b) 1	Serial Channel Loop Test (#229)	MINOR	ON	test maintenance sh r 3
3073 (a)	0 1	Network Control Circuit Pack DPR Test (#104)	MAJOR/ WARNING[2]	OFF	test maintenance l
3329 (c)	Any	Serial Link Test (#337)	MINOR/ WARNING[2]	OFF	test maintenance sh r 3
3585 (d)	Any	Serial Link Test (#337)	MINOR/ WARNING[2]	OFF	test maintenance sh r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. A value of 0 indicates the Expansion Link in the A carrier was active when this error occurred. A value of 1 indicates the Expansion Link in the B carrier was active when this error occurred. To clear this problem, make sure the Active Expansion Link is the same as that indicated by the Aux Value.

b. Multiple values can appear in the Aux Data field. There are other errors in the log if there is a real problem. Use these other errors to troubleshoot the problem.

c. The serial link between the Expansion Link in the A carrier and the EPN Maintenance circuit pack is defective.

d. The serial link between the Expansion Link in the B carrier and the EPN Maintenance circuit pack is defective.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Sanity Handshake Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Sanity Handshake Test (#106)	X	X	ND
Network Control Circuit Pack DPR Test (#104) (a)		X	D
EPN Maintenance Circuit Pack Reset Test (#306)		X	D
Serial Channel Local Loop Around Test (#229)	X	X	ND
MGR I Channel Local Loop Around Test (#228)		X	D
EPN Maintenance Circuit Pack Sanity Maze Test (#303)	X	X	ND
EPN Maintenance Circuit Pack Serial Link Test (#337)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. If you are invoking the Long Test Sequence from the EPN Manager I (G1) or G3MT terminal, Test #104 causes the system technician terminal to be logged off, and Test #306 is not run as part of the test sequence. Test #104, however, causes Test #306 to run in an attempt to bring the EPN Maintenance circuit pack back to a known state. After the test sequence runs, the Error Log should be examined for MAINT errors of type 1 and 3073 to determine if the Network Control Circuit Pack DPR Test and EPN Maintenance Circuit Pack Reset Test failed.

If you are invoking the Long Test Sequence from the PPN, all tests listed are run and their results are displayed on the PPN Manager I (G1) or G3MT terminal. The EPN Manager I (G1) or G3MT terminal is still be logged off.

Network Control Circuit Pack Dual Port Ram (DPR) Test (#104)

This test is destructive.

When executed, this test drops the EPN Manager I (G1) or G3MT terminal login. The login prompt reappears if the test passes successfully.

The Dual Port Ram (RAM), memory shared by the TN777 Processor circuit pack and the Network Control circuit pack, is tested to ensure that it can be read from and written to. EPN Maintenance circuit pack maintenance utilizes the DPR on the Network Control circuit pack for placing messages that eventually get passed along to the Expansion Interface circuit pack in the EPN cabinet and subsequently to the EPN Maintenance circuit pack in the EPN cabinet.

Table 11-207. TEST #104 Network Control Circuit Pack Dual Port Ram (DPR) Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
1030	ABORT	Internal System Error.
2028	ABORT	Internal System Error.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
10401	ABORT	Test disabled via software patch. 1. Escalate to next tier level.
	FAIL	The test failed. 1. Since a portion of the Network Control circuit pack (the Dual Port Ram) is actually being tested here, run the Short Test Sequence against the Network Control circuit pack (SW-CTL) and follow the maintenance procedures outlined for Test #325.

Continued on next page

Table 11-207. TEST #104 Network Control Circuit Pack Dual Port Ram (DPR) Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	FAIL	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The communication to the EPN Maintenance circuit pack is good at least up to the Network Control circuit pack. If there are still problems communicating with the EPN Maintenance circuit pack, then these problems must be with either the EXP-LINK (Expansion Links), EXP-INTF (Expansion Interface) circuit pack, or the EPN MAINT (Maintenance) circuit pack.

Sanity Handshake Test (#106)

This test checks the EPN Maintenance circuit pack's ability to respond to queries. A message is sent to the EPN Maintenance circuit pack which then sends a message back. If the response message is received, then the EPN Maintenance circuit pack is queried for the EPN cabinet type (valid EPN cabinet types are single-carrier and multicarrier cabinets). The EPN Maintenance circuit pack reads pins on the backplane of carrier A that identify the type of cabinet and report this information. If a valid cabinet type is returned, then the test passes.

Table 11-208. TEST #106 Sanity Handshake Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to cabinet query was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2046	ABORT	The EPN Maintenance circuit pack reported an invalid cabinet type. Not knowing the cabinet type of the EPN prevents all EPN environment maintenance from running. 1. Retry the command. 2. If the test continues to abort with 2046, then either the EPN Maintenance circuit pack is defective, or the EPN cabinet wiring is defective. First, replace the EPN Maintenance circuit pack. 3. If the test continues to abort with 2046, then the EPN cabinet wiring is defective in the A carrier and the EPN Maintenance circuit pack cannot read the backplane pins to determine the cabinet type.
10601	ABORT	Test disabled via software patch. 1. Escalate to next tier level.

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Table 11-208. TEST #106 Sanity Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	EPN Maintenance circuit pack did not respond to Sanity Handshake and the test timed out. 1. Verify that the carrier A power units are good. If the -5 volt unit is defective in the A carrier, then communication with the EPN Maintenance circuit pack is not possible.

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Table 11-208. TEST #106 Sanity Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	2. If the -5 volt unit is good and this test continuously fails, background maintenance automatically escalates to an EPN Maintenance circuit pack Reset (Test #306). Otherwise, you can manually invoke an EPN Maintenance circuit pack Reset by issuing the **test maintenance long** command and evaluating any generated error codes from Test #306. If Test #306 passes, this test should also PASS. Otherwise, use the following steps to determine if the EPN Maintenance circuit pack, or the serial link to the EPN Maintenance circuit pack, is defective: ■ Duplicated Expansion Links: 1. Determine which serial link is the standby by issuing the **status system** system technician command. 2. Switch Expansion Links by entering **set expansion-link PCSS** where PCSS is the 4-character Expansion Interface circuit pack location for the Standby link. 3. Run the Short Test Sequence against the EPN Maintenance circuit pack. If Test #106 still fails, replace the EPN Maintenance circuit pack and retest. Otherwise, follow the error routines for any errors that are logged by this Short Test. ■ Single Expansion Interface Link Switch: 1. Replace the EPN Maintenance circuit pack and invoke the Short Test Sequence against it. 2. If error persists, replace the EPN Expansion Interface circuit pack, **at a time when the EPN can go down with minimal inconvenience**. 3. If the error still persists, the problem is with the actual serial link in A carrier backplane and not with the EPN Maintenance circuit pack.

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Table 11-208. TEST #106 Sanity Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The communications path to and from the EPN Maintenance circuit pack is sane, and the EPN Maintenance circuit pack can read and report the correct EPN cabinet type. The EPN Maintenance circuit pack may still have problems related to Tests #228, #229, #303, or #306.

MGR I Channel Local Loop Around Test (#228)

This test is destructive.

This test checks the on-board circuitry of the EPN Maintenance circuit pack associated with the serial link for the Manager I (G1) or G3MT connection. This test does not cause the terminal to become disconnected. However, any data being displayed on the Manager I (G1) or G3MT terminal while the test is running is lost. Figure 11-71 shows the three serial interfaces on the EPN Maintenance circuit pack and is meant to clarify that only the one dealing with the EPN Manager I (G1) or G3MT terminal is being tested.

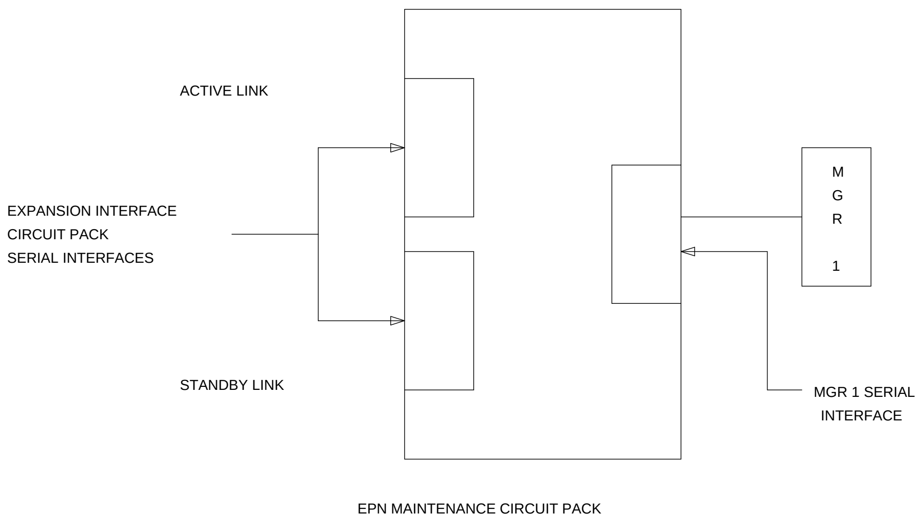

Figure 11-71. EPN Manager I (G1) or G3MT Connection

Table 11-209. TEST #228 MGR I Channel Local Loop Around Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2034	ABORT	Background EPN Maintenance circuit pack maintenance is running the MGR I Channel Local Loop Around Test. 1. Wait 30 seconds and retry the test a maximum of five times. 2. If the test continues to abort, escalate.
22801	ABORT	Test disabled via software patch. 1. Escalate to next tier level.

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Table 11-209. TEST #228 MGR I Channel Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Test failed which means the EPN Manager I (G1) or G3MT terminal is not usable. 1. Run the test three more times. Replace the EPN Maintenance circuit pack if the test continues to fail.
	PASS	The serial interface circuitry on the EPN Maintenance circuit pack which controls the EPN Manager I (G1) or G3MT terminal is functioning properly. If there are still troubles with the EPN Manager I (G1) or G3MT terminal, the problem may be one of the following: 1. The EPN Manager I (G1) or G3MT terminal is not configured properly. The connection between the EPN Manager I (G1) or G3MT and the EPN Maintenance circuit pack must be set up at 9600 baud. 2. The serial link from the back of carrier A to the EPN Manager I (G1) or G3MT terminal may be defective. The serial link consists of the connector on the back of carrier A labeled TERM and the ribbon cable running to the EPN Manager I (G1) or G3MT terminal. 3. The EPN Manager I (G1) or G3MT terminal may be defective. Try another terminal. 4. Since this test is not 100 percent accurate, there may still be problems with the EPN Maintenance circuit pack.

Serial Channel Local Loop Around Test (#229)

This test checks the on-board circuitry of the EPN Maintenance circuit pack associated with the serial links to the Expansion Interface circuit pack. Figure 11-72 shows the three serial interfaces on the EPN Maintenance circuit pack and is meant to clarify that the two dealing with the Expansion Links are being tested. A request is sent to the EPN Maintenance circuit pack over the Active link via the Active Expansion Interface circuit pack serial interface circuitry to test the serial interface circuitry of the standby Expansion Interface circuit pack link. If a response is received, then by definition the serial interface circuitry associated with the Active link is good.

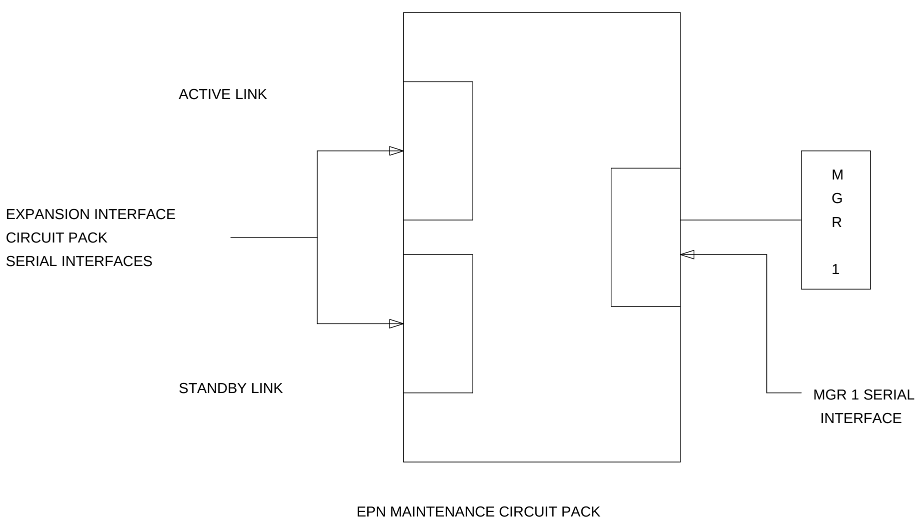

Figure 11-72. EPN Expansion Links Connections

Table 11-210. TEST #229 Serial Channel Local Loop Around Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 11-210. TEST #229 Serial Channel Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2034	ABORT	Background EPN Maintenance circuit pack maintenance is running the Serial Channel Local Loop Around Test. 1. Wait 30 seconds, and retry the test a maximum of five times. 2. If the test continues to abort, escalate the problem.
2290 1	ABORT	Test disabled via software patch. 1. Escalate to the next tier level.

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Table 11-210. TEST #229 Serial Channel Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The on-board circuitry associated with the Standby serial link is defective. Since the EPN Maintenance circuit pack reported this failure, the on-board circuitry associated with the Active serial link is functional. 1. This test checks the circuitry on the EPN Maintenance circuit pack associated with the Standby Expansion Interface link. ■ In a switch without duplicated Expansion Links, current service is not affected because the circuitry failing is not being used. Nevertheless, a Minor alarm remains in the Alarm Log against MAINT. Therefore, the EPN Maintenance circuit pack must be replaced. ■ In a switch with duplicated Expansion Links, service is not affected as long as you DO NOT SWITCH LINKS; otherwise, the connection to the EPN Maintenance circuit pack is lost. Losing the EPN Maintenance circuit pack connection means loss of the EPN Manager I (G1) or G3MT and EPN Environment maintenance. If an Expansion Links switch does occur, the software probably switches the links back, based on the relative health of each link. The EPN Maintenance circuit pack must be replaced to correct this problem.

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Table 11-210. TEST #229 Serial Channel Local Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The on-board circuitry associated with both Expansion Interface circuit pack serial links is good. If there is still a problem communicating with the EPN Maintenance circuit pack, check the following: 1. The cable comprising the serial link (B carrier Expansion Interface circuit pack to EPN Maintenance circuit pack only) may be defective. 2. The EPN Maintenance circuit pack may actually be defective. **NOTE:** This test may not be 100 percent accurate. 3. The Expansion Interface circuit pack on the Standby link may be defective.

EPN Maintenance Circuit Pack Sanity Maze Test (#303)

The EPN Maintenance circuit pack processor has direct access to special registers in the EPN Maintenance circuit pack. These registers are tied to such things as the Expansion Interface circuit pack reset leads and Carrier Port Power Unit reset leads (which enable the EPN Maintenance circuit pack to recycle carriers). To prevent an insane EPN Maintenance circuit pack from inadvertently controlling these external devices, a special interface called the Sanity Maze is provided that must first be navigated by the EPN Maintenance circuit pack processor prior to any register access. There are two parts to the test. Part 1 involves navigating the Sanity Maze to toggle an unused lead. Part 2 attempts to toggle an unused lead without first navigating the Sanity Maze. The Sanity Maze test passes if Part 1 is successful and Part 2 fails.

Table 11-211. TEST #303 EPN Maintenance Circuit Pack Sanity Maze Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Sanity Maze of the EPN Maintenance circuit pack is defective. 1. Replace the EPN Maintenance circuit pack.
	PASS	The Sanity Maze is working properly, and the EPN Maintenance circuit pack can access the unused register. If **recycle carrier** commands (for EPN carriers) do not work, the following problems may still exist: 1. The Carrier Port Power Unit or wiring to the Carrier Port Power Unit may be defective. Refer to CARR-POW (Carrier Port Power Unit) Maintenance documentation. 2. Since this test only tests the EPN, there is a very small probability that the EPN Maintenance circuit pack cannot access those registers that deal with EPN devices. The EPN Maintenance circuit pack may need to be replaced.

EPN Maintenance Circuit Pack Reset Test (#306)

This test is destructive.

The EPN Manager I (G1) or G3MT is dropped and, if the Emergency Transfer switch is in the AUTO position, Emergency Transfer is disabled for the duration of the test.

The EPN Maintenance circuit pack is reset by the Active Expansion Interface circuit pack. After the Expansion Interface circuit pack reports that the EPN Maintenance circuit pack has reset, a handshake message is sent to the EPN Maintenance circuit pack. If the EPN Maintenance circuit pack responds to the handshake, the test passes. If not, it fails. If the test passes, the EPN Manager I (G1) or G3MT is brought back up, and Emergency Transfer is restored to its previous state.

Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	Test disabled via software patch. 1. Escalate to next tier level.
2000	ABORT	Response to the reset request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, look for and resolve all problems associated with the Expansion Interface circuit pack (EXP-INTF). 3. If the test continues to abort, escalate the problem.
2028	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2030	ABORT	EPN is down. 1. Run the Short Test Sequence against the Expansion Interface circuit pack (**test board PCSS**) where PCSS is the 4-character address of the active Expansion Interface circuit pack), and refer to the maintenance procedures outlined for that circuit pack.
2031	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2032	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, replace the EPN Maintenance circuit pack.

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Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Expansion Interface circuit pack could not reset the EPN Maintenance circuit pack. For duplicated Expansion Links in the EPN: 1. The Standby Expansion Interface circuit pack may be defective and, thereby, preventing the Active Expansion Interface circuit pack from resetting the EPN Maintenance circuit pack. Unplug the Standby Expansion Interface circuit pack, and attempt to reset the EPN Maintenance circuit pack using the **test maint long** command. If Test #306 passes, replace the Standby Expansion Interface circuit pack, and attempt the reset test again. If Test #306 fails, then replace the Standby EPN Expansion Interface circuit pack. 2. The Active Expansion Interface circuit pack may be defective and unable to reset the EPN Maintenance circuit pack. To determine which is the Standby link, enter the **status system** command from the Manager I (G1) or G3MT terminal. Switch links by entering the **set expansion-link** command followed by the 4-character Expansion Interface circuit pack location for the Standby link. Now reset the EPN Maintenance circuit pack again by using the **test maintenance long** command. If the test passes, the problem is with the known Standby Expansion Interface circuit pack. Repeat Step 2 to determine if the Standby Expansion Interface circuit pack should be replaced. 3. Replace the EPN Maintenance circuit pack, and run the test again. If the test passes, the problem is with the EPN Maintenance circuit pack. Switch Expansion Links, and run the test again. The test should pass with both Expansion Interface circuit packs being active. 4. If the B carrier Expansion Interface circuit pack is active, the ribbon cable connecting the Expansion Interface circuit pack and the EPN Maintenance circuit pack may be defective. Check the ribbon cable to make sure it is connected properly and is not damaged.

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Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	For single Expansion Links in the EPN: 1. Replace the EPN Maintenance circuit pack, and run the test again. If it passes, the problem is with the EPN Maintenance circuit pack. 2. If the test fails, replace the Expansion Interface circuit pack. If the tests passes, the problem is with the Expansion Interface circuit pack. 3. If the test still fails, the problem is with the serial link wired into the backplane of carrier A.

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Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2005	FAIL	EPN Maintenance Circuit Pack Reset passed, but the EPN Maintenance circuit pack did not respond to subsequent handshake message. Retry this command three more times. If it continues to fail, the EPN Maintenance circuit pack, the Active Expansion Interface circuit pack, or the serial link is defective. To determine which is defective, follow the appropriate procedures that follow. ■ Duplicated Expansion Links: 1. Determine which serial link is the Standby by issuing the **status system** system technician command. 2. Switch Expansion Links by entering **set expansion-link PCSS** where PCSS is the 4-character Expansion Interface circuit pack location for the Standby link. 3. Run the Short Test Sequence against the EPN Maintenance circuit pack. If Test #306 still fails, replace the EPN Maintenance circuit pack and retest. Otherwise, follow the error routines for any errors that are logged by this Short Test Sequence. ■ Single Expansion Interface Link Switch: 1. Replace the EPN Maintenance circuit pack and invoke the Short Test Sequence against it. 2. If the error persists, replace the Expansion Interface circuit pack, **at a time when the EPN can go down with minimal inconvenience**. 3. If the error still persists, the problem is with the actual serial link in A carrier backplane and not with the EPN Maintenance circuit pack.

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Table 11-212. TEST #306 EPN Maintenance Circuit Pack Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Active Expansion Interface circuit pack can reset the EPN Maintenance circuit pack. This implies the EPN Maintenance circuit pack, the Active Expansion Interface circuit pack, and Active serial link are sane. There could still be a problem with the Standby Expansion Interface circuit pack and Standby serial link in a High or Critical Reliability system.

EPN Maintenance Circuit Pack Serial Link Test (#337)

This test is destructive.

This test checks the serial link from the Standby Expansion Interface circuit pack to the EPN Maintenance circuit pack. If there is no Standby link, or the Standby link is down at the time of the test, this test aborts.

NOTE:
The status of the link is changed to "down" when the Standby Expansion Interface circuit pack begins initialization tests (for example, after being reseated). The link status is then updated at the conclusion of these tests.

Table 11-213. TEST #337 EPN Maintenance Circuit Pack Serial Link Test

Error Code	Test Result	Description/ Recommendation
1030	ABORT	The active Expansion Link to the EPN Maintenance circuit pack is not running. 1. Follow up on the test results of the EPN Maintenance Circuit Pack Sanity Handshake Test (#105). 2. When problems associated with this test are resolved, rerun Test #337.
1035	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-213. TEST #337 EPN Maintenance Circuit Pack Serial Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1036	ABORT	There is no Standby Expansion Link running. Either the system only has one Expansion Link, the Standby Expansion Link is down due to Expansion Link, or the Expansion Interface circuit pack problems. 1. Issue the **status system** command and determine if the Standby Expansion Link is down or does not exist. If it does not exist, dashes are shown. Otherwise, the link status is shown. If there is no Standby link, this test always aborts. 2. If there is a Standby link and it is down, then refer to EXP-INTF (Expansion Interface Circuit Pack) Maintenance documentation and resolve all alarms on the link. 3. Rerun the test.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Serial Link between the current Standby Expansion Interface circuit pack and the EPN Maintenance circuit pack is defective. If the Standby link is on the A carrier, errors of type 3329 are logged; however, if the Standby link is on the B carrier, errors of type 3585 are logged. 1. Replace the EPN Maintenance circuit pack. 2. Rerun the test. If the test continues to fail, replace the Standby EPN Expansion Interface circuit pack. 3. Rerun the test. If the test continues to fail and the Standby link is on the B carrier, then replace the ribbon cable that carries the serial link from Expansion Interface circuit pack B to the EPN Maintenance circuit pack. 4. Rerun the test. If the test continues to fail, escalate the problem.
	PASS	The serial link from the Standby Expansion Link to the EPN Maintenance circuit pack is working.

MEM-BD (Memory)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
MEM-BD	MAJOR	test memory l c	Memory
MEM-BD (a)	WARNING	test memory sh c	Memory
MEMORY (b)	MAJOR	test memory a/b sh c	Memory

NOTE:
For memory problems on systems with a TN790 RISC processor circuit pack see maintenance object PR-MEM.

Notes:

a. In a G3iV1.1-286 System only, this alarm occurs when a memory circuit pack of vintage 3 or greater is not used. (Refer to Notes (i) and (j) following the "Hardware Error Log Entries and Test to Clear Values" table for more information.)

b. In 386 systems [G3iV2-386, G3sV2, G3vsV2], memory is on the processor circuit pack and not on a separate memory circuit pack, as it is in a G3iV1.1-286 system. In 386 systems, the maintenance object is "MEMORY" and not "MEM-BD." However, all references to MEM-BD in this section are applicable to "MEMORY" as well.

The Memory contains the DEFINITY software and firmware. The Processor circuit pack is the most critical component of all system operations.[1]

G3iV1.1-286 systems contain two TN770 circuit packs. These circuit packs are separate from the Processor circuit pack. Memory problems may only require the replacement of the bad Memory circuit pack. However, because the circuit packs are interdependent, a Processor circuit pack should be brought to a customer's site along with the Memory circuit packs in case of memory alarms (see Figure 11-73).

386 systems contain memory that is integrated with the processor. For testing purposes, the circuit pack is logically separated into PR-MAINT, PROCR, and MEMORY. This means that a memory problem on 386 systems requires that the Processor be replaced (see Figure 11-73). 386 systems contain two types of memory: Flash ROM and DRAM. Flash ROM is permanent memory that contains the boot image, PI firmware, and PACCON firmware. This type of memory is not erased during circuit pack resets. It can be reprogrammed only via the **upgrade software** command.

1. An R1V4 DEFINITY system has all its Memory on a single TN770 circuit pack, while an R1V5 system and a G3iV1.1-286 system use two such packs for Memory. A DEFINITY 386 system has all its Memory on the Processor circuit pack (TN786B). In addition, G3iV2-386 has expansion memory on a CPP1.

DRAM is used for software data storage, and it changes constantly. DRAM loses its value during circuit pack resets. Both types of memory are present on the Processor circuit pack. The diagnostics run appropriate tests on both memories.

For all system activity, the Processor must be able to access the Memory. If the Processor cannot do this, the system goes into SPE-down mode. In SPE-down mode, fatal Memory errors may show up as Processor errors. This merely indicates that the Processor and the Memory are very closely linked as a matter of course.

If the initialization diagnostics fail, refer to the "Procedure for SPE-Down Mode" section in Chapter 4, "Initialization and Recovery".

In G3iV1.1-286, the faulty Memory circuit pack is identified in the Alt Name field on the Alarm Report Form and on the Hardware Error Report Form. A "1" in the Alt Name field refers to the Processor circuit pack, a "2" refers to the Memory, and a blank refers to both circuit packs.

In G3s/vs/ iV2-386, memory faults usually indict the CPP1 circuit pack, however the problem may be on the TN786B.

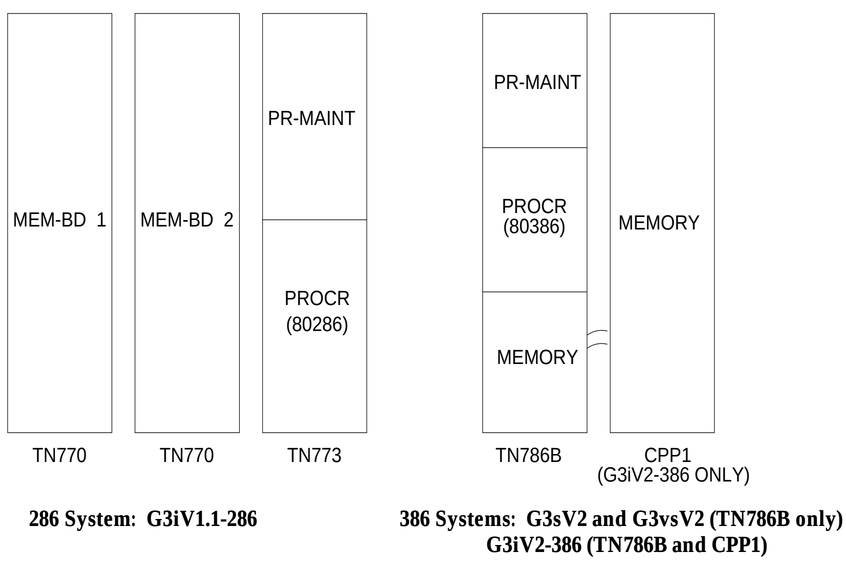

Figure 11-73. Configurations for 286 and 386 Systems

Hardware Error Log Entries and Test to Clear Values

Memory Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test memory a/b l r 1
1-256	Any	Read All Memory Test (#85)	MAJOR	ON	test memory a/b l r 5
257-512 (b)	Any	Read All Memory Test (#85)	MAJOR	ON	test memory a/b l r 1
513 (c)	0	Memory Detection/ Test (#87)	MAJOR	ON	test memory a/b r 3
769 (d)	Any	Text Checksum Test (#86)	MAJOR	OFF/ON	test memory a/b l r 2
1025 (e)	Any	Memory Functional Test (#332)	MAJOR	ON	test memory a/b l r 1
1537-1792 (f)	Any	Read All Memory (#85)	MAJOR	ON	test memory a/b l r 5
1793-2048 (g)	Any	Read All Memory (#85)	MAJOR	ON	test memory a/b l r 1
2049 (h)	0	Memory Error Detection/ Test(#87)	MAJOR	ON	test memory a/b r 3
2817 (i)	Any	Memory Board Check(#631)	WARNING	ON	test memory a/b sh

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The "clear" option can replace the "repeat" option in a **test memory** command. For a High or Critical Reliability system, the carrier (a or b) must be specified. In all other systems, there is no need to specify the carrier.

b. The Read All Memory Test (#85) failed. Refer to the FAIL section of this test. For G3iV1.1-286, the error is associated with MEM-BD 1. For all other systems, no such association is made.

c. The Memory Error Detection Test (#87) failed. Refer to the FAIL section of this test. For G3iV1.1-286, the error is associated with MEM-BD 1. For all other systems, no such association is made.

d. The Text Checksum Test (#86) failed. Refer to the FAIL section of this test. For G3iV1.1-286, the error is associated with MEM-BD 1 and is an OFF board alarm. In 386 systems, the alarm is ON board.

e. There are Functional Test errors against both the Processor circuit pack and Memory. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a **reset system 4** command or a **reset system 5** command.

f. These errors apply only to G3iV1.1-286 systems.

g. The Read ALL Memory Test (#85) failed. Refer to the FAIL section of this test. These error types apply only to MEM-BD 2 (G3iV1.1-286 systems only).

h. The Memory Error Detection (#87) failed. Refer to the FAIL section of this test. These error types apply only to MEM-BD 2 (G3iV1.1-286 systems only).

i. For G3iV1.1-286 systems only, the test is failing because the circuit pack for MEM-BD 2 is not of vintage 3 or greater. Replace the pack with one of vintage 3 or greater.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate errors in the order in which they are presented in the table that follows when you are inspecting errors in the system. By clearing error codes associated with the *Read All Memory Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Non-maskable Interrupt Test (#82)(a)	X	X	ND
Processor ROM Checksum Test (#80) (a)	X	X	ND
Processor Software Initiated Interrupt Test (#77) (a)	X	X	ND
Processor Sanity Timer Test (#83) (a)		X	D
MTP Outpulse Relay Test (#102) (b)	X	X	ND
MTP Analog Loop Around Test (#103) (b)	X	X	ND
MTP Sanity Handshake Test (#106) (b)	X	X	ND
MTPSAT Loop Around Test (#228) (b)	X	X	ND
MTP Aux Loop Around Test (#229) (b)	X	X	ND
MTP Reset Test (#101) (b)		X	D
MTP Dual Port Ram Test (#104) (b)		X	D
Read All Memory Test (#85)		X	ND
Memory Error Detection Test (#87)	X	X	ND
Text Checksum Test (#86)		X	ND
Memory Functional Test (#332) (c)		X	D
Memory Board Check Test (#631)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to PROCR (Processor) Maintenance documentation for a description of these tests [386 systems only].

b. Refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation for a description of these tests [386 systems only].

c. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a **reset system 4** command or a **reset system 5** command.

Read All Memory Test (#85)

This test is a nondestructive test. The test reads every memory location in memory and writes it back. A failure of this test indicates a failure in the Processor or Memory circuit pack.

Table 11-214. TEST #85 Read All Memory Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-214. TEST #85 Read All Memory Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	If the system can still provide service, this indicates that the Processor circuit pack or Memory has a problem, but can still function. The error code "1" indicates that MEM-BD 1 is failing the test. 1. In a 386 system, the PROCR (Processor circuit pack TN786B) should be replaced. If the test continues to fail, escalate the problem. **WARNING:** *If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.* 2. In a G3iV1.1-286 system, the MEM-BD 1 (Memory circuit pack 1 TN770) should be replaced. If the test still fails, the original MEM-BD 1 (TN770 Memory circuit pack 1) should be reinserted, and MEM-BD 2 (TN770 Memory circuit pack 2) should be replaced. If the test still fails, the original MEM-BD 2 (Memory circuit pack 2) should be reinserted and the PROCR (Processor circuit pack) should be replaced with a new one. If the test still continues to fail after you replace the Memory and Processor circuit packs, escalate the problem.

Continued on next page

Table 11-214. TEST #85 Read All Memory Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	If the system can still provide service, this indicates that the Processor circuit pack or Memory has a problem, but can still function. For G3iV1.1-286, the Error Code 2 indicates that MEM-BD 2 is failing the test. 1. In 386 systems, you do not get this error. Therefore, you should escalate the problem. 2. In G3iV1.1-286, the MEM-BD 2 (TN770 Memory circuit pack 2) should be replaced. If the test still fails, the original MEM-BD 2 (Memory circuit pack 2) should be reinserted, and MEM-BD 1 (TN770 Memory circuit pack 1) should be replaced. If the test still fails, the original MEM-BD 1 (Memory circuit pack 1) should be reinserted, and the PROCR (Processor circuit pack) should be replaced with a new one. If the test still continues to fail after you replace the Memory and Processor circuit packs, escalate the problem.
	PASS	The Memory is healthy.

Text Checksum Test (#86)

This test is a nondestructive test. In G3iV1.1-286, the test computes the checksum of the DEFINITY Generic 3 software text module. A failure of this test indicates corruption of the RAM. However, this failure does NOT indicate a hardware problem. **DO NOT REPLACE** the Memory circuit pack when this is the only error. However, if there are other Memory alarms, follow the maintenance procedures described in Tests #85 and #87. A system restart via the **reset system 4** command and with good tapes in the system should be implemented at the customer's earliest convenience. In a High or Critical Reliability system, an **upgrade software** command can be used with good tapes in the system. This command performs the same operation as the **reset system 4** command but is much less service-disruptive.

In 386 systems, the test computes the checksum of the DEFINITY Generic 3 software text module, and it validates the operation of the flash ROM. A failure of this test indicates corruption of the Text.

Table 11-215. TEST #86 Text Checksum Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
	FAIL	The system may or may not continue to operate correctly. The system may fail later when some action requires access to the corrupted area of the Text. 1. For G3iV1.1-286, the system should be restarted via the **reset set system 4** command. If the test continues to fail, the original PROCR (Processor circuit pack) should be reinserted, and the Memory should be replaced with a pack. If the test continues to fail, escalate the problem. If escalation does not solve the problem, a hardware problem exists, and the PROCR (Processor circuit pack) must be replaced. If the problem still persists, replace the Memory. If the test continues to fail, escalate the problem. Refer to the "Handling Control Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures", for a Standard system and to the "Repair Procedures for High and Critical Reliability" section in Chapter 8, "Reliability Systems: A Maintenance Aid", for a High or Critical Reliability system. 2. For a 386 system, the flash ROM should be reprogrammed via the **upgrade software** command. The memory card should contain the same vintage software that is currently in the system. Refer to the "Software Upgrade" section in Chapter 5, "Routine Maintenance Procedures". If the test continues to fail, escalate the problem.

Continued on next page

Table 11-215. TEST #86 Text Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2058	FAIL	**(G3iV1.1-286 system only)**. This test has two parts: a checksum of the text module only and a checksum of the initialized data. The latter is performed only on a **reset system 4** or on a **reset system 5**. 1. If Error Type 769 with an Aux Data value of 2058 occurs immediately after **reset system 4**, and if the test later passes, the checksum of the initialized data probably failed. The alarm is resolved immediately, and the system may function normally. Also, the tape may have a bad boot image on it. (There is no way to verify this except by performing a level 4 system reset.) If the system continues to operate correctly, replace the tape and save the translations. Otherwise, perform a **reset system 4** at the customer's earliest convenience after you replace the tape and save the translations. In a High or Critical Reliability system, the **upgrade software** command should be used instead of the **reset system 4** command.
	PASS	The checksum is correct.

Memory Error Detection Test (#87)

This test is a nondestructive test. In G3iV1.1-286 systems only, the test determines if the error correction circuitry on the Memory circuit packs is working. Accordingly, the test determines if single- and multiple-bit errors can be detected. Single-bit errors can be corrected.

The test is run on a few reserved locations in memory. A failure of this test indicates a failure in the Memory or Processor circuit packs.

In 386 systems only, this test determines if the parity circuitry is working. Accordingly, the test determines if parity errors can be detected. The parity circuitry is used to detect DRAM memory failures.

Table 11-216. TEST #87 Memory Error Detection Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-216. TEST #87 Memory Error Detection Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The parity detection circuitry is not working correctly. If the system can still provide service, this indicates that the Processor circuit pack or Memory has a problem but can still function. Error Code 1 indicates that MEM-BD 1 is failing the test. 1. In 386 systems, the PROCR (Processor circuit pack TN786B) should be replaced. The failure is identifying the PROCR as being bad and only the PROCR circuit pack needs to be replaced. If the test still fails, the original PROCR circuit pack should be reinserted, and the CPP1 should be replaced. If the test continues to fail, replace the PROCR and CPP1 circuit packs. If the test still continues to fail after you replace both the PROCR and CPP1 circuit packs, escalate the problem. **WARNING:** *If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.* 2. In G3iV1.1-286, the MEM-BD 1 (Memory circuit pack 1 TN770) should be replaced. If the test still fails, the original MEM-BD 1 (TN770 Memory circuit pack 1) should be reinserted, and MEM-BD 2 (TN770 Memory circuit pack 2) should be replaced. If the test still fails, the original MEM-BD 2 (Memory circuit pack 2) should be reinserted and the PROCR (Processor circuit pack) should be replaced with a new one. If the test still continues to fail after you replace the Memory and Processor circuit packs, escalate the problem.

Continued on next page

Table 11-216. TEST #87 Memory Error Detection Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The parity detection circuitry is not working correctly. If the system can still provide service, this indicates that the Processor circuit pack or Memory has a problem but can still function. The Error Code 2 indicates that MEM-BD 2 is failing the test. 1. In a 386 system, the Processor circuit pack TN786B should be replaced. The failure is identifying the CPP1 as a "bad" circuit pack and, consequently, only the CPP1 needs to be replaced. If the test still fails, the original CPP1 should be reinserted, and the PROCR circuit pack should be replaced. If the test continues to fail, replace both the PROCR and CPP1 circuit packs. If the test still continues to fail after you replace both the PROCR and CPP1 circuit packs, escalate the problem. 2. In G3iV1.1-286, the MEM-BD 2 (TN770 Memory circuit pack 2) should be replaced. If the test still fails, the original MEM-BD 2 (Memory circuit pack 2) should be reinserted, and MEM-BD 1 (TN770 Memory circuit pack 1) should be replaced. If the test still fails, the original MEM-BD 1 (Memory circuit pack 1) should be reinserted, and the PROCR (Processor circuit pack) should be replaced with a new one. If the test still continues to fail after you replace the Memory and Processor circuit packs, escalate the problem.
	PASS	The parity detection circuitry is working.

Memory Functional Test (#332)

This test is destructive.

In G3iV1.1-286, this test ensures that each memory location can be changed independently of all other locations. Running this test wipes out any data in memory. This test is performed during a **reset system 4** command or a **reset system 5** command. Refer to the "Procedure for SPE-Down Mode" section of Chapter 4, "Initialization and Recovery", for the recommended maintenance strategy. The system cannot always isolate a fault to a specific Memory circuit pack in a system with two Memory circuit packs. The red LED on both packs is lit if the test fails. Replacing a Memory or Processor circuit pack in a Standard system first requires that the system be brought down. Thereafter, a **reset system 4** or a **reset system 5** must be performed. In a High or Critical Reliability system, it is not necessary to power down when you are replacing a control circuit pack in the Standby SPE. The health of the new circuit pack should be verified by issuing the **test memory long** command.

In 386 systems, this test ensures that every DRAM memory location can be accessed and changed independently. Running this test wipes out all data in DRAM memory. This test is performed during a **reset system 4** or **reset system 5**. If the test fails during a **reset system** command, refer to the "Procedure for SPE-Down Mode" section of Chapter 4, "Initialization and Recovery", for the recommended maintenance strategy.

Table 11-217. TEST #332 Memory Functional Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of three times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-217. TEST #332 Memory Functional Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Standby SPE Memory is defective. 1. Repeat the command at one minute intervals a maximum of five times. 2. For G3iV1.1-286, if the red LEDs on both the Processor circuit pack and the Memory are on during the test, replace the Processor circuit pack. If the test still shows a failure, the original Processor circuit pack should be reinserted, and the Memory should be replaced. For all 386 systems, the Processor circuit pack should be replaced. 3. If the test continues to fail, escalate the problem.
	PASS	The Standby SPE Memory circuit pack(s) is healthy.

Memory Board Check Test (#631)

This test is a nondestructive test. The test checks the vintage of the second memory circuit pack in G3iV1.1-286. The test verifies that the circuit pack is of vintage 3 or greater. The test PASSES if the circuit pack is of vintage 3 or greater. The test FAILS and raises a WARNING alarm if the circuit pack is not of vintage 3 or greater.

NOTE:
This test always passes for a 386 system.

Table 11-218. TEST #631 Memory Board Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Errors. 1. Retry the command at 1 minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2	FAIL	Memory 2 circuit pack must be of vintage 3 or greater. 1. Replace the circuit pack with a pack of vintage 3 or greater.
	PASS	Memory 2 circuit pack is of vintage 3 or greater.

MEMORY

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
MEMORY	MAJOR	test memory a/b l c	memory

Refer to MEM-BD (Memory Circuit Pack) Maintenance documentation for circuit pack level errors.

MET-BD (MET Line Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
MET-BD	MIN	test board PCSS sh	MET Line Circuit Pack
MET-BD	WRN	test board PCSS sh	MET Line Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also MET-LINE (MET Line) Maintenance documentation for related line information.

MET-LINE (MET Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
MET-LINE	MINOR	test port PCSSpp l	MET Line
MET-LINE	WARNING	test port PCSSpp sh	MET Line

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

Electronic Station is the user-friendly term to denote the MET (Multibutton Electronic Telephone) Station Set. The MET sets were originally introduced for use in earlier PBX systems but can now be used in Generic 1 switches.

The TN735 MET Line circuit pack supports four of these Multifunctional Electronic Sets. Each MET set uses three pairs of wires: an analog voice pair, a transmit pair, and a receive pair. Power is sent over the transmit and receive pairs. The MET Line circuit pack supports all 10-, 20-, and 30-button sets.

MET Line interactions are shown in Figure 11-74.

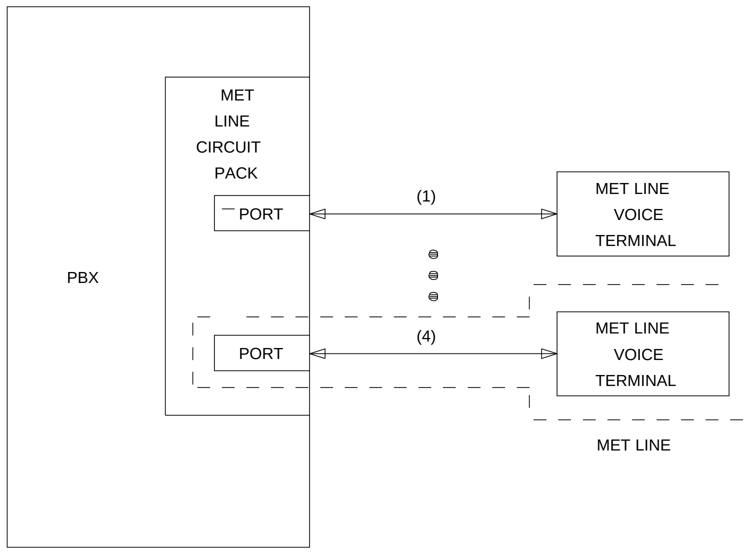

Figure 11-74. MET Line Interactions

A change in the use of the Recall button on the MET set needs to be noted. Instead of being used as it was in earlier PBX systems, the Recall button is used in this system as a self-test button and, when pressed, lights all of the lamps on the MET set and runs the ringer update.

This section refers only to the MET-LINE (MET Line) maintenance that is performed. Note that MET-LINE (MET Line) maintenance is closely related to, and interacts with, the MET-BD (MET Line circuit pack) maintenance in some instances. Some of the results of maintenance testing of the MET Line may be affected by the health of the MET Line circuit pack. This interaction should be kept in mind when investigating the cause of reports of MET Line problems.

There are instances in this section where service states of a station are mentioned. It is helpful to understand what is meant by the different service states that may exist. An explanation of these service states follows:

- Out-of-Service—The port, and thus the station, have been removed from service. A busyout of a port causes it to be out-of-service.
- Ready-for-Service—Once a port on the circuit pack has been put into service, the voice terminal must communicate that it is present. The time between these two events is the time when the terminal is in the ready-for-service state.

- In Service—Once the system receives a message from the voice terminal communicating that it is present, the station is put into the in-service state. The terminal can also be forced into the in-service state if it goes off-hook while it is in the ready-for-service state.

When the **status station** command has been run, and the status screen appears, the status is reported as either out-of-service, in-service (as stated in the preceding list), or disconnect (the station is in the ready-for-service state).

Hardware Error Log Entries and Test to Clear Values

MET Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40987	None			
18 (b)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
130 (c)		None	WARNING	ON	test port PCSSpp sh
257 (d)	40988	None	MIN/WRN[2]	OFF	
513 (e)	40965	Hybrid Line Station Audits Test (#61)	WARNING	OFF	test port PCSSpp sh r 4
769		Port Diagnostic Test (#35)	MIN/WRN[2]	ON	test port PCSSpp l r 3
1025		Hybrid & Conf. Circuits Test (#57)	MIN/WRN[2]	ON	test port PCSSpp l r 3
1537 (f)	40968	None	MIN/WRN[2]	OFF	
1793		TDMNPE Crosstalk Test (#6)	MIN/WRN[2]	ON	test port PCSSpp l r 3
2049(g)	32770				
2049(h)	40967				
3840(i)	40989				

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major or Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a. Indicates a defective data link. An off-board problem detected by port circuit. Make sure the MET set is connected, and that the EPF test passes. If data transmission problems are experienced, check for defective wiring, check for a defective voice terminal, and move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired due to the passing of time.

b. This error is logged when the port in question is busied out by maintenance personnel. Make sure port is released from busyout.

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. This indicates that the EPF has been turned off due to the overcurrent condition at the voice terminal. Check for defective wiring, check for a damaged jack, and make sure the voice terminal is a MET set. Once the problem has been resolved, the alarm is retired due to the passing of time.

e. The particular station audit that causes this error type to be produced is the EPF inquiry audit. If the EPF inquiry receives an "epf-no-load" message a certain number of times, this error occurs and, if the EPF inquiry receives an "epf-on-ok" or an "epf-off-ok" message, it contributes to the resolution of this alarm.

   This indicates that the voice terminal has probably been disconnected or that there is a problem in the wiring to the terminal. Make sure that the voice terminal is connected or check for defective wiring to the voice terminal.

f. This indicates that something is wrong with the link to the voice terminal. An in-line maintenance error has generated an off-board Minor alarm. Ignore if there are no complaints. Otherwise, verify that the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack.

g. This indicates that the station went off-hook while it was in the ready-for-service state. Use the **status system** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No action is necessary.

h. This is the code that is generated when the link between the circuit pack and the voice terminal is successfully reset. No action is necessary.

i. An uplink message being logged that the EPF is one with no load on it. No action is necessary.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Port Diagnostic Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Port Diagnostic Test (#35)		X	ND
MFAT Electronic Power Feed Test (#56)		X	ND
Hybrid Circuit and Conference Circuit Test (#57)		X	ND
Station Lamp Update Test (#60)	X	X	ND
Station Audits Test (#61)	X	X	ND
Ringer Update Test (#62)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-219. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-219. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-219. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via administration. This only applies to analog stations. The default for this field is 'y,' so you may want to determine why it has been turned off on this station. 1. To enable the test for the particular analog station being tested, enter the **change station extension** command and change the 'Test' field on the 'Station' form from 'n' to 'y.'
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-219. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

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Table 11-219. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

Port Diagnostic Test (#35)

This test checks a port's battery feed circuitry. The battery feed circuitry is tested for proper battery voltage by testing the switchhook state. In response to the test message, the on-board firmware terminates the line and checks for switch-hook presence. The termination is then removed, and a check is made for no switch-hook presence. The MET set must be on-hook for the test to execute.

Table 11-220. TEST #35 Port Diagnostic Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-220. TEST #35 Port Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (See Chapter 10, "Maintenance Commands and Trouble-Clearing Aids", for a full description of all possible states.) You must wait until the port is idle before retesting. **NOTE:** The battery feed circuitry is tested for proper battery voltage by testing the switchhook state. In response to the test message, the on-board firmware terminates the line and checks for switch-hook presence. The termination is then removed, and a check is made for no switch-hook presence. The MET set must be on-hook for the test to execute. 1. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1018	ABORT	Test disabled via software patch. 1. Escalate to next tier level.
2000	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-220. TEST #35 Port Diagnostic Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Battery Feed Test failed. This port is out-of-service. 1. Other ports on this circuit pack are not affected. Place user on a different port, if available, until a replacement circuit pack can be obtained. 2. Replace circuit pack when available.
	PASS	Battery Feed Test passed. Current flow is properly detected for this port. 1. If users are reporting problems, examine connections to the port. 2. Escalate the problem.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MET Electronic Power Feed (#56)

In this test, the software requests that the EPF be turned on for a given port. An attempt is made to turn on the power unit to the station. If no current is being drawn, this probably indicates that the station is not connected. If an overcurrent condition is sensed (that is, too much current is being drawn), this may indicate a short in the loop or a defective voice terminal. Depending on what condition is sensed, a message is returned stating that either the EPF was turned on successfully with no problems or that an overcurrent condition is sensed. This test is repeated once more five seconds later. If either test is not successful, the test aborts.

Although this test will never actually return a fail result (except for the internal system error), an error type 257 entry will be made in the error log when the test has completed if the overcurrent case is detected by the hardware.

Table 11-221. TEST #56 MET Electronic Power Feed Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The test was aborted due to an internal system error on a software request to the board. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-221. TEST #56 MET Electronic Power Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The test failed with an internal error while it was attempting to turn on the EPF. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	EAF Test passed. The message to turn on the power to the station was successfully sent to the port. 1. Although this test never returns a FAIL result, after running this test, the Error Log should be checked for any entries with Error Type 257 to examine the real results of this test. 2. If Error Type 257 does not appear in the Error Log within 10 seconds after completion of this test, it is safe to assume that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station, if available, and check that all the feature buttons are operating. 3. If Error Type 257 appears in the Error Log, this indicates some problem with the power to the station. The system technician should check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.

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Table 11-221. TEST #56 MET Electronic Power Feed Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MET Circuit and Conference Circuit Test (#57)

The MET Circuit Test checks the amount of reflection from the MET loop around circuitry and a Conference Test. The Tone-Clock circuit pack places a 1004-Hz tone on a time slot that the port circuit is listening on. A General Purpose Tone Detector (GPTD) is connected to another time slot that the same port circuit is talking on. The on-board microprocessor places the port in the loop around mode and the GPTD measures the level of the reflected signal.

The Conference Test is performed after the Circuit Test. The Conference Circuit Test verifies that the NPE is able to listen to several test tones and correctly conference them together, and the test is executed in two parts. The first half of the test checks the operation of the NPE's first three conference channels. The NPE is put in the loop around mode and instructed to talk on a selected time slot and to listen to the 1004-Hz tone using the first three conference channels. The signal level and noise level of the conferenced output are then measured using a GPTD and checked to verify that they are within an acceptable range.

The second half of the Conference Test checks the operation of the NPE's remaining four conference channels and follows the same procedure as above.

Table 11-222. TEST #57 MET Circuit and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-222. TEST #57 MET Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test were not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-222. TEST #57 MET Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-222. TEST #57 MET Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2103	ABORT	The system could not make the conference connection for the test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
7	FAIL	The conference circuit test failed. The conference circuit test is performed only if the hybrid test passes. The conference circuit test verifies that the network processing element (NPE) is able to correctly conference several test tones together. The test is executed in two parts. The first half of the test verifies the operation of the NPE's first three conference channels, while the second half verifies the NPE's remaining four conference channels. The test puts the NPE in loop around mode and instructs it to talk on a specified time slot while listening to a 1004 Hz tone, using the conference channels. A GPTD then measures the signal and noise levels of the conferenced output and reports whether or not these are within an acceptable range. The failure may be due to off-board circumstances, the most common of which is an off-hook occurring during the test. It is possible that the port may still be functional from a user's point of view. Also, check the error logs against the GPTD-BD, the TONE-BD, and the TONE-PT. 1. This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. 2. Then, issue the **display port** and the **station status** commands to determine if the station is idle. If it is idle, issue the **test port** command for this port. 3. If test continues to fail, issue the **busyout port** and the **release port** commands, and then retest the port.

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Table 11-222. TEST #57 MET Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
57	FAIL	Hybrid Circuit Test failed. This could result in noisy or bad connections. 1. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack, using **test board PCSS short** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the MET Line circuit pack. **NOTE:** If the MET Circuit and Conference Circuit Test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain either a TN736 or a TN752 power unit circuit pack OR a 631DB AC power unit, **but not both types of power units.** To investigate problems with a 631DB power unit, refer to CARR-POW (Carrier Port Power Unit for AC-Powered Systems) Maintenance documentation. To investigate problems with a 645B power unit, refer to CARR-POW (Carrier Port Power Unit for DC-Powered Systems) Maintenance documentation.
	PASS	Hybrid Circuit and Conference Circuit Test passed. The hybrid circuitry is transmitting properly. 1. If complaints still exist, investigate by using other port tests, and by examining the station, wiring, and connections.

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Table 11-222. TEST #57 MET Circuit and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MET Line Station Lamp Updates Test (#60)

For this test, the software lights the lamps on the terminal based on the status record contained in the processor. The lamp updates run only if the station is in-service.

Table 11-223. TEST #60 MET Line Station Lamp Updates Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
2	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
3	ABORT	Station is in ready-for-service or out-of-service state. This may be due to wiring or an unplugged or defective set. 1. Make sure terminal is connected and the wiring is correct. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-223. TEST #60 MET Line Station Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	MET Line Station Lamp Updates completed successfully. 1. If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.

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Table 11-223. TEST #60 MET Line Station Lamp Updates Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MET Line Station Audits Test (#61)

This is a series of three tests that are classified as audits. These audits abort if attempted on an out-of-service station. The tests are as follows:

- Switchhook Audit—This is an update of the SPE records according to the circuit packs' records.
- Bad Scan Inquiry—A message is sent uplink that contains a count that is generated due to certain events relating to the link conditions. This is an indication of data transmission problems between the MET Line circuit pack and the voice terminal.
- EPF Inquiry—The status of the EPF is sent uplink. Possible conditions are: EPF-on-ok, EPF-off, EPF-no-load, and EPF-on-overcurrent.

Although this test will never actually return a fail result (except for the internal system error), it is possible that it will enter error types 257 (over current) or 513 (open circuit) into the error log. To determine if there are any problems that do not show up in the test result, look for these error types in the error log. If these errors appear in the error log or if user complaints still exist, investigate by using other circuit pack tests and by examining the station, the wiring, and the connections.

Table 11-224. TEST #61 MET Line Station Audits Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
1	ABORT	The test was aborted due to an internal system error during the switchhook audit.
2		The test was aborted due to an internal system error during the bad scan inquiry.
3		The test was aborted due to an internal system error during the EPF audit inquiry. 1. Make sure that the station is not in an out-of-service state. 2. Retry the command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-224. TEST #61 MET Line Station Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-224. TEST #61 MET Line Station Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	The test failed due to an internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	Hybrid Line Station Audits passed. 1. Although this test always returns a PASS result, it may enter Error Types 257 or 513 into the Error Log. To determine if there are any problems that don't show up in the test result, look for these error types in the Error Log. 2. If these errors appear in the Error Log, or if user complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MET Line Ringer Update Test (#62)

In this update, a "ringer on" or a "ringer off" message is sent to the firmware to start and stop the ringer on the set.

Table 11-225. TEST #62 MET Line Ringer Update Test

Error Code	Test Result	Description/ Recommendation
3	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. 2. Make sure that the terminal is connected. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 1. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-225. TEST #62 MET Line Ringer Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Hybrid Station Ringer Update passed. 1. If complaints still exist, investigate using other circuit pack tests, and by examining the terminal, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

MIS (Management Information System)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
MIS	WRN	release mis	Management Information System

The Management Information System (MIS)/Call Management System (CMS) MO is used only for administering MIS translations, such as trunks and stations. There are no hardware failures associated with this MO (see Note).

NOTE:
To diagnose MIS link hardware errors and alarms, see PI-LINK (Processor Interface Link) and PI-SCI (System Communication Interface) Maintenance documentation.

The MIS/CMS is an adjunct processor that collects ACD data sent from the switch. In order to change MIS translations, a switch administrator must first enter a **busyout mis** command at the Manager I (G1) or G3MT terminal. When the MIS is busied out, the switch stops sending ACD data to the MIS, and a Warning alarm is raised.

When the switch administrator is finished, a **release mis** command should be entered at the Manager I (G1) or G3MT terminal. This clears the Warning alarm and allows the switch to send ACD data to the MIS.

Hardware Error Log Entries and Test to Clear Values

Management Information System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	release mis
18(a)	0	busyout mis	WARNING	ON	release mis

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. When the **busyout MIS** command is issued, no data is sent to the MIS/CMS regardless of the link state. To allow data to be sent to MIS/CMS, a **release mis** command must be issued from the terminal.

MODEM-BD (Modem Pool Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
MODEM-BD	MIN	test board PCSS sh	Modem Pool Circuit Pack
MODEM-BD	WRN	test board PCSS sh	Modem Pool Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also MODEM-PT (Modem Pool Port) Maintenance documentation for related port information.

MODEM-PT (Modem Pool Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
MODEM-PT	MINOR	test port PCSSpp sh	Modem Pool Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The Modem Pool Port provides an interface for digital and analog data communication devices or ports connected to the PBX. It may be thought of as a PBX data communications "conversion resource" because it converts analog modem signals typically used in the telephone network into digital signals that are compatible with the internal PBX network and vice versa.

There may be a number of these conversion resources available in the PBX, each assigned to one of five available Modem Pool Groups. Only one conversion resource is used per data connection. The PBX software usually adds the conversion resource into a data connection if it determines that it is necessary for the call. Typical connections that include Modem Pool conversion resources include data calls from Analog Line or Central Office Trunk ports to any digital port or Digital Line or Trunk ports to any analog port. An example of a Data Module to Central Office Trunk connection using a Modem Pool conversion resource is shown in Figure 11-75. When a local data call originates from an analog port normally used for voice service only and terminates on a digital port, a Data Origination access code must be dialed before the extension number for the Modem Pool conversion resource to be included in the connection.

Refer to Figure 11-75 on page 11-1111 while reading the following paragraph.

Each Modem Pool conversion resource contains two ports. One of these, an Analog Line Port, is connected (via the PBX network) to the Analog Line or Central Office Trunk Port that is the source of the modem signal. The second port is referred to as the digital port and is connected (again through the PBX network) to the Digital Line or Trunk port associated with the Data Module in the connection. The analog modem signals enter the analog port of the conversion resource in standard Pulse Code Modulation (PCM) format but are converted into Data Communications Protocol (DCP) format before going to the Digital Line or trunk in the connection.

There are two primary types of Modem Pool conversion resources available: an Integrated Pooled Modem and a Combined Modem Pool. The integrated TN758 Pooled Modem circuit pack contains two independent 300 or 1200 baud conversion resources. Each conversion resource contains two interfaces to the

PBX digital network: an analog port and a digital port. The analog port is connected through the PBX network to the analog line or trunk port containing the analog modem signals. The digital port connects through the PBX network to the digital line or trunk port in the call. Figure 11-75 shows a typical end-to-end connection using a conversion resource on the integrated Pooled Modem circuit pack.

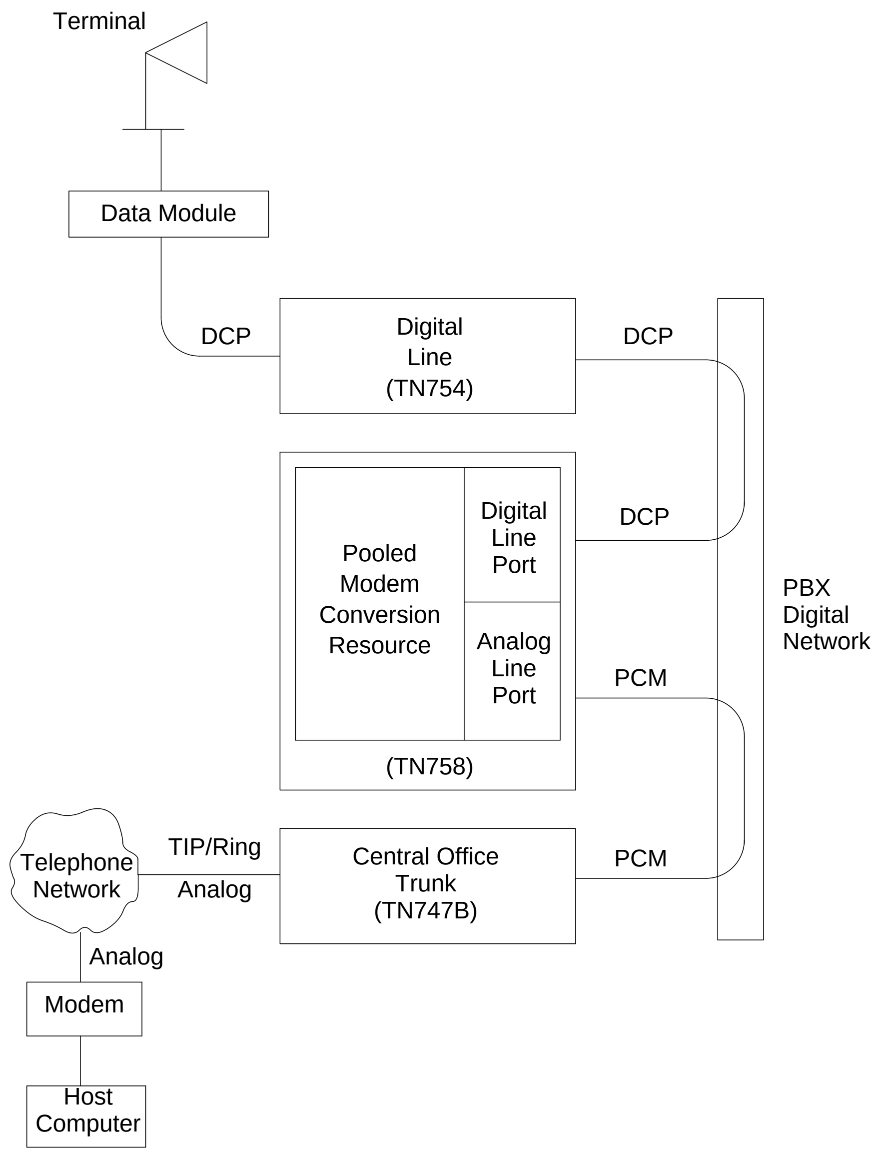

Figure 11-75. Typical Modem Pool Switched Connection with Integrated Pooled Modem

The Combined Modem Pool conversion resource is the second type available. The function served by the Combined Modem Pool is similar to that of the integrated Pooled Modem circuit pack, but the physical implementation is much different. It has the advantage of supporting any speed the external modem can support. The integrated Pooled Modem circuit pack can only support 300 or 1200 baud transmission rates. The Combined Modem Pool conversion resource consists of a port on a TN742 or TN746 Analog Line circuit pack, an external modem, a Data Module, and a port on a TN754 Digital Line circuit pack. The tip and ring interface of the Analog Line is connected to the modem, the EIA 232C interface of the modem connects to the Data Module, and the DCP interface on the Data Module is connected to the Digital Line port.

The analog modem signals pass through the Analog Line port to the modem. The modem converts these to EIA 232C signals which are passed on to the Data Module. The Data Module further converts the signals to the DCP protocol for the Digital Line port which passes the signals on to the PBX network. See Figure 11-76.

Certain customer-reported troubles may provide important information for troubleshooting Modem Pool problems. For example, if the customer tries to make a data call requiring a Modem Pool conversion resource, and the Modem Pool and Data Module speeds or other options don't match, they receive a "CHECK OPTIONS" error message on the terminal. If this happens, the Modem Pool administration and customer Data Module option settings should be checked. In addition, if the Modem Pool is a Combined type, option settings should be checked on the external Modem and Data Module making up the Combined Modem Pool. The cabling and connections between the Digital Line port, Data Module, Analog Line port, and Modem should be checked between the Combined Modem Pool components.

There are three types of commands that can be used to test Modem Pool circuits: **test port, test modem-pool #,** and **test board.** The **test port** command is generally the first test to run after the Error Log is evaluated and an entry is found for a Modem Pool port. The **test modem-pool #** command runs the same tests as the **test port short** command performed on a Modem Pool port. However, the **test modem-pool #** command can automatically test all ports in the Modem Pool group number specified in #. The **test board** command performs the same tests as **test port** and **test modem-pool #** plus additional tests for circuits common to the entire circuit pack. Refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation for information on additional tests performed with **test board** (#50, #52, and #53).

If the Modem Pool port or group being tested with **test modem-pool #** contains Combined Modem Pools, the ports on the associated TN742 or TN746 Analog Line circuit pack and the TN754 Digital Line circuit pack are tested as a group. Note, however, that Combined Modem Pools are not tested with the tests described in this section and the repair information related to Tests # 96, 97, 98, and 99 is not applicable. The Analog port of the Combined Modem port is tested with Analog port tests (that is, Tests #6, #47, #35, #48 and #36), and the Digital port of the Combined Modem port is tested with TDMODULE/PDMODULE tests (that is, Tests #9, #13, #17 and #175). Therefore, use the repair procedures outlined in the ANL-LINE, ANL-16-L, ANL-NE-L, and TDMODULE/PDMODULE

Maintenance documentation when interpreting the results of the execution of the **test modem-pool** # command on Combined Modem Pools.

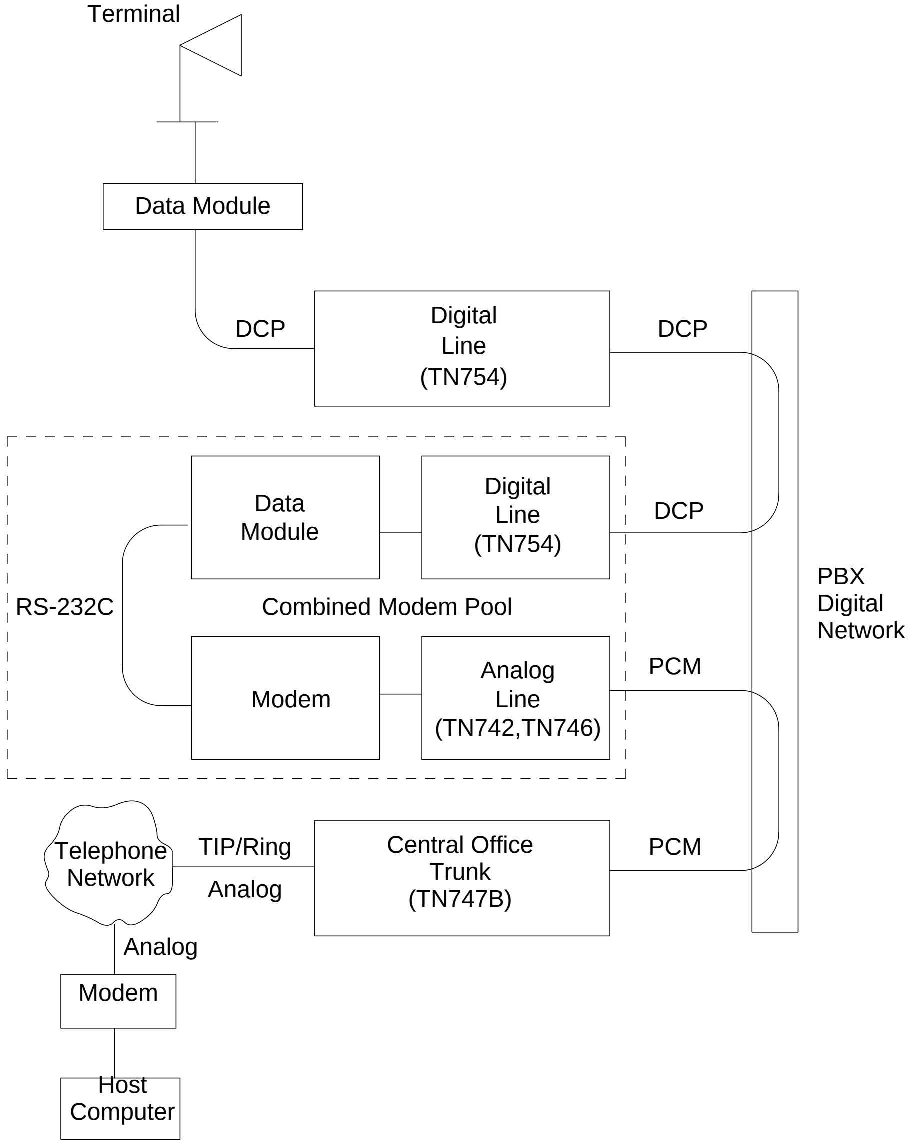

Figure 11-76. Typical Modem Pool Switched Connection with Combined Modem Pool

Hardware Error Log Entries and Test to Clear Values

Modem Pool Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
18	0	busyout PCSS	WARNING	OFF	release port PCSSpp
130 (a)		None	WARNING	ON	test port PCSSpp sh
257		Conversion Resource Loop Test (#98)	MINOR	ON	test port PCSSpp sh r 3
513		Modem Conference Test(#97)	MINOR	ON	test port PCSSpp l r 3
769		Modem NPE Crosstalk Test (#96)	MINOR	ON	test port PCSSpp l r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Note:

a. This error type indicates that the circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Modem Pool Conference Test,* for example, you may also clear errors generated from other tests in the testing sequence. The tests in this section do not apply to Combined Modem Pool conversion resources. The standard Digital Line and/or Analog Line port tests are run on the ports associated with the Combined Modem Pool. The test descriptions for those maintenance objects (MOs) should be consulted when repairing Combined Modem Pool arrangements.

For example, you may also clear errors generated from other tests in the testing sequence. The tests in this section do not apply to Combined Modem Pool conversion resources. The standard Digital Line and/or Analog Line port tests are run on the ports associated with the Combined Modem Pool. The test descriptions for those maintenance objects (MOs) should be consulted when repairing Combined Modem Pool arrangements.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Modem Pool NPE Crosstalk Test (#96)		X	D
Modem Pool Conference Test (#97)		X	D
Modem Pool Conversion Resource Loop Around Test (#98)	X	X	ND
Modem Pool Audits Test (#99)	X	X	ND

1 D = Destructive; ND = Nondestructive

Modem Pool NPE Crosstalk Test (#96)

This test is destructive.

This NPE Crosstalk Test verifies that the NPE is connected only to the desired time slot and is not crosstalking on other time slots. This test operates exactly like Test #6 for other types of port circuits but is performed twice in order to test both NPEs in the Modem Pool Port.

Table 11-226. TEST #96 Modem Pool NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Determine whether the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-226. TEST #96 Modem Pool NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Hardware Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Hardware Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. 1. Examine the Hardware Error Log for existing errors against this port or the circuit pack, and attempt to diagnose the previously existing errors.
2000	ABORT	A response to the test request was not received within the allowable time period. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-226. TEST #96 Modem Pool NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
6000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. 1. Wait one minute and attempt the test again. 2. If it is absolutely necessary to test the conversion resource, the call must be dropped by issuing a **busyout port PCSS** command against the conversion resource. Issue the **release port PCSS** command. The busyout and release of the port drop any existing calls on that port. 3. Run the test again. 4. If the same error occurs while the conversion resource is idle, busyout and release both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. This action drops any existing calls on that circuit pack. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 6. If the test continues to abort with this error code after circuit pack replacement, escalate the problem.
6001	ABORT	System resources needed to complete the test could not be allocated for the analog section of the Modem Pool conversion resource. 1. Follow the test procedures for the previous error code.

Continued on next page

Table 11-226. TEST #96 Modem Pool NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
NONE	FAIL	The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest. 3. If the circuit pack fails after replacement, escalate the problem.
ANY	FAIL	The NPE of the tested port was found to be transmitting in error. This condition causes noisy and unreliable connections. 1. If the remaining ports are currently not in use (that is, yellow LED is off), attempt to reset the circuit pack. Then repeat the test. 2. If the test fails again, replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

Modem Pool Conference Test (#97)

This test is destructive.

This test checks most of the switching and gain control functions provided by the NPE circuit in the analog section of the conversion resource. This test conferences a 1004-Hz tone through the NPE, looping it back so that it can be verified with a Tone Detector circuit.

Table 11-227. TEST #97 Modem Pool Conference Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Determine whether the port is available for testing.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM Bus errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-227. TEST #97 Modem Pool Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. 1. Examine the Hardware Error Log for existing errors against this port or the circuit pack, and attempt to diagnose the previously existing errors.
2000	ABORT	The response to the test request was not received within the allowable time period.
2012	ABORT	Internal System Error.
2100	ABORT	System resources required for this test are not available.
2103	ABORT	The system could not make the conference connection for the test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-227. TEST #97 Modem Pool Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4000	ABORT	System resources needed to complete the test could not be allocated. Ordinarily, this means the conversion resource or other hardware used during the test was in use. 1. Wait one minute and attempt the test again. 2. If it is absolutely necessary to test the conversion resource, the call must be dropped by issuing a **busyout port PCSS** command against the conversion resource. Issue the **release port PCSS** command. The busyout and release of the port drop any existing calls on that port. 3. Run the test again. 4. If the same error occurs while the conversion resource is idle, busyout and release both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under the test. This action drops any existing calls on that circuit pack. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 6. If the test continues to abort with this error code after circuit pack replacement, escalate the problem.
65515	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. Issue the **test port long** command on the port on which the test aborted. If any test aborted or failed, follow recommended maintenance strategy for the appropriate port type (for example, ANL-LINE, DIG-LINE). 3. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-227. TEST #97 Modem Pool Conference Test — *Continued*

Error Code	Test Result	Description/ Recommendation
NONE	FAIL	The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest. 3. If the circuit pack fails after replacement, escalate the problem.
ANY	FAIL	The Network Processing Element (NPE) of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. 1. If the remaining ports are currently not in use (that is, yellow LED is off), attempt to reset the circuit pack. Then repeat the test. 2. If the test fails again, replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

Modem Pool Conversion Resource Loop Around Test (#98)

The Modem Pool Conversion Resource Loop Around Test is set up as follows:

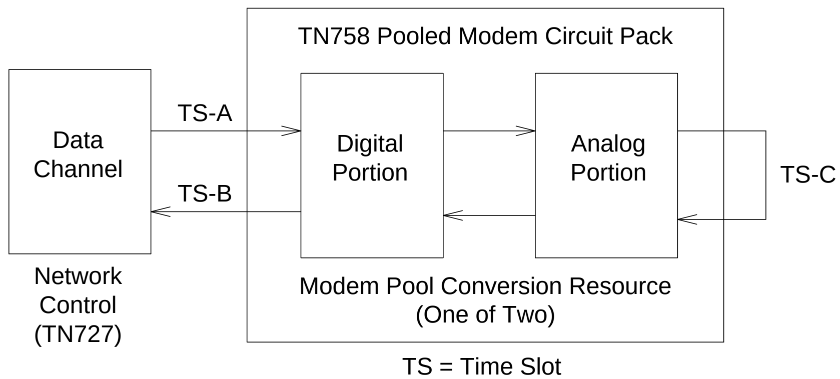

Figure 11-77. Modem Pool Conversion Resource Loop Around Test Set-up

Test data patterns are transmitted from the Network Control Channels 1 or 3 over network time slot A through the digital port, looped around through the analog port via time slot C back to the Network Control Channel circuit via time slot B where the patterns are checked for accuracy. Finally, the test forces a disconnect by breaking the connection between the Data Channel and Modem Pool Port (time slot A) and verifying that the Data Channel and Modem Pool Port go on-hook within the proper time.

This test attempts to allocate a Network Control Channel, Modem Pool Port, and other internal resources. If any of these allocation attempts fail, the test cannot be completed and a specific abort error is reported.

Table 11-228. TEST #98 Modem Pool Conversion Resource Loop Around Test

Error Code	Test Result	Description/ Recommendation
NONE	ABORT	Internal System Error. 1. Wait one-minute and try the test again. 2. If the error occurs again, escalate the problem.
5000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. 1. Wait one minute and attempt the test again. 2. If it is absolutely necessary to test the conversion resource, the call must be dropped by issuing a **busyout port PCSS** command against the conversion resource. Issue the **release port PCSS** command. The busyout and release of the port drop any existing calls on that port. 3. Run the test again. 4. If the same error occurs while the conversion resource is idle, busyout and release both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. This action drops any existing calls on that circuit pack. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 6. If the test continues to abort with this error code after circuit pack replacement, escalate the problem.

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Table 11-228. TEST #98 Modem Pool Conversion Resource Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5001	ABORT	A Network Control Channel could not be allocated for this test. This error is more closely related to the Data Channels (1 or 3 only) on the DATA-CHL circuit pack used for this test than the TN758 Pooled Modem circuit pack itself. Therefore, any hardware testing or replacement activities focus on the DATA-CHL circuit pack. However, the Data Channels on the DATA-CHL circuit pack normally should not be busied out, tested with the **test data-module** command, or reseated in the carrier to clear this error, since this may drop other data calls that may be active at the time. The administration of Data Channels 1 and 3 should be checked if this error occurs. 1. Wait one minute and attempt the test again. 2. If the same error persists after five attempts at one-minute intervals, escalate the problem.
5002	ABORT	The Network Control Channel allocated for this test could not be set to "maintenance busy" status. 1. Follow the repair procedures for Error Code 5001.
5003	ABORT	The test was not able to establish a connection for the digital portion of the Modem Pool Port. 1. Follow the repair procedures for Error Code 5000.
5004	ABORT	The test was not able to allocate the analog portion of the Modem Pool Port. 1. Follow the repair procedures for Error Code 5000.
5005	ABORT	The test was not able to establish a connection for the analog portion of the Modem Pool Port. 1. Follow the repair procedures for Error Code 5000.

Continued on next page

Table 11-228. TEST #98 Modem Pool Conversion Resource Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5006	FIL	The Modem Pool Port did not respond to the "maintenance activate" message. This error is internal to the Modem Pool circuit pack and does not involve external equipment or interfaces. The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest. 3. If the circuit pack fails after replacement, escalate the problem.
5007	ABORT	The Network Control Channel allocated for this test did not respond to the incoming call indication. 1. Follow the repair procedures for Error Code 5001.
5009	ABORT	The Network Control Channel allocated for this test did not handshake correctly. 1. Attempt the test again. 2. If the same error occurs, test the DATA-CHL circuit pack using the **test data-module** command (refer to the DATA-CHL maintenance strategy). 3. If the DATA-CHL circuit pack tests pass, escalate the trouble report.
5010	FAIL	The Data Loop Around Test failed, indicating a probable problem with the TN758 Pooled Modem circuit pack. 1. Follow the repair procedure for Error Code 5006.
5011	ABORT	The Network Control Channel allocated for this test did not disconnect properly. 1. Follow the repair procedures for Error Code 5001.
5012	ABORT	The digital portion of the tested Modem Pool Port did not disconnect properly. 1. Follow the repair procedures for Error Code 5000.

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Table 11-228. TEST #98 Modem Pool Conversion Resource Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5013	FAIL	The Modem Pool Port did not respond with an on-hook message when the connection to the Data Channel was broken, indicating a likely problem with the TN758 Pooled Modem circuit pack. 1. Follow the repair procedure for Error Code 5006.
5014	ABORT	The Network Control Channel allocated for this test did not respond correctly to the setup message sent to it after the connection was established. 1. Attempt the test again. 2. If the same error occurs, test the DATA-CHL circuit pack using the **test data-module** command (refer to the DATA-CHL maintenance strategy). 3. If the DATA-CHL circuit pack tests pass, escalate the problem.
5015	ABORT	Data Channels 1 and/or 3 have not been administered. 1. Administer the Data Channels and retest.

Modem Pool Audit Test (#99)

This audit updates the Modem Pool conversion resource status contained in the TN758 Pooled Modem circuit pack's microprocessor. It does not actually test the Pooled Modem circuit pack; therefore, there are no FAIL codes. The audit can only be performed on idle conversion resources. If the conversion resource is in use, the audit aborts.

Table 11-229. TEST #99 Modem Pool Audit Test

Error Code	Test Result	Description/ Recommendation
NONE	ABORT	The system was not able to allocate all the necessary resources to execute this test. An ABORT simply indicates that the conversion resource was in use when the audit was performed. No repair action is necessary unless it was known that the conversion resource was actually idle during the test (yellow in-use LED was off) or was busied out before the test was run. If this is the case, a TN758 failure condition may exist and the following procedure should be used: 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 3. If the circuit pack fails after replacement, escalate the problem.

M/T-ANL (Maintenance/Test Analog Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
M/T-ANL	Minor	test port PCSSpp l	Maintenance/Test Analog Port
M/T-ANL	Warning	release port PCSSpp	Maintenance/Test Analog Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The Maintenance/Test Analog Port is port number 1 on the TN771 Maintenance/Test circuit pack. This port is used by the Automatic Transmission Measurement System (ATMS) as an Originating Test Line (OTL) or Terminating Test Line (TTL) for test calls over analog trunks. Figure 11-78 shows a typical ATMS configuration.

M/T-ANL maintenance ensures that the analog trunk's testing function is operating correctly. An alarm against M/T-ANL can reduce service, but it will not block it. To accurately measure performance and health of analog trunks, the TN771 should be replaced when a new circuit pack is available.

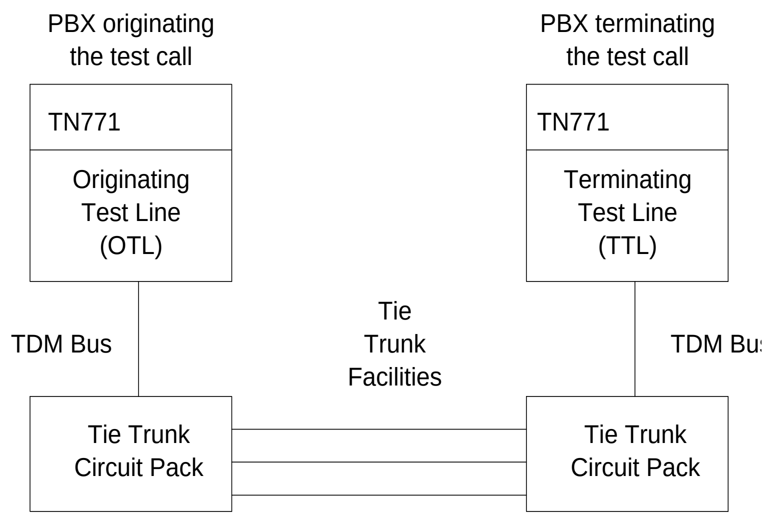

Figure 11-78. ATMS Tie Trunk Test Call

Hardware Error Log Entries and Test to Clear Values

M/T-ANL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1] (a)	0	Any	Any	Any	test port PCSSpp
1 (b)	41018	none	MINOR	ON	test port PCSSpp l r 3
18	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
257	Any	NPE Crosstalk test (#9)	MINOR	ON	test port PCSSpp l r 3
513	Any	Analog Port Sanity Test (#963)	MINOR	ON	test port PCSS01 r 2
769	Any	Analog Port Digital Loop Around Test (#13)	MINOR	ON	test port PCSSpp r 3
3840(c)	Any	Hook State Inquiry test (#566)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error code appears in the Error Log only if the MTB circuit pack has been removed since the Error Log was last cleared. Verify that the circuit pack has been reinserted.

b. This error indicates a hardware failure on the Analog Port circuitry. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the command above.

c. This error indicates that call processing records did not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test Analog Port. This error is not service-affecting and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Analog Port Sanity Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Port Sanity Test (#963)	X	X	ND
Digital Loop Around Test (#13)	X	X	ND
NPE Crosstalk Test (#9)		X	ND
Hook State Inquiry (#566)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#9)

The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections.

One or more Network Processing Elements (NPE) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity, gain, and provides conferencing functions on a per port basis. If the NPE is not working correctly, one way and/or noisy connections may be observed. This test is part of a port's long test sequence and takes approximately 10 to 20 seconds to complete

Table 11-230. TEST #9 NPE Cross Talk Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid ATMS trunk test call. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. Refer to TDM-BUS Maintenance documentation to diagnose any active TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. To view the system occupancy measurements enter the command **status system health** on the system technician terminal. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-230. TEST #9 NPE Cross Talk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at 1 minute intervals a maximum of 3 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a valid ATMS test call. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort and the port is not in use on a valid ATMS Test Call, escalate the problem. To determine whether the port is in use by an ATMS Test Call enter **status station ext** where **ext** is the assigned ATMS station number.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.

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Table 11-230. TEST #9 NPE Cross Talk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. 1. If the remaining ports are currently not in use (yellow LED is off), try to reset the circuit pack via the **busyout board PCSS**, **reset board PCSS**, **release board PCSS** command sequence. Then repeat the test. 2. If the test fails again, replace circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by examining station, trunk, or external wiring.

Analog Port Digital Loop Around Test (#13)

This test is a modification of the Voice and Control Channel Local Loop Test used by Digital Station (DIG-LINE) maintenance. This test does not perform the control channel and secondary information channel loop around tests as described for DIG-LINE, as these data paths do not exist for the Maintenance/Test Analog Port. The primary information channel is tested by first looping back the data channel onto the TDM Bus, and then sending a digital count from the Tone-Clock circuit pack and receiving the same digital count with a general purpose tone detector. A conference test is done next for the primary information channel. This test is the same as Conference Test (#6).

Only one value (Pass, Fail, or Abort) is generated as a result of the two tests. If either fails or aborts, the sequence is stopped

Table 11-231. TEST #13 Analog Port Digital Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The port is in use on a valid ATMS Test Call. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort and the port is not in use on a valid ATMS Test Call, escalate the problem. To determine whether the port is in use by an ATMS Test Call enter **status station ext** where **ext** is the assigned ATMS station number.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-231. TEST #13 Analog Port Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance to diagnose any active TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. To view the system occupancy measurements enter the command **status system health** on the system technician terminal. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the command at 1 minute intervals a maximum of 3 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid ATMS Test Call. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort and the port is not in use on a valid ATMS Test Call, escalate the problem. To determine whether the port is in use by an ATMS Test Call enter **status station ext** where **ext** is the assigned ATMS station number.

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Table 11-231. TEST #13 Analog Port Digital Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
7	FAIL	Conference test failed on the primary information channel. 1. Run the circuit pack tests to check the Tone/Clock (TONE-BD) circuit pack and the Tone Detector circuit pack via the **test board PCSS** command. 2. Resolve any problems that are detected on the Tone/Clock (TONE-BD) circuit pack or Tone Detector circuit pack. See the section on Tone Generator circuit pack. 3. If the Tone/Clock and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.
14	FAIL	The primary information channel is not transmitting properly. User may not notice any interruption in service or may not be able to use this port. 1. Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using **test board PCSS**. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. See the section on Tone Generator circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test Circuit Pack.
	PASS	The Maintenance/Test Analog Port analog trunk testing capability is operating correctly.

Clear Error Counters (#270)

The ports on the Maintenance/Test circuit pack continually run self-tests, whenever the port is idle. The Angel uses a counter so that the Background Maintenance Failure message is only sent uplink once (this keeps a failed port/circuit pack from flooding the SPE with a string of messages). Many circuit packs have counters in the Angel firmware. These counters are used so that Control Channel Message Set (CCMS) messages are not continuously sent uplink. Using this method, the message will be sent once, when the counter reaches some preset threshold, and then not sent again until the counter is cleared. This test is used to clear the counter, so that if the port continues to fail during or after SPE-demanded testing, the Angel will send a message to indicate that fact.

This test is only used to send a message to the Angel on the Maintenance/Test Circuit Pack. Therefore, this test should never abort or fail.

Table 11-232. TEST #270 Clear Error Counters

Error Code	Test Result	Description/ Recommendation
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

Hook State Inquiry (#566)

This test ensures that the Maintenance/Test Analog Port maintenance software and call processing agree on the on-/off-hook status of the Maintenance/Test Analog Port.

Table 11-233. TEST #566 Hook State Inquiry

Error Code	Test Result	Description/ Recommendation
1	ABORT	Switch hook audit timed out. No response was received from the circuit pack for information about the switch hook state. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, replace the circuit pack and repeat the test. 3. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	Internal System Error 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to fail reset the circuit pack via the **busyout board PCSS**, **reset board PCSS**, **release board PCSS** command sequence. 3. Retry the command at 1 minute intervals a maximum of 3 times. 4. If the test continues to fail, escalate the problem.
	PASS	Call processing and Maintenance/Test Analog Port maintenance software agree on the Maintenance/Test Analog Port hook state.

Analog Port Sanity Test (#963)

This test verifies that the port circuitry involved in the analog trunk testing on the Maintenance/Test Analog Port is functioning properly.

This test will abort if an ATMS Test Call is in progress on the Maintenance/Test Analog Port when the test is requested.

Table 11-234. TEST #963 Analog Port Sanity Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at 1 minute intervals a maximum of 3 times. 2. If the test continues to fail, escalate the problem.
50	FAIL	The switch was unable to communicate with the port circuitry used for analog trunk testing. 1. Reset the circuit pack via the **busyout board PCSS**, **reset board PCSS**, **release board PCSS** command sequence. 2. Test the port again via the **test port PCSS01 l** command. 3. If the test fails again, replace the circuit pack.
	PASS	The Maintenance/Test Analog Port analog trunk testing capability is operating correctly.

M/T-BD (Maintenance/Test Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
M/T-BD	MIN	test board PCSS l	Maintenance Test Circuit Pack
M/T-BD	WRN	release board PCSS	Maintenance/Test Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

CAUTION:

In G3iV1.1-286 and G3iV2-386, a TN771D (or later vintage) Maintenance/Test circuit pack must be used.

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also M/T-DIG (Maintenance/Test Digital Port) and M/T-PKT (Maintenance/Test Packet Bus Port) Maintenance documentation for related digital port and Packet Bus port information, respectively.

M/T-DIG (Maintenance/Test Digital Port) [G3iV1-1.286, G3iV2-386]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
M/T-DIG	Minor	test port PCSSpp l	Maintenance/Test Digital Port
M/T-DIG	Warning	release port PCSSpp	Maintenance/Test Digital Port

1 Where P is the port network number (1 for PPN, 2 or, 3 for EPN-1 and 3 for EPN-2); C is the carrier designation (A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The Maintenance/Test Digital Port is a port on the TN771D (or later vintage) Maintenance/Test circuit pack, which is required for G3iV1.1-286 or G3iV2-386. Ports 2 and 3 are Digital Ports. The Maintenance/Test Digital Port provides the ability to perform digital (that is, ISDN-PRI) trunk testing via the TDM Bus. For an ISDN-PRI test call, connections are set up in the system as shown in Figure 11-79.

When the Maintenance/Test Digital Port is participating in an ISDN-PRI test call, the port sends a stream of pseudo-random data along the connected B-channel. The far end loops back this data, and the Maintenance/Test Digital Port compares the data to that which was sent. Errors are recorded on a bit and block basis. Refer to ISDN-TRK (DS1ISDN Trunk) Maintenance documentation for more information on ISDN-PRI test calls.

The Maintenance/Test Digital Port maintenance ensures that the digital trunk testing function is operating correctly. The Maintenance/Test Digital Port is alarmed if maintenance determines that the digital port is operating incorrectly.

NOTE:
An alarm on the Maintenance/Test Digital Port reduces service, but does not block it since the ISDN-TRK has other means to determine the health of the ISDN-PRI trunk facility. However, to accurately measure the error performance and to ensure accuracy of the health of the ISDN-PRI trunk, the Maintenance/Test circuit pack should be replaced when a new circuit pack is available.

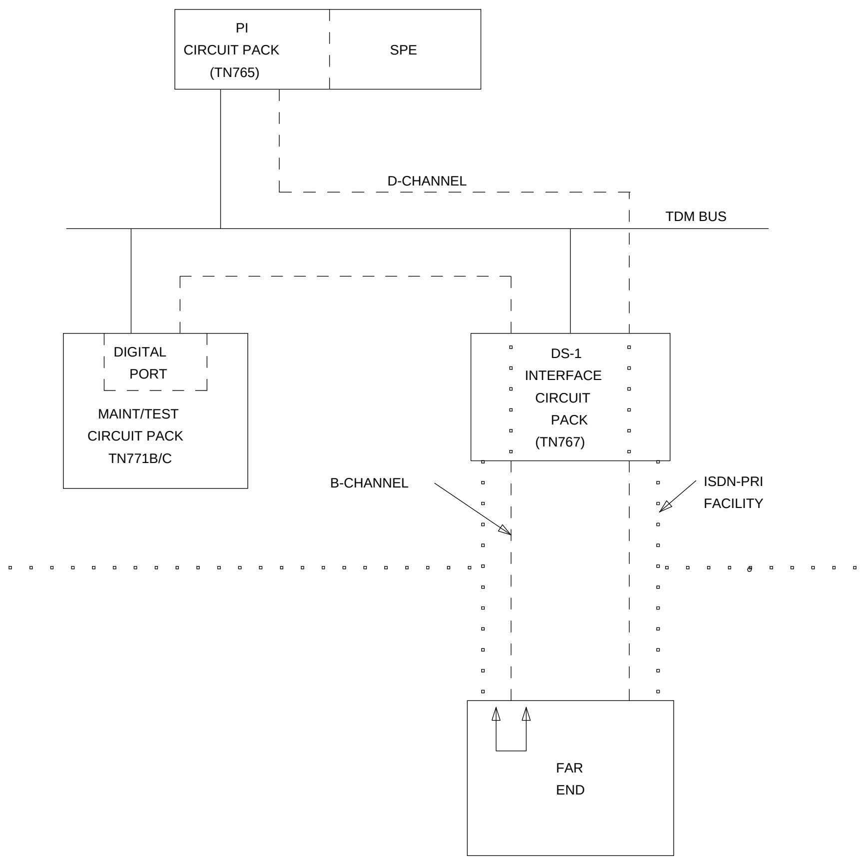

Figure 11-79. ISDN-PRI Outgoing Test Call

Hardware Error Log Entries and Test to Clear Values

M/T-DIG Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp
1 (a)	41018	none	MINOR	ON	test port PCSSpp l r 3
18 (b)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
257 (c)	Any	NPE Crosstalk Test (#9)	MINOR	ON	test port PCSSpp l r 3
513 (d)	Any	Digital Port Sanity Test (#565)	MINOR	ON	test port PCSS02 r 2
769 (e)	Any	Digital Port Loop Around Test (#13)	MINOR	ON	test port PCSSpp r 3
3840 (f)	Any	Hook State Inquiry Test (#566)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates a hardware failure on the Digital Port circuitry. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the command above.

b. The port has been busied out via the **busyout port PCSSpp** command.

c. This error indicates that Maintenance/Test Digital Port is talking on more than just its assigned time slot. Replace the Maintenance/Test circuit pack.

d. This error indicates that the Maintenance/Test Digital Port has failed its self-test. Since the Digital Port Sanity Test runs only on Port 2, but tests both Ports 2 and 3, both ports are alarmed when the test fails. Note that the command above indicates to test Port 2, even if the error is logged against Port 3.

e. This error indicates that the Maintenance/Test Digital Port has been unable to successfully loop data from a tone generator to a tone detector.

f. This error indicated that call processing records did not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test Digital Port. This error is not service-affecting and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Digital Port Sanity Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Port Sanity Test (#565)	X	X	ND
Digital Port Loop Around Test (#13)	X	X	ND
NPE Crosstalk Test (#9)		X	ND
Hook State Inquiry (#566)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#9)

This test is a modified version of the Digital Line NPE Crosstalk Test used by DIG-LINE maintenance.

One or more NPE reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity, gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one way and/or noisy connections may be observed. This test is part of a port's long test sequence and takes approximately 10 to 20 seconds to complete. This test is a modified version of the Digital Line NPE Crosstalk Test used by DIG-LINE maintenance.

Table 11-235. TEST #9 NPE Cross Talk Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid ISDN-PRI test call. Use the **list isdn-testcall** command to determine if the port is in use (if the port is listed in the M/T Port column). If it is in use, either wait for the test call to complete (as indicated in the Start Time and Duration fields in the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where **tg/mem** is determined from the B-channel field of the above display. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-235. TEST #9 NPE Cross Talk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. Refer to TDM-BUS Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a valid ISDN-PRI test call. Use the **list isdn-testcall** command to determine which call is using the port (from the M/T Port column). Either wait for the test call to complete (as indicated in the Start Time and Duration fields of the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where tg/mem is determined from the B-channel field of the above display. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-235. TEST #9 NPE Cross Talk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. If the remaining ports are currently not in use (yellow LED is off), try to reset the circuit pack. Then repeat the test. 2. If the test fails again, replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

Digital Port Loop Around Test (#13)

This test is a modification of the Voice and Control Channel Local Loop Test used by Digital Station (DIG-LINE) maintenance. This test does not perform the control channel and secondary information channel loop around tests as described for DIG-LINE, as these data paths do not exist for the Maintenance/Test Digital Port. The primary information channel is tested by first looping back the data channel onto the TDM Bus, and then sending a digital count from the Tone-Clock circuit pack and receiving the same digital count with a general purpose tone detector. A conference test is done next for the primary information channel. This test is the same as Conference Test #6.

Only one value (Pass, Fail, or Abort) is generated as a result of the two tests. If either fails or aborts, the sequence is stopped.

Table 11-236. TEST #13 Digital Port Loop Around Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The port is in use on a valid ISDN-PRI Test Call. Use the **list isdn-testcall** command to determine which call is using the port (from the M/T Port column). Either wait for the test call to complete (as indicated in the Start Time and Duration fields in the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where tg/mem is determined from the B-channel field of the above display. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-236. TEST #13 Digital Port Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid ISDN-PRI Test Call. Use the **list isdn-testcall** command to determine which call is using the port (from the M/T Port column). Either wait for the test call to complete (as indicated in the Start Time and Duration fields of the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where tg/mem is determined from the B-channel field of the above display. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.

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Table 11-236. TEST #13 Digital Port Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. 1. Retry the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
7	FAIL	Conference test failed on the primary information channel. In most cases, the user may not notice a disruption in service. 1. Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack via the **test board PCSS** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.

Continued on next page

Table 11-236. TEST #13 Digital Port Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
14	FAIL	The primary information channel is not transmitting properly. User impact may range from nothing to not being able to use this port. 1. Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using **test board PCSS**. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test Circuit Pack.
	PASS	The Maintenance/Test Digital Port digital trunk testing capability is operating correctly.

Clear Error Counters (#270)

This test is not an actual test in the strict sense of the word. Many circuit packs have counters in the Angel firmware. These counters are used so that Control Channel Message Set (CCMS) messages are not continuously sent uplink. Using this method, the message is sent once, when the counter reaches some preset threshold, and then not sent again until the counter is cleared.

The ports on the Maintenance/Test circuit pack continually run self-tests, whenever the port is idle. The Angel uses a counter so that the Background Maintenance Failure message is only sent uplink once (this keeps a failed port/circuit pack from flooding the SPE with a string of messages). This test is used to clear the counter, so that if the port continues to fail during or after SPE-demanded testing, the Angel sends a message to indicate that fact.

This test is only used to send a message to the Angel on the Maintenance/Test Circuit Pack. Therefore, this test should never abort or fail.

Table 11-237. TEST #270 Clear Error Counters

Error Code	Test Result	Description/ Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

Digital Port Sanity Test (#565)

This test verifies that the port circuitry involved in the digital trunk testing on the Maintenance/Test Digital Port is functioning properly. This circuitry is common to both Maintenance/Test Digital Ports on the Maintenance/Test circuit pack. Therefore, this test is only run for Port 2. The test aborts when run on Port 3, as described in Table 11-238.

This test operates by connecting the two Maintenance/Test Digital Ports on the TDM Bus so that they talk and listen to each other. Then four self-tests are attempted: (a) sending data from Port 2 to Port 3 in asynchronous mode; (b) sending data from Port 3 to Port 2 in asynchronous mode; (c) sending data from Port 2 to Port 3 in synchronous mode; and (d) sending data from Port 3 to Port 2 in synchronous mode. The test passes if all four of these self-tests are successful. The test stops as soon as any one of these self-tests fails.

This test aborts if an ISDN Test Call is in progress on either Maintenance/Test Digital Port when the test is requested, or if an ISDN Test Call is initiated while the Digital Port Sanity Test is in progress.

Table 11-238. TEST #161 Loop Around Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	One of the Maintenance/Test Digital Ports is busy with background maintenance. 1. Either wait for the port to become idle, or busyout both Maintenance/Test Digital Ports on the Maintenance/Test circuit pack via the **busyout port PCSS02** and **busyout port PCSS03** commands, respectively. 2. Release the ports (if they were busied out) via the **release port PCSS02** and **release port PCSS03** commands, respectively. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-238. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. Refer to the TDM-BUS Maintenance documentation to diagnose any active TDM Bus errors. 1. If the system has no TDM-BUS errors, and if not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid ISDN-PRI Test Call. Use the **list isdn-testcall** command to determine which call is using the port (from the M/T Port column). Either wait for the test call to complete (as indicated in the Start Time and Duration fields of the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where **tg/mem** is determined from the B-channel field of the above display.
1019	ABORT	An ISDN Test Call is in progress using this Maintenance/Test circuit pack. The Maintenance/Test circuit pack cannot perform a self-test on one of its Digital Ports while an ISDN Test Call is using either of the Digital Ports. Use the **list isdn-testcall** command to determine which call is using the port (form the M/T Port column). Either wait for the test call to complete (as indicated in the Start Time and Duration fields of the above display), or abort the test call with the **clear isdn-testcall tg/mem** command, where **tg/mem** is determined from the B-channel field of the above display. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1138	ABORT	This test does not run on Port 3 of the Maintenance/Test circuit pack. This test runs only on Port 2. Look at the results of the Digital Port Sanity Test for Port 2. 1. Run the command again for Port 2 via the **test port PCSS02** or **test port PCSS02 l** command.

Continued on next page

Table 11-238. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-238. TEST #161 Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
50	FAIL	The switch was unable to communicate with the port circuitry used for digital trunk testing.
100	FAIL	Data was not sent from Port 2 to Port 3 successfully in asynchronous mode.
101	FAIL	Data was not sent from Port 3 to Port 2 successfully in asynchronous mode.
102	FAIL	Data was not sent from Port 2 to Port 3 successfully in synchronous mode.
103	FAIL	Data was not sent from Port 3 to Port 2 successfully in synchronous mode. 1. Reset the circuit pack via the **busyout board PCSS**, **reset board PCSS**, **release board PCSS** command sequence. 2. Test the port again via the **test port PCSS02 l** command. 3. If the test fails again, replace the circuit pack.
	PASS	The Maintenance/Test Digital Port digital trunk testing capability is operating correctly.

Hook State Inquiry (#566)

This test ensures that the Maintenance/Test Digital Port maintenance software and call processing agree on the on-/off-hook status of the Maintenance/Test Digital Port.

Table 11-239. TEST #161 Loop Around Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Switch hook audit timed out. No response was received from the circuit pack for information about the switch hook state. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, replace the circuit pack and repeat the test. 3. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	Internal System Error. This test should never return a failure. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail reset the circuit pack via the **busyout board PCSS**, **reset board PCSS**, **release board PCSS** command sequence. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to fail, escalate the problem.
	PASS	Call processing and Maintenance/Test Digital Port maintenance software agree on the Maintenance/Test Digital Port hook state.

M/T-PKT (Maintenance/Test Packet Bus Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
M/T-PKT	Minor	test port PCSSpp l	Maintenance/Test Packet Bus Port
M/T-PKT	Warning	release port PCSSpp	Maintenance/Test Packet Bus Port

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

The Maintenance/Test Packet Bus Port is a port (always Port #4) on the TN771D (or later vintage) Maintenance/Test circuit pack, which is required for G3iV1.1-286 or G3iV2-386. The Packet Bus port provides the following Packet Bus maintenance functions:

- Packet Bus fault detection - the ability to detect faults (for example, shorts, open leads) on the Packet Bus autonomously (that is, without SPE involvement).
- Packet Bus reconfiguration - the ability to swap faulty leads with spare leads autonomously so that the Packet Bus remains operational. This is accomplished by sending messages to all Packet circuit packs [for example, ISDN-BRI (TN556)] telling them which spare leads to use on the Packet Bus.

Maintenance/Test Packet Bus Port maintenance ensures that these maintenance functions are operating correctly. The Maintenance/Test Packet Bus Port is alarmed if maintenance determines that the port's maintenance functions are operating incorrectly.

When Maintenance/Test Packet Bus Port maintenance determines that the Packet Bus Port is defective, the Packet Bus fault detection and Packet Bus reconfiguration functions provided by the port are turned off.

Maintenance/Test Packet Bus Port maintenance interacts with Packet Bus maintenance. Therefore, there may be alarms on the Packet Bus when there is a fault on the Maintenance/Test Packet Bus Port. Refer to PKT-BUS (Packet Bus) Maintenance documentation for further information.

Hardware Error Log Entries and Test to Clear Values

M/T-PKT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp
1 (a)	41018	none	MINOR	ON	test port PCSSpp l r 3
18 (b)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
257 (c)	Any	none	MINOR	ON	
513 (d)	Any	Packet Bus Port Health Inquiry Test (#567)	MINOR	ON	test port PCSSpp r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error indicates a hardware failure with the port circuitry which provides the Packet Bus maintenance functions. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the test command above.

b. The port has been busied out via the **busyout port PCSSpp** command.

c. This error indicates that the Maintenance/Test Packet Bus Port has reconfigured the Packet Bus (that is, swapped a bad lead to a spare). Note that this error is sent up whenever the Maintenance/Test Packet Bus Port is initialized (since the Packet Bus Port reconfigures the Packet Bus to whatever state it determines the Packet Bus is in). This occurs if the circuit pack is inserted, if the system is restarted, or if the port is released from a busyout state. Therefore, it is normal for this error to be present in the error log.

   If the Maintenance/Test Packet Bus Port reconfigures the Packet Bus 12 times within 15 minutes, a Minor alarm is raised. When the Minor alarm is raised, this is an indication that the Packet Bus maintenance functions are not operating correctly, or that many changes are taking place on the Packet Bus (that is, circuit pack insertion or removal). If the system has been in a stable state for more than 15 minutes, try the following procedures:

   1. Reset the Maintenance/Test circuit pack from the Manager I terminal, as follows:

      ■ Enter the **busyout board PCSS** command.

- Enter the **reset board PCSS** command.
- Enter the **release board PCSS** command.

2. Wait 15 minutes.
3. If the error recurs, replace the Maintenance/Test circuit pack.

When this alarm is active, the yellow LED is in one of three states:

- If there is no activity on the Maintenance/Test circuit pack, the yellow LED is off. It is OK to replace the Maintenance/Test circuit pack.
- If there is an indication of an uncorrectable fault on the Packet Bus, the yellow LED will be blinking at a rate of 1 Hz. It is OK to replace the Maintenance/Test circuit pack. Ignore the Packet Bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.
- If there is other activity on the Maintenance/Test circuit pack (that is, ISDN Test Call), or if there is an indication of a correctable fault on the Packet Bus, the yellow LED will be on steady. If there is an ISDN Test Call in progress, it must be halted via the **clear isdn-testcall grp/member** command prior to replacing the circuit pack. Ignore the Packet Bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.

d. This error indicates a failure of the Packet Bus Port Health Inquiry Test. Either the Packet Bus Port has reported a self-test failure, or the SPE is able to communicate with the Maintenance/Test Circuit Pack but not with the Maintenance/Test Circuit Pack Packet Bus Port. Refer to the description of the Packet Bus Port Health Inquiry Test, and follow the instructions indicated for the failure code that matches the Aux Data field.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Packet Bus Port Health Inquiry Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Bus Port Health Inquiry Test (#567)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive; ND = Nondestructive

Clear Error Counters (#270)

This test is not an actual test in the strict sense of the word. Many circuit packs have counters in the Angel firmware. These counters are used so that CCMS (Control Channel Message Set) messages are not continuously sent uplink. Using this method, the message are sent once, when the counter reaches some preset threshold, and then not sent again until the counter is cleared.

The ports on the Maintenance/Test circuit pack continually run self-tests, whenever the port is idle. The Angel uses a counter so that the Background Maintenance Failure message is only sent uplink once (this keeps a failed port/circuit pack from flooding the SPE with a string of messages). This test is used to clear the counter, so that if the port continues to fail during or after SPE-demanded testing, the Angel sends a message to indicate that fact.

This test is only used to send a message to the Angel on the Maintenance/Test circuit pack. Therefore, this test should never abort or fail.

Table 11-240. TEST #270 Clear Error Counters

Error Code	Test Result	Description/ Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

Packet Bus Port Health Inquiry Test (#567)

This test verifies that the Packet Bus fault detection maintenance function of the Maintenance/Test Packet Bus Port is functioning properly. This is done by having the Maintenance/Test Packet Bus Port perform a self-test. If this self-test passes, then the Packet Bus Port Health Inquiry Test passes. If the self-test fails, or the SPE cannot communicate with the Maintenance/Test Packet Bus Port, then the test fails.

Table 11-241. TEST #567 Packet Bus Port Health Inquiry Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources necessary to run this test are not available.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2059	FAIL	The Maintenance/Test Packet Bus Port has reported a failure of the on-board self-test.
2060	FAIL	The Maintenance/Test Packet Bus Port has reported an invalid state for the Packet Bus.
2061	FAIL	The SPE cannot communicate with the Maintenance/Test Packet Bus Port, but is able to communicate with the Maintenance/Test Circuit Pack. 1. Retry the command. 2. If the test continues to fail, replace the Maintenance/Test circuit pack and retry the command. 3. If the test continues to fail, refer to PKT-BUS Maintenance documentation to determine if the M/T-PKT failure is being caused by a Packet Bus fault.
	PASS	The Maintenance/Test Packet Bus Port Packet Bus fault detection capability is operating correctly.

OPS-LINE (DS1 OPS Line)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
OPS-LINE	MINOR	test station <ext> l	DS1OPS Line
OPS-LINE	WARNING	test station <ext>	DS1OPS Line

An analog Off-Premises Station (OPS) can be connected to the system through a DS1 link. A TN767 DS1 Interface circuit pack supports up to 24 DS1OPSs. Since the DS1OPS is an analog telephone set, a channel multiplexer is necessary as the remote DS1 endpoint that converts the digital signal of a DS1 port to the OPS Line and vice versa. See Figure 11-80 for details.

The DS1OPS Line Maintenance provides a strategy to maintain an OPS Line via a port of the DS1 Interface circuit pack. The strategy covers initialization tests, periodic tests, system technician-demanded tests, and alarm resolution and escalation. Two service states are specified in a DS1OPS Line maintenance. They are: *out-of-service* in which the line is in a deactivated state and cannot be used for either incoming or outgoing calls; *in-service* in which the line is in an activated state and can be used for both incoming and outgoing calls. If the DS1 Interface circuit pack is out-of-service, then all lines on the DS1 Interface circuit pack are put into the out-of-service state, and a Warning alarm is raised.

For maintenance of the remote DS1 endpoint (for example, Channel Division Multiplexer, D4 Channel Bank), refer to the maintenance documentation from its vendor for details.

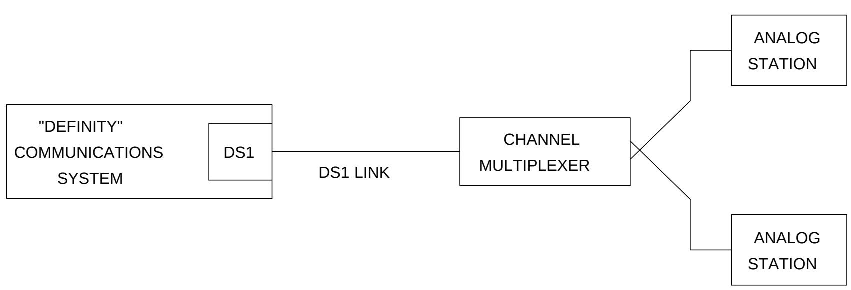

Figure 11-80. DS1 OPS Line Interactions

Hardware Error Log Entries and Test to Clear Values

DS1 OPS Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test station <ext> sh r 1
15 (a)	Any	Audit and Update Test (#36)			
18 (b)	0	busyout station <ext>	WARNING	OFF	release station <ext>
130 (c)		None	WARNING	ON	test station <ext>
1281		Conference Circuit Test (#7)	MINOR	ON	test station <ext> l
1537		NPE Crosstalk Test (#6)	MINOR	ON	test station <ext> l
1793 (d)					test circuit pack PCSS l

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

b. The DS1OPS Line has been busied out by a **busyout station <ext>** command. No calls can be made on this line.

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. Error Type 1793 indicates a problem with the DS1 Interface circuit pack. Since there is no error against the OPS-LINE port, no alarm is raised against the OPS-LINE port. However, there should be errors logged against the DS1 Interface circuit pack. Look for DS1-BD errors in the Hardware Error Log and follow procedures provided in the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1OPS Switchhook Inquiry Test (#312)	X	X	ND
Audit and Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-242. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate system resources to run this test or an internal system error (software) occurred. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-242. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The test was aborted because the port was seized by a user for a valid call. Use **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an an already existing error on the specific port or due to a more general error on the circuit pack. 1. Examine the error log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error. (Error code 1793 indicates a problem with the DS1 interface board, and any problems on the associated DS1-BD or UDS1-BD should be resolved first.)

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Table 11-242. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first. 3. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The test failed. This can be due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and to the TONE-PT Maintenance documentation. 2. Retest when the faults from step 1 are cleared.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Table 11-242. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-243. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1002	ABORT	The test was aborted because the system could not allocate time slots for the test. The system might be under heavy traffic conditions, or it might have time slots out of service due to TDM-BUS errors. (The **status health** command may be used to determine whether the system is experiencing heavy traffic.) Refer to the TDM-BUS (TDM bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors, is not handling heavy traffic, and the port status is idle, retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-243. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. 1. Look for TTR-LEV errors in the error log. If present, refer to the TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at 1-minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** or **status trunk** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1018	ABORT	The test was disabled via translation. 1. You may want to determine why the test has been disabled before you enable it. 2. To enable the test for the particular analog station being tested, enter the 'change station extension' command, and then change the 'Test' field on the 'Station' form from 'n' to 'y.'

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Table 11-243. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general error on the circuit pack. 1. Examine the error log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error. (Error code 1793 indicates a problem with the DS1 interface board, and any problems on the associated DS1-BD or UDS1-BD should be resolved first.)
2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first. 3. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-243. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. 1. Enter the **list configuration board PCSS** command. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281 entries. 2. Test all administered trunks on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. 3. If all of the ports fail, check the CARR-POW (see note below). 4. If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. 5. If the retry passes and troubles have been reported, coordinate isolation with the far-end PBX. Make sure that the near-end and far-end switches and any NTCE equipment (the CSUs) have the correct administration.

Continued on next page

Table 11-243. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(con't.)*	6. Replace the circuit pack. **NOTE:** If the conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

Continued on next page

Table 11-243. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack to assure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of the trunk as kept in the DS1 Interface circuit pack and in the switch software.

Table 11-244. TEST #36 Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port is idle, retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-244. TEST #36 Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1006	ABORT	The test was aborted because the station is out of service. This condition may be accompanied by an error type 18 entry in the error log. You may want to determine why the station was taken out of service. (When stations are taken out of service by maintenance software, the problems that preceded that point must be cleared.) 1. Use the **status station** command to check the service state of the port. If the port is indeed out of service, enter the **release station** command to bring the station back into service. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort and the service state indicates that the station is in service and idle, escalate the problem.
2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first. 3. If the test continues to abort, escalate the problem.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-244. TEST #36 Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7 or 8	FAIL	Test failed due to internal system error. Do not replace port board. ■ Error code 7: the failure occurred during station translation download (to DS1 Interface circuit pack). ■ Error code 8: the failure occurred during station ringer update. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

DS1 OPS Switchhook Inquiry Test (#312)

This test initiates the Switchhook Audit Test. The test queries the switchhook state of the Off-Premises-Station in switch software. If the state in switch software disagrees with the state on the DS1 Interface circuit pack. The state in the switch software is updated to match the state on the DS1 Interface circuit pack.

Table 11-245. TEST #312 DS1OPS Switchhook Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status station** command to determine when the port is available for testing. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1005	ABORT	Test failed due to incompatible configuration administered in station administration. 1. Verify the station administration is the station assigned to Port 24 of the DS1 Interface circuit pack while common channel signaling is specified.
1006	ABORT	The test was aborted because the station is out of service. This condition may be accompanied by an error type 18 entry in the error log. You may want to determine why the station was taken out of service. (When stations are taken out of service by maintenance software, the problems that led up to that must be cleared.) 1. Use the **status station** command to check the state of the port. If the port is indeed out of service, enter the **release station** command to bring the station back into service. 2. Retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, and the station is in the in-service/idle state, escalate the problem.

Continued on next page

Table 11-245. TEST #312 DS1OPS Switchhook Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The DS1 Interface circuit pack is out-of-service. 1. Look for DS1-BD errors in Hardware Error Log. If present, refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first. 3. If the test continues to abort and the board is OK, escalate the problem.
2012	ABORT	The test was aborted due to a system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-245. TEST #312 DS1OPS Switchhook Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	Internal System Error. 1. Look for DS1-BD errors in the Hardware Error Log. If present, refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation. 2. If a channel multiplexer is used as the remote DS1 endpoint to which the station connects, refer to the multiplexer vendor's maintenance document for diagnosis. 3. Retry the command at one-minute intervals a maximum of five times. 4. If the test continues to fail, escalate the problem.
	PASS	The station hook states in both switch software and DS1 Interface circuit pack are consistent.
0 2012	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

PDMODULE, TDMODULE (Data Module)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
PDMODULE[2,3]	MINOR	test port PCSSpp l	Processor Data Module
PDMODULE	WARNING	test port PCSSpp sh	Processor Data Module
TDMODULE[2,3]	MINOR	test port PCSSpp l	Trunk Data Module
TDMODULE	WARNING	test port PCSSpp sh	Trunk Data Module

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

2 The DTDM is considered to be part of the DIG-LINE MO. Refer to the Digital Line testing section for DTDM or linked Data Adapter (DA) failures.

3 Some of the alarms that are logged due to PDMODULE and TDMODULE test failures may be related to circuit pack problems reported during the Common Port Circuit Pack testing phase. Refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation for information about testing the Digital Line circuit packs.

As illustrated in Figure 11-81, data modules provide an interface between the system TN754, TN784, TN413 [G3iV2-386], or TN754 [G3iV2-386] Digital Line circuit pack and data equipment such as terminals, host computers, and modems. Data modules are used for both dial-up and permanent circuit-switched data calls. DA data modules provide this interface when the system uses a TN2136 [G3iV2-386] Digital Line circuit pack.

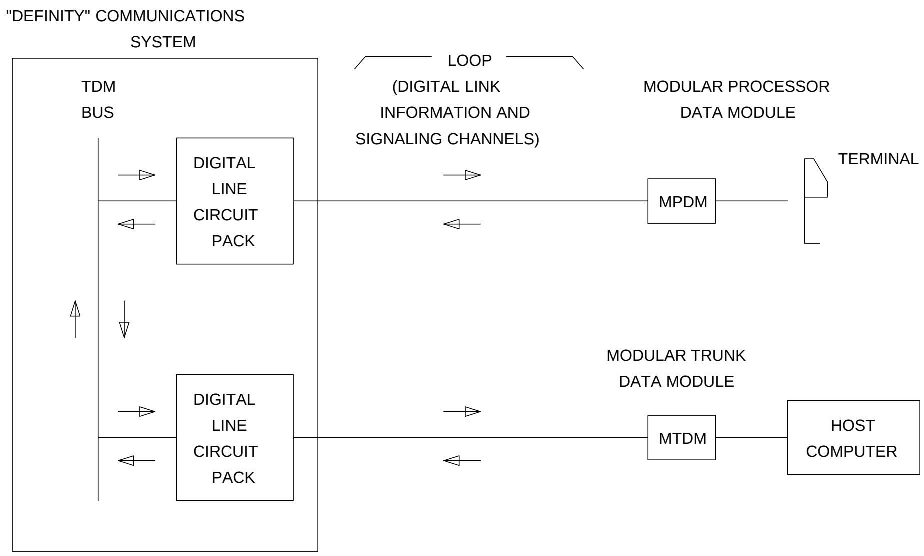

Figure 11-81. Typical Data Module Application

The MPDM provides an interface for Data Terminal Equipment (terminals), and the MTDM (see Note) provides an interface for Data Communications Equipment (transmission equipment such as modems).

NOTE:
Early versions of these data modules were referred to as PDMs and TDMs, respectively. Later models are designed to provide various customer interfaces through the use of interchangeable interface modules and, therefore, are called modular data modules. Both versions are supported by the tests described in this section.

The PBX loop or digital link between a data module and the Digital Line port supports two logical information channels and one signaling channel. MPDMs and MTDMs use the primary information channel for data communications and the signaling channel for dialing and call supervision. The secondary information channel can be used to support a second data module on a shared digital port.

Data modules are not only used for data calls between terminals, computers, and data communications equipment, but are also used as interfaces to equipment associated with system features such as System Administration, CDR, MCS, ACD, DCS, and AUDIX. Maintenance tests for data modules associated with those services are covered by tests other than those described here. (See PI-LINK, PMS-PRNT/JNL-PRNT, and PMS-LINK Maintenance documentation.)

Maintenance of MPDMs and MTDMs is closely related to, and interacts with, the Digital Line circuit pack maintenance in some instances and some of the results of testing MPDMs and MTDMs may be affected by the health of the Digital Line circuit pack. This interaction should be kept in mind when investigating the cause of reported data module problems.

Data modules provide a variety of option switches to allow the customer to select data rates, parity, keyboard dialing, local, and remote loop back, etc. An incorrect setting of those switches does not affect error and alarm information or test results described in this section, but it may result in an inoperable condition. Refer to the Installation Manual provided with the data module for more information about those options.

The DA data module provides an AT (Hayes) type interface that allows the customer to select data rates, parity, local, interface mode (**linked** to digital phone or **stand-alone**), and remote loop back, etc. An incorrect selection does not affect error and alarm information or test results described in this section, but it may result in an inoperable condition.

There are instances in this document where the service state of a data module is mentioned. It is helpful to understand what is meant by the different service states that may exist. An explanation of these service states follows:

- Out-of-Service—The port, and thus the data module, have been removed from service. A busyout of a port or removal of the associated Digital Line circuit pack causes the data module to be placed in the out-of-service state. Failure of the NPE Crosstalk Test (Test #9) also takes a port out-of-service.
- Disconnected—The port is administered but the associated digital link does not respond. An administered port is put in a disconnected state after system booting or circuit pack insertion, until a "link reset pass" message is received from firmware on the associated circuit pack.
- In-Service—Once the PBX software has received a "link reset pass" message from the Digital Line port, the port is placed in the in-service state. In case the "link reset pass" message is missed, and an off-hook message is received while the port is in the disconnected state, maintenance software runs an ID request test and the port is put back in service if a correct response is received.

  If the link is disconnected, the port returns to the disconnect state. Note that it takes a few minutes (less than five) for the state of a data module port to change from in-service to disconnected after the data module is disconnected from the local PBX loop.

Hardware Error Log Entries and Test to Clear Values

PDMODULE and TDMODULE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	40987	None	WARNING	OFF	
1 (b)	1 to 20	None	WARNING	OFF	
15 (c)	Any	None			
18 (d)	0	busyout port PCSSpp	WARNING	OFF	release port PCSSpp
257 (e)	40971	None			
513[2]	0	Data Module Audits Test (#17)	WARNING (j)	OFF	test port PCSSpp sh r 6
769 (f)	40988	None	WARNING	OFF	
1281	Any	Data Module Audits Test (#17)	WARNING	OFF	test port PCSSpp sh r 4
1537 (g)	40968	None	WARNING	OFF	
1793		Information Channel and Control Channel Loop Around Test (#13)	MINOR	ON	test port PCSSpp l r 3
2049		NPE Crosstalk Test (#9)	MINOR	ON	test port PCSSpp l r 3
2305 (h)	32770	None			
2305 (i)	40967	None			
2561		Data Module Internal Loop Around Test (#175)	WARNING	OFF	test port PCSSpp l r 5
2817 (k)		Link GPP Loop (183) Against Links	MAJOR	ON	
3841 (l)		NONE			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 G3iV1.1-286 and G3iV2-386 only.

Notes:

a. Could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for faulty wiring, check for a defective data module, or reduce the cabling distance between the data module and the PBX (5000 feet for 24-gauge wire and 4000 feet for 26-gauge wire; see Note). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired automatically within 60 minutes.

   The DA module is not phantom-powered from the port and hence its range is limited by the Italtel digital phone's limit (0.7 km, 2300 feet, on 26-gauge wire or 1.8 km, 5900 feet, on 22-gauge, 0.6 mm, wire) if in **linked mode**, or by the maximum length of loop allowed from the Digital Line Interface (DLI) component (up to 3.5 km, about 2 miles, with 22-gauge, 0.6 mm, wire) if in **stand-alone mode**.

   NOTE:
   Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111.

b. This error type and auxiliary data occur when at least 15 off-board problems have been detected with the link to the data module. When an error with the link is detected, an on-board counter is incremented.

   The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for faulty wiring, check for a faulty data module, or reduce the cabling distance between the data module and the PBX (5000 feet for 24-gauge wire and 4000 feet for 26-gauge wire; see the next Note). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired automatically within 60 minutes.

   The DA module is not phantom-powered from the port and hence its range is limited by the Italtel digital phone's limit (0.7 km, 2300 feet, on 26-gauge wire or 1.8 km, 5900 feet, on 22-gauge, 0.6 mm, wire) if in **linked mode**, or by the maximum length of loop allowed from the Digital Line Interface (DLI) component (up to 3.5 km, about 2 miles, with 22-gauge, 0.6 mm, wire) if in **stand-alone mode**.

   NOTE:
   Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111.

c. This is an internal type error that occurs when an audit request fails.

d. This error type is logged when the port in question is busied out by maintenance personnel. Make sure that the port is released from busyout.

e. There are problems with transmitting to the data module. This is usually an on-board problem and can be ignored if no user complaints are received. Otherwise, check for faulty wiring.

f. This error indicates that EPF has been turned off due to the overcurrent condition at the data module. Make sure that the data module is connected. Look for faulty wiring or a defective data module, or reduce the cabling distance between the data module and the PBX (5000 feet for 24-gauge wire and 4000 feet for 26-gauge wire; see Note). If the problem still exists, it may be due to the fact that the PTC is in the "tripped" position due to a short on the power line. This can be corrected by removing the short, unplugging the data module from the wall for about 30 seconds, and plugging it back in. If the problem persists, replace the Digital Line circuit pack. Once the problem has been resolved, the alarm is retired after a predetermined period of time since this counter uses a "leaky bucket" strategy.

   The DA module is not phantom-powered from the port and hence its range is limited by the Italtel digital phone's limit (0.7 km, 2300 feet, on 26-gauge wire or 1.8 km, 5900 feet, on 22-gauge, 0.6 mm, wire) if in **linked mode**, or by the maximum length of loop allowed from the Digital Line Interface (DLI) component (up to 3.5 km, about 2 miles, with 22-gauge, 0.6 mm, wire) if in **stand-alone mode**.

   NOTE:
   Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111.

g. An in-line maintenance error has generated an off-board warning due to some problem with the link to the data module. This can be ignored if no user complaints are received. Otherwise, make sure the data module is connected, check for faulty wiring, check for a defective data module, or reduce the cabling distance between the data module and the PBX (5000 feet for 24-gauge wire and 4000 feet for 26-gauge wire, see Note). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired automatically within 90 minutes.

   The DA module is not phantom-powered from the port and hence its range is limited by the Italtel digital phone's limit (0.7 km, 2300 feet, on 26-gauge wire or 1.8 km, 5900 feet, on 22-gauge, 0.6 mm, wire) if in **linked mode**, or by the maximum length of loop allowed from the Digital Line Interface (DLI) component (up to 3.5 km, about 2 miles, with 22-gauge, 0.6 mm, wire) if in **stand-alone mode**.

   NOTE:
   Refer to the *DEFINITY Communications System Generic 1 and Generic 3i Wiring,* 555-204-111.

h. This indicates that the data equipment went off-hook while the associated link was being initialized (in a disconnected state). Use the **status data-module** command to determine the state of the data module. The off-hook should have changed the service state to in-service. No system technician action is necessary.

i. This is the resulting code that is generated when the link between the circuit pack and the data module is successfully reset. The link is normally reset when the circuit pack associated with an administered port is first plugged in (assuming that the data module is already in place and connected to the associated port), when a port is first administered (assuming the associated circuit pack is plugged in and that the data module is connected to the associated port), or when a data module is first connected to an administered port. No system technician action is necessary.

j. This warning off-board alarm occurs only for G3iV1.1-286 or G3iV2-386. The alarm occurs when it appears to the system that a DCP endpoint has been disconnected.

k. A DCP endpoint may have been disconnected.

l. This endpoint is part of processor link. Link initialization has failed (or demand test for #183 for PI links has failed) and is indicating the associated PDM as the cause. Check the PDM, the wiring to the PDM and the link to the far end (i.e. AUDIX DCS, etc.) to resolve the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Data Module Internal Loop Around Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Data Module Internal Loop Around Test (#175)		X	ND
Network Processing Element Crosstalk Test (#9)		X	ND
Information and Control Channel Loop Around Test (#13)		X	ND
Data Module Audits Test (#17)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#9)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. If a secondary data module is assigned, it is tested after the primary data module. If either test fails, both data modules are taken out of service This test usually runs only during the Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-246. TEST #9 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. 1. Check the port status. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **station status** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for this test. You must wait until the port is idle. 2. If the port status is idle, then retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the extension of the data module port. Use the **status data-module** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states). You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-246. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1001	ABORT	System resources to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.

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Table 11-246. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the extension of the data module port. Use the **status data-module** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states). You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	Test disabled via background testing. Use **status data-module** command to determine when the data module is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.
2020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort escalate the problem.

Continued on next page

Table 11-246. TEST #9 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal System Error. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.
1,2	FAIL	The NPE of the tested port was found to be transmitting in Error Log. This causes noisy and unreliable connections. Failure Code 1 indicates that the Crosstalk Test failed on the primary channel. Failure Code 2 indicates that the Crosstalk Test failed on the secondary channel. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times and verify that it continues to pass. 2. If complaints still exist, examine the data module, connections, and wiring.

Information and Control Channel Local Loop Test (#13)

This is a set of four tests that check the operation of the information and control channels used between the SPE and the Digital Line port circuit.

NOTE:
This is an Internal Loop Around test only and does not check building wiring. Use Test #175 for external loop around tests to the data module.

1. The SPE first sends a message to the on-board microprocessor to loop around both the information and control channels for the port. Then, the primary information channel loop back test is run. The test is performed by sending a digital count from the Tone-Clock circuit pack on the primary channel time slot and receiving the same digital count with a GPTD. The digital count looks like transparent data to the on-board microprocessor.
2. With the port still in loop around mode, the S channel Loop Around Test is performed next. This test consists of sending four different transparent patterns to the on-board microprocessor, receiving them back, and comparing them.
3. The third test is a Loop Around Test for the secondary (alternate) channel. It is not performed for data modules since this channel is not used by MPDMs, MTDMs, and stand-alone DA's [G3iV2-386].
4. A Conference Test is done next for the primary channel. This test is the same as the Analog Line Terminal/Port Conference Test (#6).

Only one value (Pass, Fail, or Abort) is generated as a result of four tests run. If any test fails or aborts, the sequence is stopped.

Table 11-247. TEST #13 Information and Control Channel Local Loop Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-247. TEST #13 Information and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run test are not available. Port may be busy with a valid call. Use **display port PCSSpp** command to determine the data module extension. Then use **status data module** command with the extension number to determine the service state of the data module. If the service state indicates that the data module is in use, then port is unavailable for certain tests. Wait until port is idle before retesting. 1. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-247. TEST #13 Information and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the command at one-minute intervals for a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the data module extension. Then use **status data module** command with the extension number to determine the service state of the data module. If the service state indicates that the data module is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-247. TEST #13 Information and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2001	ABORT	System resources required to run this test are not available. 1. Retry the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Rerun the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.
15	FAIL	The control channel between the processor and Digital Line circuit pack is not transmitting properly. This can cause a wide range of effects. The user may notice nothing or the port may be totally unusable. This could also disrupt other users. 1. Run circuit pack tests to check the Tone Generator and the Tone Detector circuit packs using the **test board UUCSS short** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Digital Line circuit pack.

Continued on next page

Table 11-247. TEST #13 Information and Control Channel Local Loop Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7	FAIL	Conference test failed on the primary information channel. In some cases, user may not notice disruption in service. In extreme cases, conferencing feature may not work at all.
14	FAIL	The primary information channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.
15	FAIL	The control channel between the processor and Digital Line circuit pack is not transmitting properly. This can cause a wide range of effects. The user may notice nothing or the port may be totally unusable. This could also disrupt other users. 1. Run circuit pack tests to check the Tone Generator and the Tone Detector circuit packs using the **test board UUCSS short** command. 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Digital Line circuit pack.
16	FAIL	The secondary information is not transmitting properly. This can cause a wide range of effects. The user may notice nothing or the port may be totally unusable. 1. To be sure that this is not an intermittent problem, repeat this test up to a maximum of 10 times to make sure it continues to pass. 2. If complaints still exist (poor data transmission), examine the data module, connections, and wiring.
	PASS	Information and Control Channel Local Loop Test passed. All channels are transmitting properly.

Data Module Audits Test (#17)

This is a series of six tests that are classified as hardware audits. The processor sends messages to the on-board microprocessor to perform the following tests. [G1] The audits run only if the station is in-service.

- Switchhook Inquiry — This is an update of the processor's software records based on the on-hook/off-hook status of the data module.
- Bad Scan Inquiry — A message is sent uplink that contains a count generated by certain events relating to the digital loop's (link) conditions. This could be an indication of communication problems between the processor and digital port circuit pack.
- EPF inquiry — The status of the EPF is sent uplink. EPF is not used for data modules.
- ID Request — A request is made to the data module for its status. The data module sends its configuration information and health information back. This information is checked and a pass/fail result is provided.
- Ringer Update — This updates the data module's ringer state according to processor records.
- Translation Update — This is a message normally used with digital stations to refresh the default value that causes the station to send touch-tones only in the primary information channel. This test is not used with data modules.

Table 11-248. TEST #17 Data Module Audits Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Switchhook audit timed out. 1. Verify the data module is connected to the PBX and repeat the test. 2. If the test aborts, replace the data module and repeat the test. 3. If the test continues to abort, replace the circuit pack and repeat the test. 4. If the test continues to abort, escalate the problem.
2	ABORT	ID request fails, health bit is defective, or no response from on-board microprocessor. 1. Verify that the correct data module type (PDM versus TDM) is administered. 2. If the test aborts, replace the data module and repeat the test. 3. If the test aborts, replace the circuit pack and repeat the test. 4. If the test continues to abort, escalate the problem.
3	ABORT	No response from EPF audit.
4	ABORT	Internal System Error. 1. Resolve any outstanding circuit pack maintenance problems. 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-248. TEST #17 Data Module Audits Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5	ABORT	Ringer update aborted (data module not in the in-service state). 1. Verify that the data module is powered (power LED on). 2. Make sure data module is connected to the building wiring, check for faulty wiring, check for faulty data module. 3. Retry the command at one-minute intervals a maximum of five times. 4. Replace the Data Module and repeat the test. 5. If the test continues to abort, replace the Digital Line circuit pack and repeat the test. 6. If the test continues to abort, escalate the problem.
6	ABORT	Data module translation update aborted. 1. Verify the data module is connected to the PBX. 2. Retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	Data Module Audits passed. This digital port circuit pack is functioning properly. 1. If complaints still exist, investigate by using other port tests, and by examining the data module options, wiring, and connections.

Data Module Internal Loop Around Test (#175)

This test verifies that a data message can be sent from the PBX, through the building wiring, through an internal looparound path in the data module under test, and back to the PBX. Figure 11-82 shows the hardware configuration used for this test.

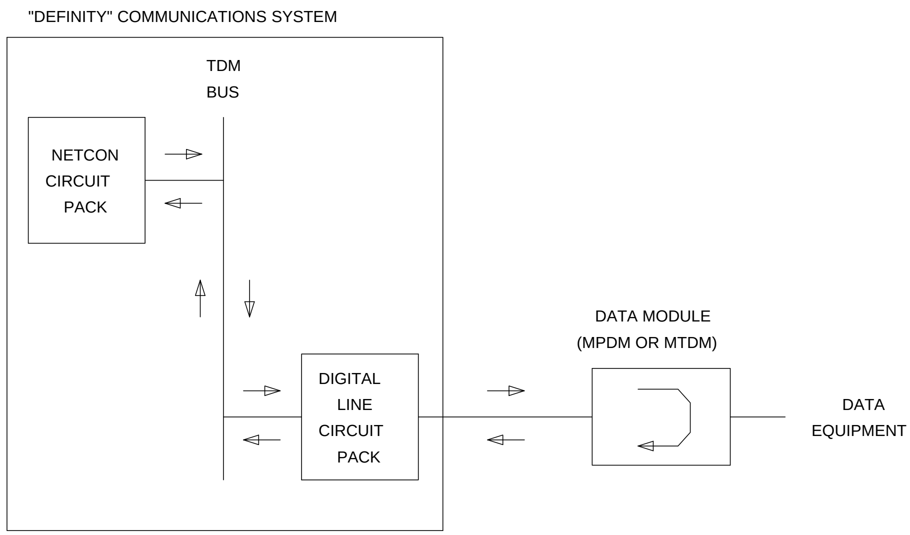

Figure 11-82. Internal Loop Around Test

A signaling message is sent through the digital port circuit pack to the data module under test to request it to enter loop around mode. A test pattern is then sent from the SPE through the Network Control circuit pack (Netcon), over the TDM Bus, through the digital port circuit pack, to the data module where the message is looped around, and sent back through the digital port circuit pack, the TDM Bus, the Network Control circuit pack, and to the SPE where it is checked for consistency.

This test aborts if no terminal or communications equipment is connected to the data module. It also aborts if a number of local PBX resources are not available. These resources include a network control channel from the Network Control circuit pack (there are a maximum of four channels administered as Netcon-type data modules), two TDM time slots (one for each direction of the loop around message), and an idle digital port circuit associated with the data module under test. Failure to allocate any of these resources causes the test to abort with a specific error code for that resource.

A "yes/no" parameter on each data module (MPDM, MTDM, or stand-alone DA only) administration form is required to specify if the Data Module remote Loop Around Test is supported by the data module endpoint. If the parameter is "n" (no), the test does not run.

Table 11-249. TEST #175 Data Module Internal Loop Around Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	Could not get translation information for port. 1. Verify that port circuit is administered. 2. Wait one minute and attempt the test again. 3. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	This test is not applicable to the given hardware configuration. 1. This abort message can be ignored.
1020	ABORT	Internal Software Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1030	ABORT	Internal software group identifier for data module not valid. 1. Verify that port circuit is administered correctly. 2. If administration data correct, escalate the problem.
1031	ABORT	Extension number not valid.
1032	ABORT	Extension number not correct length. 1. Verify that the data module extension is administered correctly. 2. If the administration data is correct, escalate the problem.

Continued on next page

Table 11-249. TEST #175 Data Module Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1071	ABORT	No auxiliary port on Netcon circuit pack available to test with. 1. Check that the Netcon data channels are administered (the **list data-modules** command should show at least one Netcon-type data module). 2. Test the Network Control (Netcon) circuit pack using the **test data-module** command for the Netcon circuit pack. 3. If administration data is correct, escalate the problem.
2000	ABORT	Data module disconnected. 1. Verify that the data module is powered (power LED on). 2. Make sure data module is connected to the building wiring. Check for faulty wiring and faulty data module. 3. Retry the command at one-minute intervals a maximum of five times. 4. Replace the Data Module and repeat the test. 5. If the test continues to abort, replace the Digital Line circuit pack and repeat the test. 6. If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-249. TEST #175 Data Module Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3004	ABORT	1. This error could be caused by the switch setting of the PDM. Verify that the switch on the PDM is set to the "remote loop" position. When the remote loop around test is completed, return the switch to the "off" position. 2. This error could be caused by the Network Control Data Channel. Look for DATA-CHL errors in the Hardware Error Log. 3. This error could also result if no data equipment is connected to the data module. Verify that (a) the data equipment is properly connected to the data module, (b) that power is available to the data equipment, and that (c) the data equipment is powered on. 4. This error could also occur if the baud rate of the data module is set to 19.2 Kbps since the Network Control circuit pack used by this test does not support baud rates greater than 9600 bps. Verify that the baud rate of the data module is set to 9600 bps or less.
1040	FAIL	Data received from remote loop back does not match data sent. 1. Check for faulty wiring. 2. Replace the data module and repeat the test. 3. If the test fails, replace the Digital Line circuit pack associated with the data module and repeat the test. 4. If the test continues to fail, escalate the problem.
1070	FAIL	Internal software response. 1. Wait one minute and attempt the test again. 2. If the same error persists after five attempts in one-minute intervals, escalate the problem.

Continued on next page

Table 11-249. TEST #175 Data Module Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1072	FAIL	Poor response from auxiliary channel. 1. Test the Network Control (Netcon) circuit pack using the **test data-module** command. 2. If the test fails, replace the Digital Line circuit pack. 3. If the test continues to fail, escalate the problem.
1073	FAIL	Internal System Error. 1. Wait one minute and attempt the test again. 2. If the same error persists after five attempts in one-minute intervals, escalate the problem.
1074	FAIL	Internal System Error. 1. Make sure that the data equipment connected to the data module is powered. 2. For an (M)PDM, verify that the Data Terminal "Ready" LED is ON, or for an (M)TDM, verify that the Data Set Ready LED is ON. If it is not on, check the cable from the data equipment to the data module. 3. If the test continues to fail, escalate the problem.
1075	FAIL	Unknown message received during test. 1. Attempt the test again. 2. If the same error occurs, test the Network Control Data Channel using the **test data-module** command and a known working data module. 3. Replace the Digital Line circuit pack and repeat the test. 4. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-249. TEST #175 Data Module Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2040	FAIL	Internal System Error.
2095	FAIL	Internal System Error. 1. Repeat the test. 2. If the test continues to fail, escalate the problem.
	PASS	Data Module Loop Around Test passed. This digital port circuit pack is functioning properly. 1. If problems persist, investigate by using other port tests and by examining the data module options, wiring, and connections.

PE-BCHL (PRI Endpoint Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PE-BCHL[1]	MINOR	test port PCSSpp l	PRI Endpoint Port
PE-BCHL	WARNING	test port PCSSpp sh	PRI Endpoint Port

1 For additional repair information, see also UDS1-BD (UDS1 Interface Circuit Pack) Maintenance documentation and "Troubleshooting PRI Endpoint Problems" in Chapter 5, "Routine Maintenance Procedures".

A PRI Endpoint provides ISDN-PRI (Primary Rate Interface) connections for customers with application equipment or terminal adapters that terminate ISDN-PRI. The equipment or terminal adapters are connected to the switch via the UDS1 interface circuit pack. PRI Endpoint Port (PE-BCHL) maintenance provides a strategy to maintain PRI Endpoint Port hardware circuitry on the UDS1 circuit pack. The maintenance strategy involves logging PRI Endpoint Port hardware errors, running tests for port initialization, periodic and scheduled maintenance, system technician-demanded tests, and alarm escalation and resolution.

Wideband Switching

The Wideband Switching capability supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. DEFINITY switching capabilities are extended to support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

The Wideband Switching capability is designed for ISDN application equipment (for example, ISDN video codecs), but it retains provisions for non-ISDN application equipment by using PRI terminal adapters. In the same sense that a DEFINITY data module acts as a DCP or BRI terminal adapter between endpoint data (for example, V.35) and dialing (for example, RS-366) interfaces and a DCP interface, a PRI terminal adapter acts as a wideband terminal adapter between endpoint data and dialing interfaces and DEFINITY's line-side ISDN PRI interface.

The Wideband Switching Capability introduces PRI Endpoints on DEFINITY line-side interfaces. A PRI Endpoint consists of one or more contiguous B-channels on a line-side T1 or E1 ISDN PRI facility, and it has an extension number. Endpoints initiate and receive calls via ISDN SETUP messages that indicate the data rate and specific B-channels to be used, and they communicate all other call status information via standard ISDN messages. Any

DEFINITY ISDN signaling set (for example, AT&T, CCITT, ECMA) may be used for a line-side ISDNPRI facility.

Multiple PRI Endpoints on a one line-side facility are separate and distinct within the facility. Non-overlapping contiguous sets of B-channels are associated with each PRI Endpoint, and the endpoint equipment is expected to initiate calls within these boundaries.

The endpoint application equipment must be able to do the following: use standard ISDN-PRI signaling, adhere to the PRI Endpoint boundaries as administered on DEFINITY when initiating calls, and handle incoming calls appropriately based on the PRI Endpoint.

Signaling and B-channel States

These ports use a separate channel for signaling (for example, for call setup). This mode of operation is known as out-of-band signaling. The separate signaling channel is called a D-channel in ISDN terminology, and it carries all the call control signaling messages for the PRI Endpoint Port B-channels. The D-channel for these B-channels is an ISDN-PRI Signaling Link Port (ISDN-LNK). The signaling protocol used on the ISDN-PRI Signaling Link Port D-channel is defined by one of the four selectable ISDN-PRI Specifications: AT&T, CCITT, ECMA, and ANSI.

The ISDN-PRI Specification defines the possible SERVICE STATES for a B-channel. The service state is negotiated with the far-end terminal adapter, and it changes over time. Also, the service state may have a far-end or near-end component, and it is initialized to the Out-Of-Service/Far-End state. An attempt is made to negotiate the service state to In-Service.

NOTE:
The service state of a particular PRI Endpoint Port B-channel can be displayed by issuing the **status pri-endpoint <extension>** system technician command.

If a call is present, the ISDN-PRI Specification defines the permissible CALL STATES as well. There are tests in the short and long test sequences for PRI Endpoint Port that are designed to audit these states and to ensure agreement between both ends of the PRI wideband connection.

Alarming based on Service States:

A PRI Endpoint Port B-channel is alarmed with a WARNING if it is placed into a Maintenance/Far-End or Out-Of-Service/Far-End state. While in such a state, the port is unusable for calls to the terminal adapter. However, the user can still use the other remaining ports in the PRI Endpoint to make calls to and from the terminal adapter. When a WARNING alarm is raised, the **status pri-endpoint <extension>** command should be used to determine the exact state of the port.

Other alarms can be diagnosed by using the short and/or long test sequences. Note that a PRI Endpoint Port B-channel can be placed into a Far-End Service State either by direct action of the far-end terminal adapter or by inaction of the far-end terminal adapter. For example, if they do not respond to a Remote Layer 3 Query (see Test #260 for ISDN-PRI Signaling Link Port), the associated PRI Endpoint Port B-channels are placed into the Maintenance/Far-End service state.

A PRI Endpoint Port is a port on a UDS1 interface circuit pack. Therefore, this port depends on the health of the UDS1 interface circuit pack for proper operation (see Figure 11-83). As noted earlier, a PRI Endpoint Port B-channel also depends on an ISDN-PRI Signaling Link Port D-channel (ISDN-LNK) to carry the signaling traffic. If there is a problem with the ISDN-PRI Signaling Link Port, the PRI Endpoint Port is affected. The ISDN-PRI Signaling Link Port, in turn, depends on the PI-LINK (Processor Interface Link). Processor Interface Link problems affect the ISDN-PRI Signaling Link Port. Keep this hierarchy of dependencies in mind when diagnosing problems.

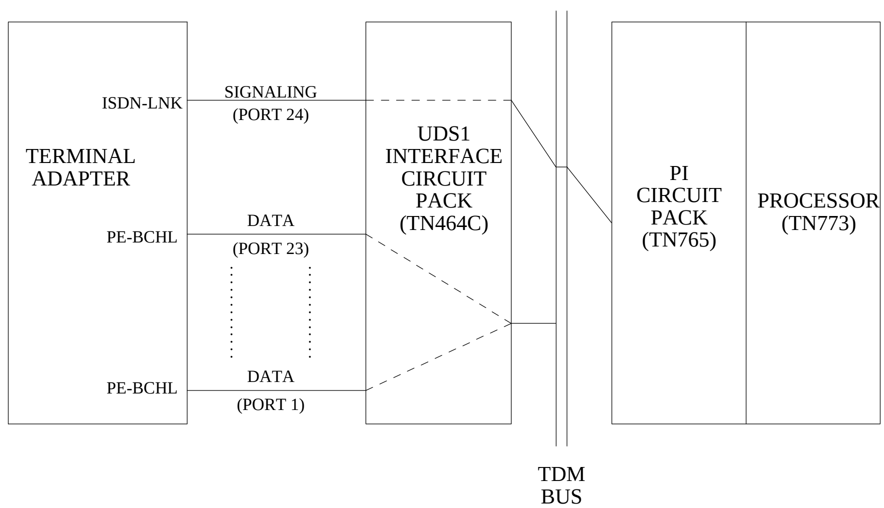

Figure 11-83. PRI Endpoint Port Interactions [INTEL]

PRI Endpoint Port Service States

This section defines the possible service states of a PRI Endpoint Port, and it explains the reason for each service state. This section also provides the recommended recovery procedures (when required).

Service States

- In-Service (INS)

  The B-channel is in its normal operating state.

- Out-of-Service/Far-end (OOS/FE)

  A B-channel is initialized to this state when administered. The switch sends messages to the far-end terminal adapter to negotiate the B-channel into service. If the far-end terminal adapter does not respond to the messages within a certain time period, the service state remains out-of-service, and maintenance periodically resends the messages. The port is unusable for calls incoming to the switch and outgoing to the terminal adapter (although other ports in the PRI Endpoint can still be used for incoming and outgoing calls).

- Out-of-Service/Near-end (OOS/NE)

  This is the state of the port whenever one of the following is true: a hardware failure exists on the signaling link, the NPE Crosstalk Test fails, or the port is busied out by system technician. In this state, the port is unusable for calls incoming to the switch or outgoing to the terminal adapter (although other ports in the PRI Endpoint can still be used for incoming and outgoing calls). No messages are sent to the far-end terminal adapter until the signaling link comes back into service or until the port is released by system technician.

- Maintenance/Far-end (MTC/FE)

  This state is reached when the far-end terminal adapter does not respond to messages sent over the signaling link for a particular port after a certain amount of time. This state is different from OOS/FE inasmuch as the signaling link must be up initially and the B-channels must be in-service. The switch periodically sends messages to the far-end terminal adapter in an attempt to negotiate the port (B-channel) into service. The port is unusable for calls outgoing to the terminal adapter. However, the port services incoming call requests from the far-end (although other ports of the PRI Endpoint can still be used to answer calls incoming to the switch or to place outgoing calls to the terminal adapter). Note that transitions into MTC/FE do not drop stable calls. Therefore, if the service state changes from in-service to MTC/FE, stable calls are unaffected.

- Maintenance/Near-end (MTC/NE)

  The port (B-channel) is in this state if the signaling link (PI-LINK) is busied out by system technician. The port (B-channel) is also temporarily in this state if the system technician has issued a **test port PCSSpp l** or a **test**

pri-endpoint <extension> l command. Note that transitions into MTC/NE do not drop stable calls. Therefore, a system technician-demanded **busyout link lnk-no** command does not drop stable wideband calls. In this state, the B-channel is not usable either for new calls incoming to the switch or for new calls outgoing to the terminal adapter.

- Pending States (PEND)

  If the near-end is expecting a timed response from the far-end for a request to change the service state of a port, the state of the port reflects a Pending state. For example, if the port is out-of-service/far-end and if an in-service message is sent to the far-end, the service state of the port is OOS/FE-PEND/INS (that is, out-of-service/far-end-Pending/in-service). The far-end has a certain amount of time to respond to the message. The service state reflects this pending state until the timer expires.

The following diagram of the PRI Endpoint Port service states shows the common progression from one service state to another and the event that caused the change of state.

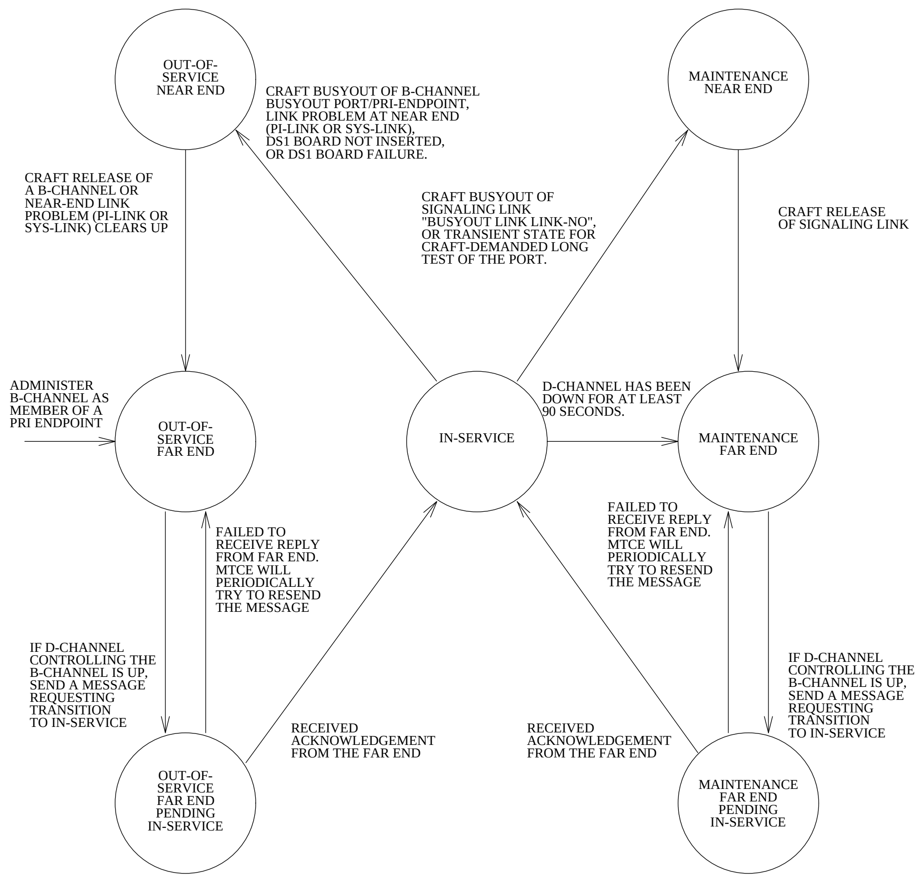

Figure 11-84. Common Progressions in Service States

PRI Endpoint Port Service States

The following chart summarizes each of the different PRI Endpoint Port service states that can result when the **status pri-endpoint <extension>** command is issued. From the results of the status command, match the service state to the corresponding column. Proceed down the column until an "X" is found. The left column indicates possible reasons why the port is in this state, and the right column suggests possible recovery mechanisms. If an alarm against PE-BCHL is present, it is indicated below the "X."

NOTE:
Refer to "Troubleshooting PRI Endpoint Problems" in Chapter 5, "Routine Maintenance Procedures" for a layered approach to the processing of PRI Endpoint problems.

Table 11-250. PRI Endpoint Port Service States

Possible Problem Source	O/S-NE	O/S-FE	O/S-FE Pend-ins	maint -NE	maint-FE	maint-FE Pend-ins	INS	Possible Recovery Route
ISDN wideband calls being completed.							X	Normal Operation.
Port busied out by system technician?	X Warning Alarm							Release port via **release pri-endpoint extension** or **release port PCSSpp**.
NPE Crosstalk Test failed?	X Minor Alarm							Replace UDS1 Interface CP.
DS1 circuit pack lost signal?	X							UDS1 Interface CP removed? DS1 cable disconnected? Terminal adapter problems? Far-end terminal adapter restarting? Faulty UDS1 Interface CP?
Check UDS1-BD.								Refer to UDS1-BD for repair procedures.
Far-end problems?		X Warning Alarm						Check administration and the status of the corresponding port on the far-end terminal adapter.
Service Message sent, waiting for reply from far-end terminal adapter (2 minutes).			X			X		Wait a couple minutes until Pending State not present, check service state.

Continued on next page

Table 11-250. PRI Endpoint Port Service States — *Continued*

Possible Problem Source	O/S-NE	O/S-FE	O/S-FE Pend-ins	maint -NE	maint-FE	maint-FE Pend-ins	INS	Possible Recovery Route
Processor Interface Link busied out by system technician? Check link status. [MIPS only].				X				Release link via **release link lnk-no.**
Signaling link has been down for over 90 seconds?					X Warning Alarm			See ISDN-SGRP, ISDN-LNK, PI-LINK and/or SYS-LINK and follow repair procedures. Is far-end terminal adapter currently restarting?
Repeated failure of far-end to respond to messaging?					X Warning Alarm			Periodically Maintenance will try to resend messages. To speed process, run system technician-demanded test **test port PCSSpp** (Test #256).
Far-end port busied out (OOS/FE). Far-end port being tested (MTCE/FE).		X Warning Alarm			X Warning Alarm			Check status of far-end terminal adapter.

Hardware Error Log Entries and Test to Clear Values

PRI Endpoint Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1 (a)	Any	None			test port PCSSpp sh r 1
15 (b)	Any	Audit and Update Test (#36)			
18 (c)	0	busyout pri-endpoint <extension> busyout port <PCSSpp>	WARNING	OFF	release pri-endpoint <extension> release port <PCSSpp>
129 (d)		None	WARNING	OFF	test port PCSSpp sh r 1
130 (e)		None	WARNING	ON	test port PCSSpp sh
257 (f)	Any	None			test port PCSSpp sh r 1
513 (g)	Any	None	WARNING	OFF	test port PCSSpp sh r 1
769 (f)	Any	None			test port PCSSpp sh r 1
1281 (h)	Any	Conference Circuit Test (#7)	MINOR	ON	test port PCSSpp l r 4
1537 (i)	Any	NPE Crosstalk Test (#6)	MINOR	ON	test port PCSSpp l r 3
1793 (j)	Any	None			test port PCSSpp sh r 1
3073 (k)	Any	Service State Audit (#256)			test port PCSSpp sh r 2
3585 (l)	Any	None			None

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error type indicates a disagreement between the switch and the terminal adapter at the other end of the connection with regard to the ISDN *call* state of the PRI Endpoint Port. This switch automatically tries to recover by clearing the call (that is, the call is torn down). The **status pri-endpoint <extension>** command can be used to determine the state of the port.

When running the Short Test Sequence of tests, pay close attention to the results of the Call State Audit Test (#257).

b. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate the associated errors (if any).

c. The PRI Endpoint Port has been busied out by a **busyout pri-endpoint <extension>** command or by a **busyout port <PCSSpp>** command. No wideband calls can be made to this port (although wideband calls can still be made to other ports within this PRI Endpoint if others ports are in service).

d. The far-end terminal adapter changed its ISDN *service* state to either "out-of-service" or "maintenance." This may be a temporary condition due to the testing of this port by the far-end terminal adapter *or* by a hardware problem with the port. Outgoing calls to the terminal adapter are not allowed over the port (although calls can still be made to other ports that are in service within the same PRI Endpoint). To investigate the status of the port, issue the **status pri-endpoint <extension>** command.

e. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

f. This error type indicates a disagreement between this switch and the terminal adapter at the other end of the connection with regard to the ISDN service state of the PRI Endpoint Port. This switch tries to recover by performing a service state audit. The **status pri-endpoint <extension>** command can be used to determine the state of the port.

   When running the Short Test Sequence, pay close attention to the results of the Service State Audit Test (#256).

g. This port is not recognized by the far-end terminal adapter. Investigate the PRI Endpoint administration for both the switch and the terminal adapter and make changes as necessary.

h. The Conference Circuit Test (#7) failed on this port. See Test #7 for the repair procedures.

i. The NPE Crosstalk Test (#6) failed on this port. See Test #6 for the repair procedures.

j. This error indicates a failure of the UDS1 Interface circuit pack. When running the Short Test Sequence, the results of the Signaling Link State Check Test (#255) are important.

k. Two Service State Audit attempts have failed (see Test #256). The port is not usable for any outgoing calls to the terminal adapter (although incoming calls from the terminal adapter are accepted over this port, other ports in the PRI Endpoint can still be used for both incoming and outgoing calls to and from the terminal adapter) until the test passes and the port state is changed to in-service (use the **status pri-endpoint <extension>** command to investigate the port status).

l. This error type appears when the switch receives an ISDN RESTART message for an ISDN port that is not idle. Usually, calls are not cleared via the RESTART message. Therefore, this error type may be associated with a dropped call report from a user.

The following Aux Data values for Error Type 3585 represent the port's ISDN call state at the time that the unexpected request to restart the channel is received from the remote terminal adapter. This information can be useful if dropped calls (cutoffs) are being reported by users of the PRI Endpoint.

The following list contains important Aux values. Any other such values can be ignored.

10	A call in a stable, talking state was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message. This state is called the "active" state.
4, 7, 8, 260, 263	A call that did not reach the active state but at least reached a ringing state was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
1, 3, 6, 9, 265	A call that has not yet reached a ringing state was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
11, 12, 19, 531, 267, 268	A call that was in the process of clearing has been nonetheless cleared by the far-end terminal adapter with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far-end terminal adapter is attempting to clear ports that it thinks are in a "hung" state. The RESTART message brings the port to an idle condition.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Audit and Update Test (#36)	X	X	ND
Signaling Link State Check Test (#255)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. (The TN464C UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.) The NPE controls port connectivity and gain, and it provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and that it never crosses over to time slots that are reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's long test sequence, and it takes about 20 to 30 seconds to complete.

Table 11-251. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status pri-endpoint <extension>** commands to determine when the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-251. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM Bus errors. The **status health** command can be used to determine if the system is experiencing heavy traffic. Refer to TDM Bus Maintenance to diagnose any active TDM Bus errors. 1. If system has no TDM Bus errors, and if it is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. The **list measurements tone-receiver** command displays information on the system's tone receiver. 1. Look for TTR-LEV errors in the Error Log. If errors are present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If errors are present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use **status pri-endpoint <extension>** commands to determine when the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1117	ABORT	A service state audit message is outstanding. 1. Wait two minutes and then try again.

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Table 11-251. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2020	ABORT	The test did not run due either to an already existing error on the specific port or to a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. The PE-BCHL is moved to the out-of-service/near-end state. 1. Replace the circuit pack.
	PASS	The port is able to communicate over the TDM Bus.

Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. (The TN464C UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.) The NPE controls port connectivity and gain, and it provides conferencing functions on a per port basis. The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and to conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 11-252. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status pri-endpoint <extension>** command to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status pri-endpoint <extension>** command to determine when the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.
1020	ABORT	The test did not run due either to an already existing error on the specific port or to a more general circuit pack error. 1. Examine Error Log for existing errors against this port or against the circuit pack, and attempt to diagnose the already existing error.

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Table 11-252. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. 1. Replace the circuit pack. Even though wideband calls do not use the conferencing feature on the NPE, this failure indicates problems with the circuit pack hardware.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using the other port tests and by examining the terminal adapter or the external wiring.

Audit and Update Test (#36)

This test sends port level translation data from the switch processor to the UDS1 interface circuit pack to ensure that the port's translation is correct. The port audit operation verifies the consistency of the current state of the port that is kept in the UDS1 interface circuit pack and in the switch software.

Table 11-253. TEST #36 Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	The test failed due to internal system error. 1. Retry the command at one minute intervals a maximum of 5 times. 2. If the test continues to fail, escalate the problem.
	PASS	The port translation has been updated successfully. The current port states kept in the UDS1 interface circuit pack and in the switch software are consistent. If the port is busied out, the test does not run, but returns PASS. To verify that the port is in-service: 1. Enter **status pri-endpoint <extension>** to verify that the port is in-service. If the port is in-service, no further action is necessary. If the port is out-of-service, go to Step 2. 2. Enter the **release pri-endpoint <extension>** command or the **release port <PCSSpp>** command to put the port back into in-service. 3. Retry the test command.

Signaling Link State Check Test (#255)

As is noted in the general description for a PRI Endpoint Port, the operation of the PRI Endpoint Port depends on the health of the UDS1 interface circuit pack and of the TN765 Processor Interface Link. This test checks the status of those critical elements.

Table 11-254. TEST #255 Signaling Link State Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete the test on this port, do one of the following: 1. Re-attach the disconnected PRI terminal adapter, or 2. Disable the rollabout video feature on this circuit pack by entering the **change ds1 PCSS** command, and set the field "Alarm when PRI Endpoint Detached?" to "y."
4	FAIL	There is a problem with the Signaling Channel and/or with the Processor Interface Link. 1. Consult the procedure for the ISDN-PRI Signaling Group (ISDN-GRP) and/or the procedures for Processor Interface Link (PI-LINK). Further information may also be obtained by consulting the procedures for the ISDN-PRI Signaling Channel (ISDN-LNK).
8	FAIL	There is a problem with the UDS1 interface circuit pack. 1. Consult the procedures for UDS1 interface circuit pack (UDS1-BD).
	PASS	The signaling link hardware is okay.

Service State Audit (#256)

As is noted in the general description for PRI Endpoint Port, these ports may be in one of several service states as defined by the ISDN-PRI Specification. This test performs a service state audit with the far-end terminal adapter to ensure that both sides agree on the service state.

A PASS for this test simply means that an audit message was successfully composed and sent out to the far-end terminal adapter. The ISDN Specification allows up to two minutes for a reply. If no reply is received within that two minute window, this switch automatically tries once again. If that attempt fails, an error is logged (Error Type 3073), and the switch attempts a recovery by automatically retrying approximately every 15 minutes. If the port was initially in the INS (in-service) state, it is now placed into the MTC/FE (maintenance state, far-end problem) state. Until a Service State Audit attempt is successful, no outgoing calls are placed over this port, but incoming calls are be accepted. The service state of this port does not affect the service state of other ports in the PRI Endpoint. If an incoming call that uses this port is presented while in such a state, a Service State Audit attempt is immediately attempted (that is, the switch does not wait for the 15 minute cycle, but instead tries to recover immediately). To investigate the status of this PRI Endpoint Port, issue the **status pri-endpoint <extension>** command.

Table 11-255. TEST #256 Service State Audit Test

Error Code	Test Result	Description/ Recommendation
1113	ABORT	The signaling link has failed. As a result, the system cannot send any messages on behalf of this port. 1. Check the results of Test #255 (Signaling Link State Check).
1117	ABORT	A service state audit message is outstanding. 1. Wait two minutes and try again.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete the test on this port, do one of the following: 1. Re-attach the disconnected PRI terminal adapter, or 2. Disable the rollabout video feature on this circuit pack by entering the **change ds1 PCSS** command, and set the field "Alarm when PRI Endpoint Detached?" to "y."

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Table 11-255. TEST #256 Service State Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	Wait four minutes and then check the Error Log for any new occurrences of Errors Type 3073. If there are no occurrences of this error type, both sides of the ISDN connection agree on the service state, and the negotiation succeeded. If there is a new occurrence of Error Type 3073, the negotiation failed (that is, the far-end terminal adapter twice failed to respond within the mandatory two minute window). This switch automatically retries approximately every 15 minutes. If the port was initially in the INS (in-service) state, it is now be placed into the MTC/FE (maintenance, far-end problem) state (refer to the "Service States" section, which precedes the PE-BCHL "Hardware Error Log Entries and Test to Clear Values" table). Incoming calls are accepted, but no outgoing calls are originated from this port. If an incoming call is presented, another Service State Audit is immediately performed in an attempt to bring the PRI Endpoint Port to the proper state.

Call State Audit Test (#257)

If a call is active on the port, the switches on both sides of the connection should agree on the ISDN state of the call as defined in the ISDN Protocol Specification. This test audits internal call state data by querying the far-end terminal adapter about the ISDN state of the call. It can be helpful when trying to clear a hung call. If the internal call state data on the near-end switch is different than that of the far-end terminal adapter, **the call is torn down.**

As with Test #256 (Service State Audit), a PASS simply means that an appropriate message was composed and sent to the far-end terminal adapter. The ISDN Specification allows up to two minutes for a reply. If a reply is not received within the two minute window, a protocol time-out violation is recorded in the error log against the associated signaling channel (ISDN-PRI Signaling Link Port, which is listed in the Error Log as ISDN-LNK; the Error Type is 1).

Table 11-256. TEST #257 Call State Audit Test

Error Code	Test Result	Description/ Recommendation
1019	ABORT	An audit is already in progress. 1. Wait two minutes and try again.
1113	ABORT	The signaling link has failed. As a result, the system cannot send any messages on behalf of this port. 1. Check the results of Test #255 (Signaling Link State Check).
1116	ABORT	The port is in an out-of-service ISDN service state. 1. A call cannot be present if the port is in an ISDN out-of-service state. As a result, a call state audit would be inappropriate, and no action is necessary. (Use the **status pri-endpoint <extension>** command to investigate the ISDN state of the port).
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. To complete the test on this port, do one of the following: 1. Re-attach the disconnected PRI terminal adapter, or 2. Disable the rollabout video feature on this circuit pack by entering the **change ds1 PCSS** command, and set the field "Alarm when PRI Endpoint Detached?" to "y."

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Table 11-256. TEST #257 Call State Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	This switch sent a call state auditing message to the far-end terminal adapter to verify the state of the call active on this port. If a call state mismatch is found, the call is torn down within two minutes. If no call was active, no message was sent.

PI-BD (Processor Interface Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
PI-BD	MINOR	test interface PCS sh	Processor Interface Circuit Pack
PI-BD	WARNING	test interface PCS sh	Processor Interface Circuit Pack

1 Where P is the port network number (1 for PPN only); C is the carrier designation (for example, A or B for processor complex circuit packs); and S is the address of the slot in the carrier where the circuit pack is located (for example, 1 or 2 for either the first or second Processor Interface circuit packs).

The TN765 Processor Interface (PI) circuit pack provides a front-end processor to the TN777 Processor circuit pack. The PI circuit pack implements the packet layer and link layer of the X.25 protocol (DCS, AUDIX, CMS, OCM links) as well as the link layer of the ISDN-PRI protocol (ISDN links). A G1, G3iV1.1-286, or G3iV2-386 system without High or Critical Reliability supports up to two circuit packs. A High or Critical Reliability system supports up to four Processor Interface circuit packs, two in each carrier. Only one pair of the circuit packs on a single carrier can be active at a given time. The other two are in Standby mode. The TN765 is a downloadable circuit pack. This means that at reboot, system power-up, or via system technician command, Processor Interface firmware is downloaded to the circuit pack. For other restarts, a Checksum Test is performed on the firmware. If the Checksum Test fails, then the firmware is downloaded again. The firmware can be automatically downloaded at any time via the **reset interface PCS** system technician command.

On the Active SPE complex or in an unduplicated system, Processor Interface maintenance is mainly used for alarming the circuit pack. If System Communication Interface (PI-SCI) finds an error or alarm condition that can be associated with an on-board problem with the Processor Interface (PI-BD) circuit pack, then it alarms both the System Communication Interface and the Processor Interface circuit pack. Processor Interface circuit pack maintenance is also used to test the common circuit pack functions on the circuit pack. If these tests fail, a circuit pack level alarm is raised on the Processor Interface circuit pack (PI-BD). Port level alarms are raised against PI-PT. See PI-PT (Processor Interface Port) Maintenance documentation for details.

On the Standby SPE complex, the testing of the Processor Interface circuit pack is different. The Standby Processor Interface circuit pack is tested daily via scheduled maintenance or on system technician demand. These tests are to check the Standby PIs hardware and firmware so that if an SPE interchange takes place, the Processor Interface communication links (DCS, ISDN, or AUDIX, for example) recover on the new Active Processor Interface circuit pack in a short time. Since the Processor Interface firmware is downloadable, if the firmware checksum fails during scheduled maintenance, then the circuit pack can be downloaded again at this time instead of during the SPE interchange. The Processor Interface firmware can be unconditionally downloaded to the Standby SPE circuit pack via the **reset interface PCS** command, where PCS is the carrier/slot of a Standby PI. The command executes the Standby Processor Interface Board Test (#423), but with a download option.

The Active Processor Interface circuit pack is tested in the PI-SCI (System Communication Interface) Maintenance documentation. Refer to that section for details. The test command is **test interface PCS** where PCS is the port network number, carrier, and slot of one of the Standby Processor Interface circuit packs. If the Standby Processor Interface circuit pack is tested, the test sequence for the Standby Processor Interface is followed. If the Active Processor Interface circuit pack's PCS is given, then tests in the Active Processor Interface test sequence are run. On the Active PI, if there are no enabled Processor Interface links on the Communication-Interface Links Form, only the XXX-BD (Common Port Circuit Pack) tests execute.

Hardware Error Log Entries and Test to Clear Values

The following indicates entries that may be found in the Error Log for Processor Interface circuit packs. Since the Processor Interface circuit pack has Common Port Circuit Pack functionalities, then cross reference XXX-BD (Common Port Circuit Pack) Maintenance documentation for more information. Test #423 is the only test that is described in this section. XXX-BD (Common Port Board) Maintenance describes the other tests mentioned in the following table.

PI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test interface PCS sh r 1
1 (a)	0	Circuit pack removed or SAKI Test (#53)	MINOR	ON	
23 (b)	0	None	WARNING	OFF	
54 (c)	0	None	MAJOR	ON	test interface PCS l
124 (d)	Any	None	MAJOR	ON	test interface PCS l
125 (e)		None	MINOR	ON	
257	65535	Control Channel Test (#52)	MINOR	ON	test interface PCS
257 (f)	Any	None			
513 (g)	Any	None			
769 (h)	4358	None			
1025 (i)	4363	NPE Audit Test (#50)			test interface PCS sh
1538 (j)	Any	None	MINOR	ON	
3585 (d)	Any	None Test (#423)	MAJOR	ON	reset interface PCS l
3840 (i)	Any	None			
3841	Any	Standby PI Circuit Pack Test (#423)	MAJOR	ON	test interface PCS sh
3999(k)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

WARNING:

7The "test interface long" command resets the PI-BD and cause all ISDN-PRI and BX.25 links to come down.

Notes:

a. This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

   NOTE:
   The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

   If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, then replace the circuit pack. See **CAUTION** statement below. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack.)

   CAUTION:
   Reseating the circuit pack may cause a system restart if the circuit pack is located on an Active SPE complex.

   If this is a Duplicated Option system, verify that there is an equal number of Processor Interface circuit packs in each SPE complex. If there is not an equal number of Processor Interface circuit packs, this condition could cause alarms on the STBY-SPE, DUPINT, SHDW-CIR, as well as the PI-BD.

b. The circuit pack has been logically administered but not physically installed. If this alarm remains active for more than 30 minutes, follow the normal escalation procedures. **DO NOT PHYSICALLY RESEAT THE CIRCUIT PACK!** The alarm is cleared when the circuit pack is installed and initialization maintenance runs on it. The Standby Processor Interfaces alarm is cleared when Standby maintenance runs on it.

c. Processor Interface-SCI detected an error while trying to reset the TN765 PI circuit pack. This error indicates a loss of communication with the circuit pack. If this error continues, then replace the TN765 circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack. See PI-SCI Maintenance documentation for additional errors.

d. PI-SCI logged errors that resulted in an error being logged and an alarm being raised against PI-BD. Refer to the PI-SCI Maintenance documentation and resolve all alarms against PI-SCI. If this alarm resulted in an SPE-interchange, issue the **test interface PCS sh** command to try to resolve the PI-BD alarm.

e. A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to re-administer this slot to match the circuit pack inserted.

f. This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

g. This error, when reported with Aux Data in the range of 4352 to 4358, indicates the circuit pack has reported a hardware failure on the circuit pack. The circuit pack should be replaced. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack.

h. This error can be ignored, but look for other errors on this circuit pack.

i. This error is not service-affecting and no action is required.

j. The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The common circuit pack level tests such as Test #51 and/or Test #220 are aborting with Error Code 2000.

   2. The tests run on the ports of this circuit pack are returning with a NO-BOARD.

   3. A **list configuration** command shows that the circuit pack and ports are properly installed.

   The system tries to restore the circuit pack within 15 minutes. If the error recurs after 15 minutes, replace the circuit pack. (Refer to the "Handling Control Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures".)

k. Error type 3999— Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Standby Processor Interface Circuit Pack Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Standby Processor Interface Circuit Pack Test (#423)	X	X	ND
Standby Processor Interface Port Test (#404) (a)	X	X	ND
Control Channel Loop Test (#52)	X	X	ND
NPE Audit Test (#50)	X	ND	

1 D = Destructive; ND = Nondestructive

a. This test is repeated up to four times since there are four ports on the circuit pack. Cross-reference PI-PT (Processor Interface Port) Maintenance documentation for information about these tests.

Control Channel Loop Around Test (#52)

Refer to the repair procedure described in the XXX-BD (Common Port Circuit Pack) Maintenance documentation as Control Channel Loop Around Test (#52).

NPE Audit Test (#50)

Refer to the repair procedure described in the XXX-BD (Common Port Circuit Pack) Maintenance documentation as NPE Audit Test (#50).

Standby Processor Interface Circuit Pack Test (#423)

This test is run only in a High or Critical Reliability system. This test is run on Processor Interface circuit packs that are currently in Standby Mode and thus no active calls are up on these circuit packs. It is very important to periodically test the Standby Processor Interface circuit packs to ensure their health in case of an SPE-interchange. This test is run either by system technician demand (**test interface PCS** or **reset interface PCS**) or during scheduled maintenance. The test resets the circuit pack. The main purpose of this test is to perform a Checksum Test on the downloadable firmware or to download new Processor Interface firmware if the **reset interface PCS** command is used. If the checksum fails, then the firmware is downloaded again from the tape.

Table 11-257. TEST #423 Standby Processor Interface Board Test

Error Code	Test Result	Description/ Recommendation
9,10	ABORT	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-257. TEST #423 Standby Processor Interface Board Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1124	ABORT	There are currently no enabled Processor Interface links in the system. 1. Wait and run this test when links are enabled and the PI-SCI (System Communication Interface) has been started up. 2. If this error persists, follow normal escalation procedures.
1	FAIL	Could not reset the Processor Interface circuit pack. 1. Wait one minute, and retry the command. 2. If this test continues to fail, replace TN765 Processor Interface (PI) circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack. 3. If problem continues to persist, escalate the problem.
16 80 94 102	FAIL	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If problem still exists, redownload firmware via **reset interface** command. 3. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-257. TEST #423 Standby Processor Interface Board Test — *Continued*

Error Code	Test Result	Description/ Recommendation
23 199	FAIL	Download of Processor Interface firmware failed. 1. Wait one minute and retry. A tape access problem could be present. Check that tape is in tape drive. 2. If the problem persists and Standby TAPE is idle when command is entered, then a problem could exist in either the Standby TAPE or the Processor Interface circuit pack. Replace the tape with a new tape that contains Processor Interface firmware. Retry the command. 3. If the problem still exists, then refer to the TAPE Maintenance documentation for possible TAPE errors. If there are no TAPE errors, repeat the test command up to five times. If problem still exists, replace the TN765 circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack. 4. If problem still exists with new TN765 Processor Interface circuit pack, replace TAPE drive.
9000s	FAIL	Processor Interface Download failed. 1. Refer to TABLE A, Tape Unit Data Table, and follow the repair recommendations.
	PASS	TN765 Processor Interface circuit pack initialized correctly. Processor Interface links (X.25 and ISDN) should recover now. See PI-LINK Maintenance documentation for more information if links do not recover.

PI-LINK (Processor Interface Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PI-LINK	MINOR	test link lnk-no l	Processor Interface Link
PI-LINK	WARNING	test link lnk-no l	Processor Interface Link

NOTE:
Reference lnk-no via the **display communication-interface links** command.

The Processor Interface (PI) Communication Link is the physical link that connects DEFINITY G1, G3iV1.1-286, or G3iV2-386 to an adjunct such as AUDIX, another Node in a DCS network, or an ISDN-PRI connection. These links are either X.25 (DCS, AUDIX, or MIS) or ISDN (ISDN-PRI). The system supports up to four of these links per TN765 Processor Interface circuit pack. PI-LINK maintenance actually monitors several hardware devices: Processor Interface ports, TN754 or TN784 Digital Line ports, PDMs, TDMs, MTDMs, MPDMs, and DS1 facilities. Henceforth, "data module" refers to either PDM, TDM, MPDM, or MTDM. **In much of the following link documentation, the repair procedures described mention various hardware configurations. Choose the procedure appropriate to your configuration.**

The Processor Interface circuit pack provides an EIA connection. This connection can be administered only on Link 1 in a system without High or Critical Reliability. The EIA port is used when an adjunct (AUDIX, for example) is near (less than 25 feet) or further if a modem is used. The EIA port can also be used to connect two PBXs together via DCS. The EIA port cannot be used in a High or Critical Reliability system.

The Processor Interface Link can be in three different states. These states can be seen via the **status link lnk-no** system technician command. If the link is in a *maintenance busy* state, then the system technician had instructed the Processor Interface to be in maintenance busy by entering the **busyout link lnk-no** command or the Processor Interface Link is not established and maintenance is trying to bring it up. This probably means that an error condition is occurring somewhere on the link that keeps the link from being logically connected and carrying data. If the link is busied out, then it can be put back into service by issuing a **release link lnk-no** command. This restarts the link. If the link is for DCS, then it may speed the recovery of the link if **busyout link lnk-no** and **release link lnk-no** are executed on the switch that is establishing the connection (see the Communication-Interface Links form). The link can be in a *disconnected* state if the link cannot be started up. In this case, maintenance tries to establish the link periodically. If the link is up and data is being sent successfully, then the link is in the *in-service* state.

NOTE:
When an ISDN-PRI link is busied out via a system technician command, the associated B-channels (ISDN-TRK) are moved to the maintenance and/or far-end state. As a result, stable calls are NOT dropped, but the trunks are removed from the trunk hunt group to prevent them from being selected for outgoing calls. See ISDN-TRK Maintenance documentation.

Up to two Processor Interface circuit packs can be active on the same carrier in the system. Thus, there can be a maximum of eight Processor Interface links in service at any one time. If an error or alarm is detected by PI-LINK that can be associated with a physical port on the Processor Interface circuit pack, then the Processor Interface Port MO is alarmed, which indicates a defective port on the circuit pack. Refer to the PI-PT (Processor Interface Port) Maintenance documentation for details.

It is useful to use the **status processor-channel channel-no** command when troubleshooting the PI-LINK. A processor channel corresponds to a processor application (also called a session) and more than one may be using the same physical link (only for X.25 links). The relevant field of the status screen is the "channel status:" which can be in 1 of 7 different states (see the following table). State 6 is normal state for the processor channel for X.25 links and state 10 is normal state for ISDN links. States 9 and 10 are only applicable to ISDN links.

States	Description
1	Incorrect translations or channel not assigned.
3	Attempting to reset the channel but no response from the other end. Getting stuck in this state may be caused by hardware problems, a DS1 synchronization problem or a DCE/DTE conflict in the Communication-Interface Link Form (one end of the link must be DCE and the other must be DTE).
4	The other end acknowledged the channel reset (which means that the two ends are physically connected) but a processor channel connection has not occurred yet. Getting stuck in this state may indicate that translations are incorrect, such as remote processor channel mismatch. To recover from this situation, execute the **busyout link lnk-no** and **release link lnk-no** commands. If this is unsuccessful, then use the **reset interface** command (note that this is a **destructive** command that tears down all four links). This problem may also be caused by a noisy link or DS1 synchronization problems.
6	This is the normal state of the channel. The link is in the data transfer state which means that the application is able to send data over the link.

Continued on next page

States	Description
7	One or more unexpected messages have arrived; software is attempting to resynchronize the two ends. Usually it takes up to five minutes for the software to recover once it is in this state.
9	ISDN-PRI link is currently down. It is periodically restarted or can be forced to restart via **busyout/release link lnk-no**.
10	ISDN-PRI link is up. This is the normal state of the channel. The link is in data transfer state, which means that ISDN data can be sent over the link.

Figure 11-85 shows the Processor Interface Communications Link (PI-LINK) Interactions.

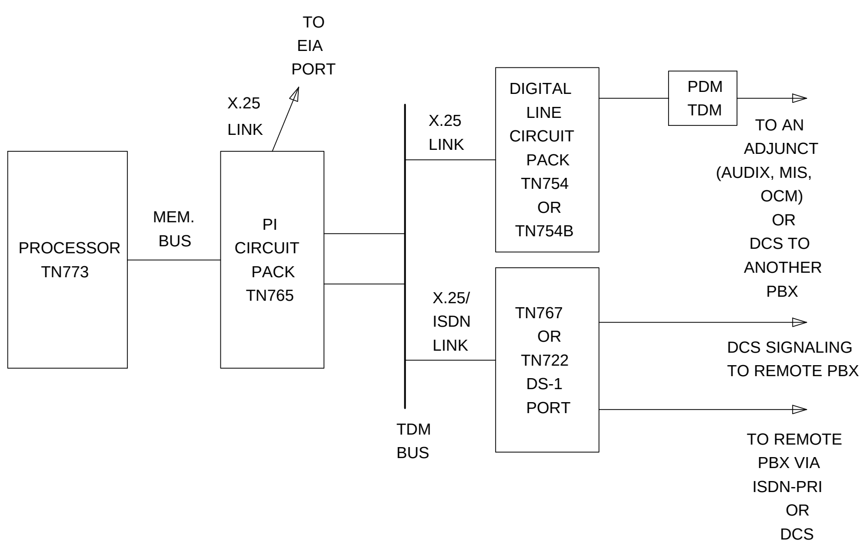

Figure 11-85. Processor Interface Link Interactions

Hardware Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test link <lnk-no> sh
1 (a)	Any	none	MAJOR/ WARNING[2]	OFF	busyout/release link lnk-no
18	0	busyout link lnk-no	WARNING	OFF	release link lnk-no
257 (b)	Any	none	MINOR/ WARNING[2]	OFF	busyout/release link lnk-no
263 (c)	Any	none	MAJOR/ WARNING[2]	OFF	busyout/release link lnk-no
513 (d)	Any	none	MAJOR/ WARNING[2]	OFF	busyout/release link lnk-no
769	Any	PI Loop Around Test (#182)	WARNING	ON	test link lnk-no l r 2
1025	Any	TDM Loop Around Test (#183)	WARNING	OFF	test link lnk-no l r 2
1281 (n)	Any	none	WARNING/ MAJOR[3]	OFF	test link lnk-no sh r 2
1537 (e)	Any	none	WARNING/ MAJOR[3]	OFF	busyout/release link lnk-no
1793 (f)	Any	none	WARNING	OFF	busyout/release link link no.
2049 (g)	Any	none	WARNING/ MAJOR[3]	OFF	test link lnk-no sh r 9
2305 (h)	Any	none	WARNING	OFF	test link lnk-no sh r 9
2561 (i)	Any	none	WARNING	OFF	busyout/release link lnk-no
2817 (j)	Any	none	NONE	OFF	busyout/release link lnk-no
3073 (k)	Any	none	WARNING	OFF	test link lnk-no sh r 9
3585 (l)	Any	none	MAJOR/ WARNING[3]	OFF	busyout/release link lnk-no
3841 (m)	Any	none	MINOR/ WARNING[3]	OFF	busyout/release link lnk-no

Continued on next page

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

3 This error type initially raises a warning alarm. If this error type persists, and alarms are not downgraded on this MO due to the values of **set options**, then, after a period of time, a Major alarm

Notes:

a. A permanent switched call was dropped. Check the "Link Recovery" section.

b. The TN765 Processor Interface circuit pack detected an error on a specific link via background maintenance. If the link is down, busyout and then release the link. If this fails, check all connections. If the error reappears consistently, see "Link Recovery" section.

c. Processor Interface software or firmware detected an error condition on this link. Internal software should initiate the recovery for the link. If the link is still down, see the "Link Recovery" section.

   Aux values of concern; any others can be ignored.

   0 Processor Interface circuit pack indicates that the ISDN-PRI link is down.

   1 An internal software audit indicates that this link has been in overload for at least 20 seconds and is hung.

   2 No internal software buffers are available to process a link transition (that is, down to up, or up to down). The transition is lost.

   17 The allocation of a new software write buffer to the Processor Interface circuit pack failed.

d. Translation Error—check all administration for the link. Possibly the destination DS1-BD or DIG-BD is not inserted. Busyout and then release the link to restart it. This is not a Processor Interface hardware problem. If the problem persists, then follow normal escalation procedures.

Aux values of concern; any others can be ignored.

2	Link translation error. If the communication-processor link form indicates this link's destination is a tac+extension, then bring up the dialplan form. If an extension exists with the same first digit as the tac, then this PI link will not establish. To alleviate this problem, either remove the extension on the dialplan form, or change the destination field on the communication-processor link form to use a UDP extension to dial the far-end.
8	Port not administered in software.

e. This error occurs when the Processor Interface link fails to be established. Check all connections and administration. This could also occur as a result of another error, the failure of Test #182, for example. If the other error on the link can be cleared, then this error may also clear. See the "Link Recovery" section.

Aux values of concern; any others can be ignored.

1, 2	System error. If the error continues to appear, escalate the problem.
7	System error. If this error is occurring on all administered links with the same Aux Data and all links are alarmed, then execute the **reset interface** command to restore all the links. If the error continues or if the error is not on all links, then escalate the problem.
12	One of the two Loop Around Tests failed (#182 or #183). See the "Link Recovery" section.
13	Hardware problem with DS1 facility is affecting ISDN links. Refer to DS1-BD Maintenance documentation.
19	A transient state associated with the D-channel backup protocol. The link is being held in the busy state until call control can be moved to the new active link. No action needs to be taken.

Continued on next page

32771 32772	The remote endpoint indicates that the call is up and the local PBX cannot complete the call. Check trunk status (on the remote end and the local end) if a DS1 trunk is used, or check the status of the data module (PDM,TDM, etc.) if a data module is used in the link. The commands are **status trunk trk-grp/member** or **status data-module <ext>**. If the destination is in-service/active, then the commands are **busyout trunk trk-grp/member** and **release trunk trk-grp/member** (on both sides of the link if this is a DCS link). If a data module is used in the link, then use a **busyout data-module <ext>** command followed by a **release data-module <ext>** command. The Processor Interface Link must be busied prior to busying the trunk or data module. Release the Processor Interface Link via **release link lnk-no** command and the Processor Interface Link re-starts. If this fails, check the status of the TN765 port using **status data <ext>** where **<ext>** is the extension of the port from the interface extension in the Display Communication Link form; if the state is "in-service/idle" then manually call the TN765 port and transfer the call to appropriate destination, either a DS1 Trunk Access Code or the data module extension. See "Link Recovery" if error still occurs and link See "Link Recovery" if error still occurs and link does not establish.
32779 32782 32801	Administration problem; check that the Processor Interface data module extension exists via the **status data-module <ext-no>** command. Verify that the destination extension exists and that the correct routing pattern is used. In addition, check that the Processor Interface data module and the destination extension are correctly administered on the COS and/or COR forms.
32813	Administration problem; check all administration.
32815	The off-premise call timed-out. Check the "Off-Premises Tone Detect Timeout Interval" on the Feature-Related System Parameters Form. The time-out is administered between 6 and 25 seconds. No response was received from the remote destination. Check the status of the remote destination. This might also indicate possible synchronization problems. Network synchronization sources should be checked on all networked switches. Also see the SYNC Maintenance documentation.
32814	Call was answered but not by a remote data module. Check the remote destination extension and verify that this is a data module.
32841	Call went over the trunk and received ring back but did not receive modem answer tone. Check the remote destination for automatic answering.
65528	Administration problem; check all administration.

Continued on next page

65532	Call setup timed out; retry, and check destination. If the destination is an adjunct (CMS, AUDIX, etc.), then check if the terminal ready light is lighted on the PDM. If not, then the adjunct is down. If the destination is another PBX, then the PBX might be restarting. Retry and escalate the problem if this error persists.
65535	Link specified is out-of-range (1 through 8).

f. This error message indicates that the TN765 Processor Interface circuit pack could not transmit the message the software sent to it. See the "Link Recovery" section if the error continues. This is a normal error during "hot start" SPE-interchanges.

g. Excessive resets on the link. Usually indicates that the remote end is down or the physical connection is broken. A warning alarm is raised initially, followed by a Major alarm if the problem is not cleared. See the "Link Recovery" section.

h. Excessive I-frame retransmission. Could indicate a noisy link. Recover as in previous note. Aux values indicate the retransmission rate per minute. See the "Link Recovery" section.

i. If the Aux Data value is 9, then the destination circuit pack (DIG-BD or DS1-BD) is not inserted. Otherwise, DS1 maintenance detected a hardware failure. (DS1 cable disconnected, loss of signal, DS1-BD problems.) Not a Processor Interface Link problem. Check DS1-BD maintenance. Only applicable to ISDN links. Aux value useless. Once the DS1 signal is restored, maintenance automatically restarts the Processor Interface Link. To hasten this process, test the appropriate DS1 Interface circuit pack via **test board PCS** command. When Test #138 (loss of signal) passes, the Processor Interface Link recovers shortly.

   In addition to an indication that the link failed to establish the PI-LINK 2561 AUX_Data, the hardware error log is also updated. This error may indicate two possible conditions:

   1. A failure to detect the DTR from the peripheral.

      When the DTR is not detected by the data module the AUX_Data is set to 40. This indicates that the problem is most likely with the peripheral or the connection to the peripheral.

2. A time-out on the EIA interface query request to the data module.

   When the data module fails to respond to the EIA interface (query request) the AUX_Data is set to 41. This may indicate problems with the data module or connection to the data module. Other errors specific to the data module may also be logged if this is the case.

j. TN765 PI-BD determined that the ISDN link went down. Check connectivity with the other end. Busyout and then release the link to recover. Occurs if DS1 maintenance detected a problem or the remote end is busied out or is down. This also occurs if the ISDN link is unstable or if there is excessive noise on the line. See the "Link Recovery" section.

k. Excessive LAPD (link-access procedure on the D-channel) invalid frame errors. Could be a noisy line or problems with the TN765 Processor Interface circuit pack. Also check DS1-BD Maintenance documentation. See the "Link Recovery" section.

l. Occurs 90 seconds after a 2817 Error Code if link does not recover. At this time, all ISDN trunks associated with this link are put into a maintenance far-end state (see ISDN-TRK for details). See the "Link Recovery" section.

m. The application level process associated with the link has failed to establish a data connection with the far end. This problem prevents data from being processed. The condition may exist even if the link is in a data transfer state. Busyout, and release the link to restart it. This is not a Processor Interface hardware problem. If the problem persists, follow normal escalation procedures.

   Aux values of concern; any others can be ignored.

433	OCM application did not start correctly. Escalation for this problem may also include rebooting the OCM adjunct.
435	Application level process could not connect to session layer process.

n. Excessive (over threshold) HDLC transmit or receive error rates were reported. Aux Data is the HDLC error rate reported. See the Link Recovery section for troubleshooting this problem

Link Recovery

This section describes the general procedure to take to recover from link errors and alarms. Refer to the "Troubleshooting ISDN-PRI Problems" section in Chapter 5, "Routine Maintenance Procedures", before proceeding with this "Link Recovery" strategy.

1. Determine the link status using the **status link** command. If the link status is "in-service" and (for X.25 links) all the pairs of processor channels are complete under "LOCAL/REMOTE PROCESSOR CHANNELS" (that is,

every "/" is followed by a processor channel number, not a blank), then the link is operating correctly and no further action should be taken. If the link status is not "in-service," then go to Step 2. If the link status is "in-service" and (for X.25) some of the processor channel pairs are incomplete (remote channel not specified, meaning that the processor channels are not connected), then look at the status of "status processor-channel" for the local processor channels that are not connected.

2. Look for active PI-SCI alarms and follow the procedure for those alarms if there are any. If there are no PI-SCI problems, go on to the next step.

3. If the link is still down, restart the link via the **busyout link lnk-no** system technician command followed by the **release link lnk-no** command. This sequence tears down the call and then tries to bring it back up. If the link is for DCS, it may speed the recovery of the link if **busyout link lnk-no** and **release link lnk-no** commands are executed on the switch that is establishing the connection (see Communication Link form). If the link does not recover, go on to the next step.

4. Check the status of the remote endpoint.

   a. If the link is busied out, release it.

   b. Is the switch down or restarting?

5. If link was never brought up:

   a. Using *DEFINITY Communications System, Generic 1 and System 75 Administration and Measurement Reports,* 555-200-500 and *DEFINITY Communications System Generic 3 Implementation*, 555-230-653, for instructions as needed, verify that the administration is correct as follows:

   — Enter the **display ds1 PCSS** command. Check the compatibility of the DS1 parameters with the far-end and the CSU.

   — Enter the **display communication-interface links** command.

   — Enter the **display communication-interface processor-channels** command. Enter the **display communication-interface hop-channels** command (if hop-channels are being used).

   — Enter the **display trunk <grp>/<mbr>** command (if DS1 is being used for DCS).

   — Enter the **status sync** command (if DS1 is being used)—make sure the primary synchronization is administered.

6. If link is an EIA link:

   — Verify via the Communication-Interface Links form that the information for the EIA connection is correct on the local and remote PBXs.

7. Try to isolate the problem in the link if hardware is at fault. Test the link via the **test link lnk-no long** system technician command.
   a. If Test #182 fails three times, replace the TN765 circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid". If Test #182 still fails, escalate the problem.
   b. If Test #182 passes and Test #183 fails, replace the TN754 or TN784 Digital Line or the TN722 or TN767 DS1 Interface circuit pack, whichever is used in the link. If Test #183 still fails, replace the TN765 PI-BD. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid". If Test #183 still fails, escalate the problem.
8. If the preceding tests pass:

   Check the physical transmission link:
   a. Are all the circuit packs physically installed?
   b. Are the cables still connected throughout?
   c. Check DS1-BD error section for possible connectivity problems if DS1-BD is used in link connection.
   d. Check CSU options.
9. Finally, restart the Processor Interface circuit pack via **reset interface PCS**. This resets the circuit pack and restarts ALL the links on it.
10. If the preceding procedure was followed and links still do not recover, escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *PI Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence. REMINDER: The command line entry to test the PI-LINK MO is: **test link lnk-no (s or l)**.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Interface Loop Around Test (#182)		X	D
TDM Loop Around Test (#183)		X	D
ISDN Hardware Test (#234)		X	ND
Link Quality Test (#233)	X	X	ND
Data Module Internal Loop Around Test (#175)[2]		X	ND
Digital Line NPE Crosstalk Test (#9)[2]		X	ND
Port Circuit Information Channel and Control Channel Loop Around Test (#13)[2]		X	ND
Data Module Audits Test (#17)[2]	X	X	ND

1 D = Destructive; ND = Nondestructive

2 If the PI-LINK under test is BX.25 and if there is an MPDM or an MTDM as part of the link, then the PI-LINK test sequence is expanded to include the tests on the data module. These tests are run via the PDMODULE or TDMODULE maintenance object. Refer to the PDMODULE TDMODULE (Data Module) Maintenance documentation for descriptions and details of these tests.

Processor Interface Loop Around Test (#182)

This test is destructive.

The Processor Interface Loop Around Test is an on-board Loop Around Test. The test requires that the system technician issue a **busyout link lnk-no** command before this test is run. This means that the DCS, AUDIX, or ISDN link, for example, is torn down. It does not access the TDM Bus at all. When the circuit pack is put into local loop around mode, frames are looped internally on the circuit pack. If the test fails, the Processor Interface circuit pack reports the failure. It is a good check of most of the working hardware on the Processor Interface circuit pack.

Table 11-258. TEST #182 Processor Interface Loop Around Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Link was not busied out via system technician. 1. Busyout the link via the **busyout link lnk-no** command. 2. Retry the test command. If this continues to abort, escalate the problem.
2 4 9	ABORT	1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
16 80 84 85 93 94 102	ABORT	Internal System Error or possible TN765 PI-BD failure. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, then reset the PI-BD via the **test interface PCS long** system technician command. 3. If problem still exists, replace the TN765 PI-BD. 4. If problem reappears, follow normal escalation procedures.

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Table 11-258. TEST #182 Processor Interface Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
12	FAIL	PI-BD reported that Loop Around Test failed. 1. Retry the test. 2. If it continues to fail, try resetting the circuit pack by the **test interface PCS long** command. This TEARS down all other links on this circuit pack (DCS, AUDIX, ISDN, etc.). 3. If the problem still exists, replace the TN765 circuit pack. 4. If problem reappears, follow normal escalation procedures.
	PASS	The on-board Loop Around Test on the TN765 circuit pack passed. Most of the hardware on the circuit pack was tested except for the TDM Bus buffers. If problem is isolated to TN765 and this test passes, then replace TN765 circuit pack since TDM Bus buffers could be at fault.
13	ABORT	The TN765 circuit pack has not been reset yet or is currently being reset. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to abort with error code 13, then check status of all BX.25 and/or ISDN-PRI links on this TN765 via the **status link lnk-no** command. If all links are not in-service, then reset the TN765 using the **test interface PCS long** command. 3. If the TN765 fails to reset, refer to the PI-SCI section of this manual. 4. Else, retry the **test link lnk-no** command. 5. If the test still aborts with error code 13 or from step 2, and some links are in-service and a error code is still present, escalate the problem.

TDM Loop Around Test (#183)

This test is destructive.

This test requires that you enter the **busyout link lnk-no** command before running the test. This means that the DCS, AUDIX, or ISDN link, for example, are torn down. This test checks the health of the TN754 or TN784 DIG-LINE or the TN722 or TN767 DS1 Interface circuit pack. This depends on which circuit pack is used on the link. The TN754 or TN784 Digital Line or DS1 Interface circuit pack is put into loop around mode while the PI-BD is instructed to go into remote loop around. If this test fails, and the previous Test #182 passes, then the TN754 or TN784 Digital Line or the DS1 Interface circuit pack should be replaced. It is not run on ports administered as EIA.

Table 11-259. TEST #183 TDM Loop Around Test

Error Code	Test Result	Description/ Recommendation
1	ABORT	Link was not busied out via system technician. 1. Busyout the link via the **busyout link lnk-no** command. 2. Retry the test command. If the test continues to abort, escalate the problem.
2 4 8	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
6	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
9	ABORT	TN754 or TN784 Digital Line or TN722 or TN767 DS1 Interface circuit pack is not installed. 1. Install circuit pack and retry the test. 2. If test continues to abort with Error Code 9, then escalate the problem.

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Table 11-259. TEST #183 TDM Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
13	ABORT	The TN765 circuit pack has not been reset yet or is currently being reset. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to abort with error code 13, then check status of all BX.25 and/or ISDN-PRI links on this TN765 via the **status link lnk-no** command. If all links are not in-service, then reset the TN765 using the **test interface PCS long** command. 3. If the TN765 fails to reset, refer to the PI-SCI section of this manual. 4. Else, retry the **test link lnk-no** command. 5. If the test still aborts with error code 13 or from step 2, and some links are in-service and a error code is still present, escalate the problem.
16 80 84 85 93 94 102	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, then reset the PI-BD via the **test interface PCS long** command. 3. If problem still exists, replace the TN765 circuit pack. 4. If problem reappears, follow normal escalation procedures.
1005	ABORT	The test is not applicable if the EIA port is being used as part of the link.

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Table 11-259. TEST #183 TDM Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
12	FAIL	PI-BD reported that Loop Around Test failed. 1. Retry the test. 2. If Test #182 fails, see section for Test #182 first. 3. If Test #182 passes and Test #183 continues to fail, replace either the TN754 or TN784 Digital Line or the TN722 or TN767 DS1 Interface circuit pack. 4. If Test #183 still fails, replace the TN765 PI-BD. 5. Escalate on further failures.
	PASS	The loop around from the TN765 PI-BD to the Digital Line or DS1 Interface circuit pack and then back to the PI-BD passed.

Link Quality Test (#233)

This test queries the TN765 circuit pack for the latest error rates (number/minute) for certain counters that are kept by the TN765. The test passes if all the error rates are below a certain threshold. The counters that are queried are the Level 2 Reset SABM(E) [Set Asynchronous Balanced Mode (Extended)] counter, the Level 2 I-frame Retransmission counter, and the invalid LAPD frame counter.

Table 11-260. TEST #233 Link Quality Test

Error Code	Test Result	Description/ Recommendation
3 11 24	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. If the test continues to abort, escalate the problem.
13	ABORT	The TN765 circuit pack has not been reset yet or is currently being reset. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to abort with error code 13, then check status of all BX.25 and/or ISDN-PRI links on this TN765 via the **status link lnk-no** command. If all links are not in-service, then reset the TN765 using the **test interface PCS long** command. 3. If the TN765 fails to reset, refer to the PI-SCI section of this manual. 4. Else, retry the **test link lnk-no** command. 5. If the test still aborts with error code 13 or from step 2, and some links are in-service and a error code is still present, escalate the problem.
4 16385	FAIL	Excessive Level 2 resets (SABM) on link.
16386		Excessive Level 2 I-frame retransmission. Possible noisy link. 1. See PI-LINK (Processor Interface Link) Maintenance documentation for this maintenance object.

Continued on next page

Table 11-260. TEST #233 Link Quality Test — *Continued*

Error Code	Test Result	Description/ Recommendation
16388	FAIL	Excessive LAPD invalid frame errors. Could be a noisy link or problems with the near-end Processor Interface circuit pack or with the far-end. 1. See DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation for DS1 Interface circuit pack problems. 2. See PI-LINK (Processor Interface Link) Maintenance documentation for this maintenance object.

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Table 11-260. TEST #233 Link Quality Test — *Continued*

Error Code	Test Result	Description/ Recommendation
16387	FAIL	Excessive Level 2 resets and excessive Level 2 I-frame retransmission.
16389	FAIL	Excessive Level 2 resets and excessive LAPD invalid frame errors.
16390	FAIL	Excessive Level 2 I-frame retransmissions and excessive LAPD invalid frame errors.
16391	FAIL	Excessive Level 2 I-frame retransmissions, excessive LAPD invalid frame errors, and excessive Level 2 resets. 1. See PI-LINK (Processor Interface Link) Maintenance documentation for this maintenance object.
16392	FAIL	HDLC receive rate exceeded the threshold.
16400	FAIL	HDLC transmit rate exceeded the threshold.
16393-16425	FAIL	Other combinations of above individual failures can be calculated as follows: 16384 = 0X4000 16385 = 0X4001 16386 = 0X4002 16388 = 0X4004 16316 = 0X4010
	PASS	PI-LINK currently does not have any of the above errors.

ISDN Hardware Check Test (#234)

This test checks the status of the ISDN hardware which is the DS1 Interface circuit pack and cabling. Status of the DS1 port is kept by the system. The state of the port can be in-service or out-of-service. This state is updated by DS1 Interface circuit pack maintenance. If DS1 maintenance detects a problem with the physical medium near-end or far-end, the Processor Interface Link maintenance is instructed to restart the link. Therefore, if this test fails, the port is considered out-of-service and the link cannot be brought up until DS1 maintenance changes the state to in-service. This is more of a status inquiry than a test. Thus, the only recovery procedure is to refer to DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation.

Table 11-261. TEST #234 ISDN Hardware Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	This test only runs for ISDN-PRI links. This link is a BX.25 link and, thus, aborts.
	FAIL	Indicates that there is a physical problem with the DS1 facility link. 1. Cross-reference DS1 Interface circuit pack errors for possible reason. Refer to DS1-BD (DS1 Trunk Circuit Pack) Maintenance documentation. 2. Retry the test. It continues to fail until the DS1 problem is cleared up.
	PASS	DS1 facility is functioning correctly.

PI-PT (Processor Interface Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
PI-PT	MAJOR	test interface PCS sh	Processor Interface Port
PI-PT	WARNING	release data-module <ext>	Processor Interface Port

1 Where P is the port network number (1 for PPN only); C is the carrier designation (for example, A or B for processor complex circuit packs); and S is the address of the slot in the carrier where the circuit pack is located (for example, 1 or 2 for either the first or second Processor Interface circuit packs).

PI-PT is the physical port on the TN765 Processor Interface circuit pack. If the Processor Interface Link (PI LINK) MO raises an alarm that can be correlated to an on-board port problem, then PI-PT is alarmed. In a system without High or Critical Reliability, there are no tests that run directly on Processor Interface port. The PI-LINK MO is responsible for the testing of the TN765 ports along with DCS links, AUDIX links, ISDN links, etc. Refer to the PI-LINK (Processor Interface Link) Maintenance documentation for details. In a High or Critical Reliability system, Processor Interface port is used to test the ports on the Standby Processor Interface circuit packs. If the test fails, a Major alarm is raised. More importantly, if a software requested SPE-interchange takes place and an alarm is raised on the Processor Interface port, then the interchange may abort due to alarm severities.

Hardware Error Log Entries and Test to Clear Values

Processor Interface Port PI-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test interface PCS sh r 1
1		Standby PI Port Test (#404)	MAJOR	ON	test interface PCS sh
18	0	busyout data-module <ext>	WARNING	OFF	release data-module <ext>
123 (a)	Any	None	MAJOR	ON	test link lnk-no
130 (b)		None			
257 (a)	Any	None	MAJOR	ON	test link lnk-no l

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. PI-LINK raised this alarm against PI-PT. The Processor Interface Loop Around test failed on one of the ports. Refer to PI-LINK Maintenance documentation for details on resolving this alarm. If this error resulted in an SPE-interchange, then issue the **test interface PCS sh** command on the Standby Processor Interface to try to resolve the alarm.

b. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

PI-PT can be tested by issuing the **test interface PCS** command on the Standby Processor Interface circuit pack. If the Active TN765 Processor Interface circuit pack is tested, then the active test sequence is run (**which is DESTRUCTIVE**). [Refer to PI-SCI (System Communication Interface) Maintenance documentation for details on these tests]. Only the Standby Processor Interface test sequence runs tests directly on PI-PT.

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Standby Processor Interface Port Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Standby Processor Interface

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Audit Test (#50) (a)		X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Standby Processor Interface Circuit Pack Test (#423) (b)	X	X	ND
Standby Processor Interface Port Test (#404)	X	X	ND

1 D = Destructive; ND = Nondestructive

Active Processor Interface

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SCI Start (#176) (c)		X	D
SCI Self Test (#231) (c)	X	X	ND
NPE Audit Test (#50) (a)		X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation for information about these tests.

b. Refer to the PI-BD (Processor Interface Circuit Pack) Maintenance documentation for information about this test.

c. Refer to the PI-SCI (System Communication Interface) Maintenance documentation for information about these tests.

Standby Processor Interface Port Test (#404)

This test is the same as Test #182 in the Processor Interface Link (PI-LINK) Maintenance documentation. However, this test only runs on the Standby Processor Interface circuit pack. It is an on-board loop around test. This test checks the health of physical port on the circuit pack. If the test fails, then a Major alarm is raised on the circuit pack. When the circuit pack is put into local loop around mode, frames are looped internally on the circuit pack. If the test fails, the Processor Interface circuit pack reports the failure. It is a good check of most of the working hardware on the Processor Interface circuit pack.

Table 11-262. TEST #404 Standby Processor Interface Port Test

Error Code	Test Result	Description/ Recommendation
2 9 16 80 84 85 93 94 102	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1124	ABORT	The PI link for this port is currently disabled. This test does not run on disabled PI links. 1. Retry this test if the PI link is re-enabled. Enter the **display communication-interface link** command to verify that this link has been disabled.
1125	ABORT	The Processor Interface Loop Around Test on this port could not be executed since the Processor Interface circuit pack is not in the correct state. 1. Check PI-BD for possible errors and resolve them first. 2. Rerun the **test interface PCS sh** command. 3. If the test continues to abort while the PI-BD Test (#423) passes, escalate the problem.

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Table 11-262. TEST #404 Standby Processor Interface Port Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051	ABORT	Refer to the STBY-SPE Maintenance documentation for a description of these error codes.
12	FAIL	Processor Interface circuit pack reported that Loop Around Test failed. 1. Retry the test. 2. If the test continues to fail, try resetting the circuit pack via the **reset interface PCS** command. 3. If test continues to fail, replace the TN765 circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack.
	PASS	TN765 Processor Interface Circuit Pack Loop Around Test passed. The hardware associated with this port is functioning properly.

PI-SCI (System Communication Interface)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
PI-SCI[2]	MAJOR	test interface PCS (See Warning)	System Communication Interface

1 Where P is the port network number (1 for PPN only); C is the carrier designation (for example, A or B for processor complex circuit packs); and S is the address of the slot in the carrier where the circuit pack is located (for example, 1 or 2 for Processor Interface circuit packs 1 or 2).

2 For additional repair information, see also PI-BD (Processor Interface Circuit Pack) Maintenance documentation.

WARNING:

The "test interface long" command resets the PI-BD and causes all ISDN-PRI and BX.25 links to come down.

The PI-SCI (System Communication Interface) MO is used to put the TN765 Processor Interface circuit pack into a state such that BX.25 (DCS, AUDIX, etc.) and ISDN links can be established. The TN765 Processor Interface circuit pack has downloadable firmware. It is the responsibility of PI-SCI to download the firmware to the TN765 circuit pack during initialization. Failures while communicating with the TN765 circuit pack are logged against the PI-SCI MO. There can be up to two SCIs. There is a one-to-one correlation of PI-SCI to Processor Interface circuit packs. In a High or Critical Reliability system, there can be four Processor Interface circuit packs, but only two on the same carrier are active at any one time. If errors against the SCI can be related to the Processor Interface circuit pack, then the circuit pack MO is alarmed (PI-BD). See also PI-LINK (Processor Interface Link) and PI-BD (Processor Interface Circuit Pack) Maintenance documentation.

When investigating BX.25 (DCS, AUDIX, etc.) and ISDN link problems, resolve PI-SCI errors initially, since they might clear up the Processor Interface link problems.

Hardware Error Log Entries and Test to Clear Values

PI-SCI System Communication Interface Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test interface PCS sh r 1
1 (a)	2055 2056 2057 2058	none	none	none	none
257 (b)	Any	none	MAJOR	ON	test interface PCS l[2]
769 (c)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
1025 (d)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
1281 (e)	Any	Sci Start Test (#176)	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
1793 (f)	Any	none	MAJOR	ON	test interface PCS l[2]
2049 (g)	90xx	Sci Start Test (#176)	MAJOR	ON	test interface PCS l[2]
2305 (f)	Any	Sci Self Test (#231)	MAJOR	ON	test interface PCS sh r 2
2561 (h)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
2817 (i)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
2818 (j)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]
3073 (f)	Any	none	MAJOR/ WARNING[3]	OFF	test interface PCS l[2]

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 See WARNING below.

WARNING:
The "test interface long" command resets the PI-BD and causes all ISDN-PRI and BX.25 links to come down.

3 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. An error occurred during a hot start processor element interchange that caused the associated Processor Interface links (BX.25 and/or ISDN-PRI) to go down temporarily. If these errors reoccur and there are no other errors against PI-BD or PI-SCI escalate the problem; otherwise, resolve the other alarm first.

2055	The checksum of the PI memory was not able to be retrieved.
2056	The PI was not able to be put into a stable state such that the switch to the new active PI failed to keep the existing PI links up.
2057	The active PI was unable to copy the image of its memory to the standby PI.
2058	System software error.

b. This error indicates a possible hardware failure on the TN765 Processor Interface circuit pack. If the error persists, and the SCI is unstable (resets often), type in **test interface PCS long** command. The Processor Interface firmware is redownloaded if the checksum fails. If the problem still exists, automatically redownload the Processor Interface firmware by typing **reset interface PCS**. If this doesn't work, then replace the TN765 Processor Interface circuit pack. Further problems should be escalated. These errors also raise alarms against the PI-BD (Processor Interface Circuit Pack).

NOTE:
To replace an SPE complex circuit pack in a Duplication Option System follow the procedures in Chapter 8, "Reliability Systems: A Maintenance Aid". For a Non-Duplication Option System follow procedures in Chapter 5, "Routine Maintenance Procedures" for instructions on how to replace the Processor circuit pack (TN786 or TN790).

Use the following steps for G3i-386 and later systems where the Processor Interface firmware resides in the flash ROM memory in the Processor circuit pack (i.e. TN786 or TN790) instead of Tape as in G3i-286. If the firmware can't be successfully downloaded into the Processor Interface circuit pack after entering the "reset interface PCS" command, then use the following steps:

1. Replace the TN765 Processor Interface circuit pack:
2. After the new TN765 Processor Interface circuit pack has been inserted successfully, enter "test interface PCS long" command to verify the results of tests.

If the error still indicates the failure for downloading the firmware into Processor Interface circuit pack, then it's possible that the firmware stored in the Processor circuit pack (TN786 or TN790) is corrupted.

3. Follow the Chapter 5, "Routine Maintenance Procedures" Software Upgrade procedure to load the system software from the Memory Card with the correct software release number.

   After the system software is successfully loaded into Processor circuit pack, boot the system up with the customer translation memory card in slot.

   If the failure for downloading the firmware into Processor Interface circuit pack persists after the system reboot, it's possible that the flash ROM chips in Processor circuit pack (TN786 or TN790) may be defective.

4. Replace the Processor circuit pack and repeat the step (3) to load the system software into the Processor circuit pack. Boot the system up again.

   If the failure for downloading the firmware into Processor Interface circuit pack persists after the system reboot, it's possible that the M-BUS at the backplane of control carrier may be defective. Replace the control carrier.

c. Error while communicating with TN765 circuit pack. The software lost handshake with the Processor Interface circuit pack. See Note (b) for recovery.

d. Error while communicating with TN765 circuit pack. See Note (b) for recovery. This error can also be caused by line problems. Investigate possible transmission errors or noise on the associated line.

e. An Aux Data value of 23 indicates that the software failed to open the tape in order to download the Processor Interface firmware. Check if the tape is currently in use (that is, if it is spinning or if the yellow LED is on). When the tape is idle, reissue the **test interface PCS long** command. If the test still fails or if the Aux Data value was other than 23, then refer to Test #176 (Sci Start Test) for details on recovery. For all other Aux Data values, reissue the **test interface PCS long** command, and refer to Test #176 (SCI Start Test) for details on recovery.

   NOTE:
   For G3i-386 and later, see Note (b) for recovery.

f. Error while communicating with TN765 circuit pack. See Note (b) for recovery. These errors also raise alarms against the PI-BD (Processor Interface Circuit Pack).

g. Download of Processor Interface firmware failed. If this error persists, then replace the TN765 Processor Interface circuit pack. This error also raises an alarm against PI-BD if the threshold is reached.

h. An audit of the firmware failed. If BX.25 and ISDN links are still up, no action is needed. If Processor Interface circuit pack is reset continuously, recover as in Note (b).

i. Error while communicating with TN765 Processor Interface circuit pack. See Note (b) for recovery. System software problem internal to the process that monitors Processor Interface link activity. Escalate the problem if error causes the Processor Interface to be reset (loss of service is noticed).

j. This error indicates that the TN765 Processor Interface circuit pack did not clear up the overload condition within one minute of logging the initial 2817 error (overload detected). The circuit pack was reset and all Processor Interface links on that circuit pack were also reset. If this error continues to occur, escalate the problem.

Short and Long Test Sequences

The SCI and Processor Interface circuit pack are both tested via the same system technician command. The system technician command is **test interface PCS l** or **sh** where PCS is an active Processor Interface circuit pack.

WARNING:
The "test interface long" command resets the PI-BD and causes all ISDN-PRI and BX.25 links to come down.

For information about testing the Standby Processor Interface circuit pack, see PI-BD Maintenance documentation. If the Active Processor Interface has no enabled links (see Communication-Interface Links Form in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids"), only XXX-BD (Common Port Circuit Pack) tests execute.

System Technician Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *SCI Start Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SCI Start Test (#176)		X	D
SCI Self Test (#231)	X	X	ND
Control Channel Loop Test (#52) (a)	X	X	ND
NPE Audit Test (#50) (a)		X	ND

1 D = Destructive; ND = Nondestructive

a. For information about these tests, refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation. These tests are run on the PI-BD (Processor Interface Circuit Pack) Maintenance object.

SCI Start Test (#176)

This test is destructive.

This test restarts the System Communication Interface. This implies all BX.25 (DCS, AUDIX, mis, etc.) and ISDN links are restarted. The checksum of the downloadable firmware is tested. If the checksum fails, the firmware is redownloaded from tape. If it passes, SCI Start completes and the associated BX.25 and ISDN Links are started up. If a circuit pack needs to be replaced, refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on replacing an SPE circuit pack.

In G3i-386 and later, the Processor Interface circuit pack firmware is downloaded from the flash ROM memory of Processor circuit pack. If the checksum test fails, then the firmware is re-downloaded again from Processor circuit pack. If it passes, SCI Start completes and the associated BX.25 and ISDN links are started up. If the checksum failure persists, refer the footnote (b) of Hardware Error Table for repair procedure.

Table 11-263. TEST #176 SCI Start Test

Error Code	Test Result	Description/ Recommendation
9 10	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	Could not reset the Processor Interface circuit pack. 1. Wait one minute, and retry the command. 2. If test continues to fail, replace TN765 Processor Interface circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack. 3. If problem continues to persist, escalate the problem.

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Table 11-263. TEST #176 SCI Start Test — *Continued*

Error Code	Test Result	Description/ Recommendation
16 80 94 102	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If problem still exists, redownload firmware via **reset interface** command. 3. For G3i-386 and later, see note (b) of Hardware Error Table for repair procedure
200	FAIL	Checksum of Processor Interface failed. 1. Wait one minute and retry. 2. If the test continues to fail with a checksum failure, there could be corruption on the tape. Replace the tape with a new tape that contains Processor Interface firmware. Retry the command. For G3i-386 and later, see note (b) of Hardware Error Table for repair procedure. 3. In G3i-286 if the problem continues to exist after replacing the tape, then replace the TN765 Processor Interface circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions about replacing an SPE complex circuit pack. Retry the command. If problem persists, escalate the problem.

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Table 11-263. TEST #176 SCI Start Test — *Continued*

Error Code	Test Result	Description/ Recommendation
23 199 9000s	FAIL	Processor Interface Download failed. Refer to TABLE A Tape Unit Aux Data Table and follow the repair recommendations. 1. Wait one minute and retry. Could be tape access problem. Check that a tape exists in the tape drive. For G3i-386 or later, see note (b) of Hardware Error Table for repair procedure 2. If problem persists and TAPE is idle when command is entered, then a problem may exist in either the TAPE or the Processor Interface circuit pack. Replace the tape with a new tape that contains Processor Interface firmware. Retry the command.
	PASS	TN765 Processor Interface circuit pack initialized correctly. Processor Interface links (BX.25 and ISDN) should recover now. See PI-LINK for more information if links do not recover.

SCI SELF TEST Test (#231)

This is an on-board test which checks the basic functionality of the TN765 circuit pack. This test runs in the background periodically, or it can be invoked via the **test interface PCS** command. If this test continuously fails, then replace the TN765 Processor Interface circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack.

Table 11-264. TEST #231 SCI Self Test

Error Code	Test Result	Description/ Recommendation
11	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
13	ABORT	The TN765 PI circuit pack has not been reset yet or is currently being reset. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort with error code 13, then reset the TN765 via "test interface PCS long". **CAUTION:** *Resetting the TN765 will cause all BX.25 (Audix, cms, etc.) and ISDN-PRI links to be briefly torn down.* 3. If TN765 fails to be reset, refer to test 176 section description. 4. If the test still aborts with error code 13, escalate the problem.

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Table 11-264. TEST #231 SCI Self Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4xxx	FAIL	Hardware on the TN765 Processor Interface failed. 1. 4000 - Assigned data link hardware failure. 2. 4001 - Unassigned data link hardware failure. 3. 4002 - CPU function test failed - hardware failure. 4. 4003 - Local Processor Interface RAM memory test failed - hardware failure. 5. 4004 - Local EPROM memory test failed - hardware failure. 6. For all of the above errors, retry the test. If it fails again, the Communication Interface should be restarted. Type in a **reset interface** command. If the reset is successful, retry the **test interface** command. If Test #231 still fails with error codes other than 4001, then replace TN765 Processor Interface circuit pack. Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace an SPE complex circuit pack. If test fails with Error Code 4001, then an on-board failure is associated with a non-used port on Processor Interface circuit pack. TN765 circuit pack should be replaced if this port will be used in the future.
	PASS	TN765 Processor Interface circuit pack passed self-test. On-board hardware is functioning correctly.

PKT-BUS (Packet Bus)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
PKT-BUS	MAJOR	test pkt P l r 2	Packet Bus
PKT-BUS	MINOR	test pkt P l	Packet Bus
PKT-BUS	WARNING	test pkt P l	Packet Bus

1 Where P is an appropriate port network number determined via the PORT field from the Alarm or Error Log.

The Packet Bus consists of a single bus, and one such bus appears in each port network. The Packet Bus in each port network is physically independent. Therefore, there is one instance of the Packet Bus maintenance object for each port network.

In DEFINITY G3iV1.1-286 or G3iV2-386, the Packet Bus is used to carry ISDN-BRI and ASAI signaling information. The SPE interface to the Packet Bus is in the TN778 Packet Control circuit pack (PKT-CTRL). Packet Bus maintenance is performed only when the Packet Bus is enabled on the Maintenance-Related System Parameters form. Packet Bus testing is dependent on the Packet Bus port (M/T-PKT) of the TN771 Maintenance/Test circuit pack (M/T-BD), the TN778 Packet Control Circuit Pack (PKT-CTRL), the TN570 Expansion Interface circuit pack (EXP-INTF), and on the ISDN-BRI circuit packs (BRI-BD). Packet Bus tests may abort if some of this hardware is not present in the system. Also, these tests may yield inconsistent results if some of this hardware is defective.

The interactions between the Packet Bus and the circuit packs that use the bus are complex. For this reason, the Packet Bus can be alarmed due to a circuit pack failure and, conversely, circuit packs can be alarmed due to a Packet Bus failure. Chapter 9, "Packet Bus Fault Isolation and Correction" describes Packet Bus maintenance and also the interactions of the bus with the Packet circuit packs. The chapter discusses fault isolation and correction procedures, and it should be referenced for all procedures and required decisions. The "Packet Bus Fault Isolation Flowchart" section of Chapter 9, "Packet Bus Fault Isolation and Correction" is the normal starting point in the chapter for experienced technicians. However, technicians who are unfamiliar with the Packet Bus and its use in DEFINITY G3iV1.1-286 or G3iV2-386 should refer to the introductory material. This section on PKT-BUS is limited to a description of the Error and Alarm Log entries for the Packet Bus maintenance object and to a description of the Packet Bus test sequence.

A failure of one or more circuit packs that use the Packet Bus can cause a Packet Bus alarm. In addition, a Packet Bus failure can cause loss of service to one or more such circuit packs, as well as to the ports and endpoints associated with the ISDN-BRI circuit pack (BRI-PORT, ABRI-PORT, BRI-SET, BRI-DAT, and ASAI-ADJ). These interactions are discussed in the "Circuit Packs That Use the Packet Bus" section of Chapter 9, "Packet Bus Fault Isolation and Correction".

The following list summarizes some of the important points to consider when working with the Packet Bus. For a complete description of these points, refer to the introductory sections of Chapter 9, "Packet Bus Fault Isolation and Correction".

- The Maintenance/Test circuit pack (TN771) is a critical tool for isolating Packet Bus faults. This circuit pack is present in each port network of a High or Critical Reliability system that is using the Packet Bus. In a Standard system, the circuit pack may be included as a Customer option. If a TN771 is not present, **one must be taken to the customer site** to allow for proper fault isolation. (A determination as to whether a TN771 circuit pack is in the system is made by entering the **list configuration** command.) Use of the Maintenance/Test Packet Bus port facilities is described under "The Maintenance/Test Circuit Pack (TN771)" in Chapter 9, "Packet Bus Fault Isolation and Correction". Also, in the same chapter, the section entitled "Special Precaution Concerning the TN771" describes other circumstances when a TN771 must be taken to the customer site.
- Certain catastrophic Packet Bus failures have an effect on Packet circuit pack, port, and endpoint maintenance. The following list summarizes the impact of such failures in this regard. For further details, refer to the "Maintenance of the Packet Bus" section of Chapter 9, "Packet Bus Fault Isolation and Correction":
  - ISDN-BRI circuit pack (BRI-BD) in-line errors indicating possible Packet Bus failures are placed into the error log, but are not acted upon.
  - ISDN-BRI port (BRI-PORT, ABRI-PORT) in-line errors indicating possible Packet Bus failures **are neither placed into the error log nor acted upon**.
  - ISDN-BRI endpoint (BRI-SET, BRI-DAT, ASAI-ADJ) in-line errors **are neither placed into the error log nor acted upon**.
  - Circuit pack and port in-line errors that are not relevant to the Packet Bus or that indicated a circuit pack failure are acted upon in the normal fashion.
  - Normal background maintenance (periodic and scheduled) is not affected.
  - Foreground maintenance (for example, commands executed on the Manager I terminal) are not affected.

  The actions in the previous list serve to reduce the system load, which could become excessive if too many maintenance objects are affected by a Packet Bus failure. However, such an excessive load should in no way impede the isolation and the correction of the faults.

When the actions in the list are implemented, Error Type 3329 is logged against PKT-BUS, and a Warning alarm is raised (although other Packet Bus errors in many cases raise more severe alarms, thereby overriding the Warning alarm).

- A Packet Bus failure in the Processor Port Network (PPN) causes Packet traffic (ISDN-BRI, ASAI) in the Expansion Port Networks (EPNs) to fail, even though there is no Packet Bus failure in the EPN. This is true because all Packet traffic requires communication with the Packet Control (PKT-CTRL) circuit pack in the PPN. Due to this requirement, a PPN Packet Bus failure must be investigated first whenever Packet Bus failures occur in multiple port networks.

Hardware Error Log Entries and Test to Clear Values

PKT-BUS Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test pkt
1 (a)	1-2	Packet Circuit Pack Audit Test (#570)	MAJOR	ON	test pkt P l r 2
257 (b)	Any	Packet Control Bus Loop Around Test (#571)	MAJOR	ON	test pkt P l r 2
513 (c)	1-24	Maintenance/Test Circuit Pack Query Test (#572)	MAJOR	ON	test pkt P l r 2
1793 (d)	Any	none			
2049 (e)	1-3	Maintenance/Test Circuit Pack Query Test (#572)	MINOR	ON	test pkt P l r 2
2305 (f)	1-24	Maintenance/Test Circuit Pack Query Test (#572)			test pkt P l
3329 (g)	1-7 or 1000-1007	none	WARNING	ON	test pkt P l
3585 (h)	Any	none	MINOR	ON	test pkt P l
3841 (i)	Any	none	MINOR	OFF	

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

NOTE:
For PKT-BUS, an ON-BOARD alarm indicates a problem with the Packet Bus itself.

Notes:

a. Within the last minute, packet circuit packs have reported errors that indicate a possible Packet Bus failure. The Aux Data value is 1 or 2, indicating that only one or more than one Packet circuit pack (respectively) have reported a possible Packet Bus failure.

b. Packet Bus maintenance has been unable to perform loop around tests from the TN778 Packet Control circuit pack (PKT-CTRL) to itself. This could indicate faults on the Packet Control circuit pack rather than on the Packet Bus. Examine the Error and Alarm Logs for any such errors.

c. The Maintenance/Test Packet Bus port (M/T-PKT) for this port network has determined that there are more Packet Bus faults than the port can correct. The Aux Data value indicates the number of faulty leads.

d. Packet circuit packs have detected possible Packet Bus failures via in-line error or background test failure. Examine the Error and Alarm logs for more specific PKT-BUS errors.

e. The Maintenance/Test Packet Bus port (M/T-PKT) has caused Packet Bus leads to be swapped to spare leads. This error appears only in a High or Critical Reliability system. The Aux Data value indicates the number of faulty leads. If this is the only active error against the Packet Bus, **the Packet Bus is still in service**. Therefore, due to the disruptive nature of the Packet Bus Fault Isolation and Correction procedures, repairs should be deferred until a time when these procedures cause the least interruption in service. This matter is resolved via consultation with the customer. However, be sure not to delay repairs for too long, since the switch is not able to recover from another Packet Bus failure until the existing one is resolved. The procedure described in the section entitled "Special Precaution Concerning the TN771" in Chapter 9, "Packet Bus Fault Isolation and Correction" is used to ensure that the Maintenance/Test is giving correct information. This procedure may require that a new TN771 be taken to the customer site.

f. The Maintenance/Test Packet Bus port (M/T-PKT) has detected open leads on the Packet Bus. The Aux Data value indicates the number of open leads.

g. Packet circuit pack, port, and endpoint maintenance has been disabled due to a Packet Bus failure. The Aux Data value indicates which sources have reported errors that have caused maintenance to be disabled. These sources include the following:

- In-line errors from Packet circuit packs.
- Packet Bus Uncorrectable report from the Maintenance/Test Packet Bus port (M/T-PKT).
- Packet Bus Interface Failure report from the Packet Control

  (PKT-CTRL).
- In an EPN, packet circuit pack, port, and endpoint maintenance will be disabled if a Packet Bus failure occurs in the PPN.

The Aux Data values that indicate these sources are identified in the following table:

Aux Data	Packet Circuit Pack	Maint/Test Circuit Pack	Packet Control
1/1001	X		
2/1002		X	
3/1003	X	X	
4/1004			X
5/1005	X		X
6/1006		X	X
7/1007	X	X	X

If the Aux Data value is in the range 1000-1007, then Packet circuit pack, port, and endpoint maintenance has been disabled in the EPN due to a PPN Packet Bus failure. If the value is greater than 1000, then there is also a failure of the packet Bus in this EPN and the source of the other information can be determined from the table above.

NOTE:
It is important to remember that problems reported by Packet circuit packs may be caused by **any** circuit pack. However, only Packet circuit packs can detect such problems (inasmuch as TDM-only circuit packs are not affected by these problems).

h. Include Packet circuit pack, port, and endpoint maintenance has been disabled due to more than one circuit pack reporting in-line errors. If this occurs more than three times in 15 minutes (that is, if maintenance is disabled due to errors and then re-enabled because no more errors are reported), a Minor alarm is raised against the Packet Bus. Note that this error may still be present in the error log even if the "Circuit Pack Audit Test" reports that only one circuit pack has indicated a problem. This occurs if more than one circuit pack reported errors with in any one minute interval since the Packet Bus fault occurred.

NOTE:
Because alarms against a Maintenance Object are not resolved until all alarming has been cleared, an alarm due to a missing Maintenance/Test Packet Bus must be cleared by installing a Maintenance/Test circuit pack before it can be determined if other Packet Bus alarms have been resolved.

i. The Maintenance/Test Packet Bus port (M/T-PKT) for this port network is not in service. This error appears only in a High or Critical Reliability system, and it can occur in the following cases:

- The Packet Bus port has been busied out (indicated by an Error Type 18), and a Warning alarm is active against M/T-PKT in the same port network. Release the port by entering the **release port PCSS04** command.
- The Packet Bus port has failed. Look for alarms against M/T-PKT, and attempt to resolve these alarms.
- The Maintenance/Test circuit pack was not recognized by the system at the last system restart. Replace the Maintenance/Test circuit pack. There is no Maintenance/Test circuit pack installed in this port network. One must be installed.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when you are inspecting errors in the system. By clearing error codes associated with the *Packet Circuit Pack Audit Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Circuit Pack Audit Test (#573)	X	X	ND
Maintenance/Test Circuit Pack Query Test (#572)	X	X	ND
Packet Control Bus Loop Around Test (#571)	X	X	ND

1 D = Destructive; ND = Nondestructive

Packet Control Bus Loop Around Test (#571)

This test uses circuitry on the Packet Control circuit pack (TN778) to look for faults on the Packet Bus. If the Packet Control circuit pack has detected parity errors on the Packet Bus, or if it is unable to loop back data to itself, the test fails. The test passes if no parity errors are detected and if data is successfully looped back.

This test provides information only for the PPN of a standard system. If the test is run in an EPN or in the PPN of a High or Critical Reliability system, the test aborts.

Table 11-265. Test #571 Packet Control Bus Loop Around Test

Error Code	Test Result	Description/ Recommendation
1022	ABORT	No Packet Control circuit pack exists in this port network. 1. This test gives information only for the PPN. Ignore results from this test whenever it is run in other port networks.
1024	ABORT	The Packet Control circuit pack is in use by Packet Control maintenance at this time. The test cannot be completed until the Packet Control circuit pack becomes available. 1. Wait for Packet Control maintenance to finish using the Packet Control circuit pack. (The green LED goes out.) 2. Re-enter the command.
1141	ABORT	The Packet Control circuit pack is out-of-service. 1. Determine if the Packet Control circuit pack is busied out (this is indicated by an Error Type 18 logged against PKT-CTRL). If the pack is busied out, release the pack by entering the **release packet-control** command. Then re-enter the command. 2. If the Packet Control circuit pack is NOT busied out, refer to PKT-CTRL Maintenance documentation for recommended repair procedures.

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Table 11-265. Test #571 Packet Control Bus Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1143	ABORT	This test is run only in High or Critical Reliability systems. 1. Ignore results from this test whenever it is run in a High or Critical Reliability system. 2. If this system does not have High or Critical Reliability, escalate the problem.
2000	ABORT	The test timed-out while waiting for the packet to be returned from the loop around. 1. Re-enter the command at one minute intervals a maximum of five times. 2. If the test continues to abort, check for problems with the Packet Control (look for PKT-CTRL errors in the Error and Alarm Logs). 3. If there is no problem with the Packet Control circuit pack, escalate the problem.
2076	ABORT	The parity error check circuitry on the Packet Control circuit pack is not functioning correctly. 1. Run the test again. 2. If the same abort occurs again, refer to PKT-CTRL Maintenance documentation to attempt to correct the fault.
2060	ABORT	The link on the Packet Bus that is being used to perform the test has failed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, check for problems with the Packet Control (look for PKT-CTRL error in the Error and Alarm Logs). 3. If there is no problem with the Packet Control circuit pack, escalate the problem.

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Table 11-265. Test #571 Packet Control Bus Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Maintenance could not allocate all of the necessary system resources to perform this test.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The Packet Control Bus Loop Around Test failed (parity errors were detected from the test packet).
2	FAIL	The Packet Control Bus Loop Around Test failed (the Packet Control circuit pack could not bring up a loop around link on the Packet Bus). 1. Refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 9, "Packet Bus Fault Isolation and Correction" to determine the cause of the test failures.
	PASS	No faults have been detected on the Packet Bus by the Packet Control circuit pack. This indicates that the Packet Bus is operating correctly.

Maintenance/Test Circuit Pack Query Test (#572)

This test queries the Maintenance/Test Packet Bus port about the state of health of the Packet Bus. If the Maintenance/Test circuit pack indicates that the Packet Bus has faults, the test fails. The corresponding failure code describes the severity, type, and number of faults. The test passes if the Packet Bus is fault-free.

NOTE:
A Maintenance/Test circuit pack is usually not present in a Standard system unless the customer has purchased this circuit pack to use for ISDN-PRI test calls, or to enhance the system's ability to quickly recognize a Packet Bus failure.

Table 11-266. TEST #572 Maintenance/Test Circuit Pack Query Test

Error Code	Test Result	Description/ Recommendation
1006	ABORT	The Packet Bus port of the Maintenance/Test circuit pack is out of service. 1. Determine if the port is busied out. If so, release the port by entering the **release port PCSS04** command. Re-enter the test command. 2. If there are alarms active against the Packet Bus port (M/T-PKT), refer to M/T-PKT Maintenance documentation to resolve them. Then re-enter the test command.
1142	ABORT	No Maintenance/Test circuit pack Packet Bus port is in service in this port network. 1. If this system has High or Critical Reliability, either (a) the Maintenance/Test circuit pack for this port network has failed, and should be replaced, (b) the Maintenance/Test circuit pack has been busied out, and should be released, or (c) there is no Maintenance/Test circuit pack in this port network, and one must be installed. 2. In a system without High or Critical Reliability, the Maintenance/Test Packet Bus Port may not be present. If the port is present, and if it is busied out or has failed, release or replace the circuit pack. If there is no Maintenance/Test circuit pack, ignore the results of this test for this port network.

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Table 11-266. TEST #572 Maintenance/Test Circuit Pack Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	The test timed-out while waiting for an uplink CCMS response from the Maintenance/Test Packet Bus port. 1. Re-enter the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, check for problems with the Maintenance/Test Packet Bus port (look for M/T-PKT in the Error and Alarm Logs). 3. If there is no problem with the Maintenance/Test Packet Bus port, escalate the problem.
2059	ABORT	The Maintenance/Test Packet Bus port has reported a hardware failure. 1. Refer to M/T-PKT Maintenance documentation to correct the problem. 2. Re-enter the test command. 3. If the test continues to abort with this code, escalate the problem.
2077	ABORT	The Maintenance/Test Circuit Pack Query located more than one Maintenance/Test Packet Bus port in the port network. **NOTE:** The software should not allow this to occur. This is an internal system error. Escalate the problem, but also attempt the following work-around steps. 1. Remove all Maintenance/Test circuit packs from the port network. 2. Insert one Maintenance/Test circuit pack (there should not be more than one in a port network). 3. Re-enter the test command.

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Table 11-266. TEST #572 Maintenance/Test Circuit Pack Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Maintenance could not allocate all of the necessary system resources to perform this test.
2500	ABORT	An internal operation failed; the test could not be completed. 1. Re-enter the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
XYZZ	FAIL	The Maintenance/Test Packet Bus port has detected faults on the Packet Bus. The error code is encoded as follows:
1xxx		The Maintenance/Test Packet Bus port has reconfigured the Packet Bus around the faulty leads. This should occur only in High or Critical Reliability systems.
2xxx		The Maintenance/Test Packet Bus port is unable to correct all of the Packet Bus faults it has detected.
x0xx		None of the Packet Bus faults are open faults.
x1xx		At least some of the Packet Bus faults are open faults. Look for Error Type 2305 in the Error Log. The Aux Data value indicates the number of open leads.
xxZZ		The last two digits of the error code indicate the total number of faulty Packet Bus leads the Maintenance/Test Packet Bus port has detected. 1. Refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 9, "Packet Bus Fault Isolation and Correction" to determine the cause of the failures.
	PASS	No faults have been detected on the Packet Bus by the Maintenance/Test circuit pack. This indicates that the Packet Bus is operating correctly.

Packet Circuit Pack Audit Test (#573)

This test determines whether Packet circuit packs have reported Packet Bus-related in-line errors within the last minute. If so, the failure code indicates whether one or more circuit packs have reported failures within the last minute.

Due to the one minute time constraint included as part of this test, the test is designed to delay 15 seconds before returning a result in cases where the test has failed within the last five minutes. This procedure helps ensure that a repeated sequence of the test does not always yield the same result. If no failure has occurred in the last five minutes, a PASS is returned immediately.

Table 11-267. Test #573 Packet Circuit Pack Audit Test

Error Code	Test Result	Description/ Recommendation
2500	ABORT	An internal operation failed; the test could not be completed. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	One Packet circuit pack has reported Packet Bus-related in-line errors within the last minute.
2	FAIL	More than one Packet circuit pack has reported Packet Bus-related in-line errors within that last minute. 1. Refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 9, "Packet Bus Fault Isolation and Correction" to determine the cause of the error reports.
	PASS	No Packet circuit packs have reported Packet Bus-related in-line errors within the last minute. This indicates that the Packet Bus is healthy, or that a Packet Bus fault is transient or is being caused by a faulty Packet circuit pack. If this test passes while there are other signs of a Packet Bus failure (as indicated, for example, in the Error/Alarm Logs or by other test failures), refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 9, "Packet Bus Fault Isolation and Correction" to isolate the problem.

PKT-CTRL (Packet Control Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PKT-CTRL	MAJOR	reset packet-control C l[1]	Packet Control Circuit Pack
PKT-CTRL	MINOR	test packet-control C l[2]	Packet Control Circuit Pack
PKT-CTRL	WARNING	release packet-control C	Packet Control Circuit Pack

1 If the specified Packet Control circuit pack is in the active SPE, it must first be busied-out via the **busyout packet-control C** command. After testing has completed, the Packet Control circuit pack should be released from the busyout state via the **release packet-control C** command.

2 Where C is the carrier designation (A or B) and should be specified only in a High or Critical Reliability system.

CAUTION:

A detailed flowchart for isolating and resolving Packet Bus faults is included in Chapter 9, "Packet Bus Fault Isolation and Correction". This flowchart, along with the other information presented in the chapter, can help in resolving problems that are not isolated to the Packet Control. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to reference Chapter 9, "Packet Bus Fault Isolation and Correction" in addition to the MO documentation for Packet Bus.

The TN778 Packet Control circuit pack is the hardware component that serves as the interface between the SPE and the Packet Bus. It terminates the Link Access Procedure D (LAPD) protocol and provides support for thousands of signaling links. As shown in Figure 11-86, a Packet Control link generally terminates on the Packet Control circuit pack and a packet endpoint which is connected to a Packet circuit pack. An ASAI adjunct is an example of a packet endpoint, and a TN556 is an example of a Packet circuit pack. In G3iV1.1-286 or G3iV2-386, the following Packet circuit packs (packs that can connect to the Packet Bus) are available:

- TN556 ISDN-BRI Line Circuit Pack
- TN570 Expansion Interface Circuit Pack

- TN771 Maintenance/Test Circuit Pack
- TN778 Packet Control Circuit Pack

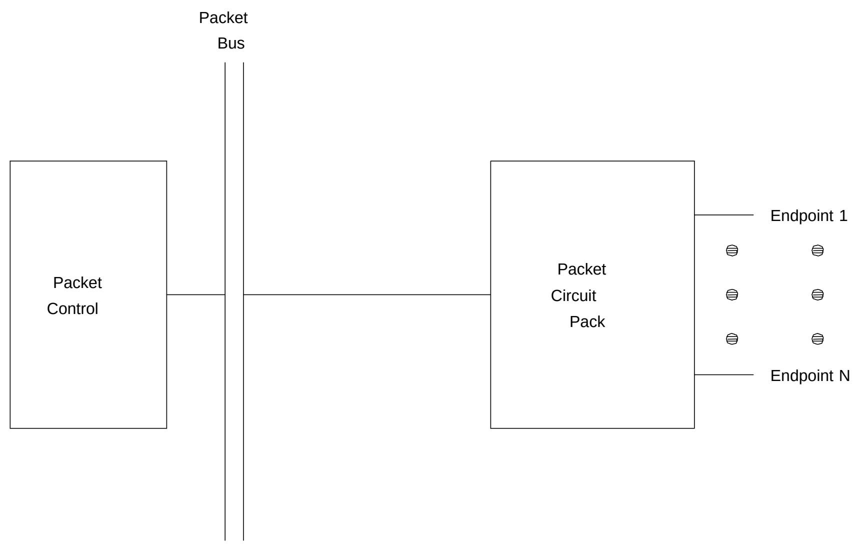

Figure 11-86. Hardware Configuration

The Packet Control circuit pack is not administered in the normal manner; there is no **add** or **remove** command associated with it. However the "Packet Bus Activated?" field on the Maintenance-Related System Parameters Form indicates if the Packet Control circuit pack is "administered." If the "Packet Bus Activated?" field is set to "yes," a Packet Control circuit pack should be installed in the system, since the Packet Control circuit pack is required in systems which use the Packet Bus. If a Packet Control circuit pack is not installed, and the "Packet Bus Activated?" field is set to "yes," a major on-board alarm is raised against the PKT-CTRL MO. This alarm indicates that the Packet Control circuit pack is "missing." Refer to the "Maintenance-Related System Parameters Form" section in Chapter 5, "Routine Maintenance Procedures" for more information on the "Packet Bus Activated?" field.

Note that the Packet Control circuit pack is listed by the **list configuration all** or **list configuration control** commands only if the Packet Control circuit pack is physically inserted into its slot and the Packet Bus is activated by setting the "Packet Bus Activated?" field to "yes" on the Maintenance-Related System Parameters Form. If the Packet Control circuit pack is physically inserted into its slot but the Packet Bus is not activated, then the Packet Control circuit pack will not appear in the output of the **list configuration all** or **list configuration control** commands.

The **status packet-control C** command provides useful information about the Packet Control circuit pack. This command displays the service state of the circuit pack and various link-related information. The service state "out" indicates that service is not being provided and users are being disrupted. Maintenance takes the Packet Control circuit pack out-of-service due to certain faults, or as a result of the **busyout packet-control C** command being run. Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for more information on the **status packet-control** command.

Hardware Error Log Entries and Test to Clear Values

Packet Control Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)	Any	None	MAJOR	ON	reset packet-control C (k)
18	0	busyout packet-control C	WARNING	OFF	release packet-control C
257 (b)	Any	None	MAJOR	ON	reset packet-control C (k)
513 (c)	0	None			
769 (d)	Any	Loop Around Test (#585)			
1025 (e)	1	Parity Circuitry Test (#584)	MINOR	ON	test packet-control C l
1281 (f)	0	None			
1537 (g)	0	None			
1793 (h)	0	None			
2049 (i)	0	None			
2305 (j)	Any	Download Test (#581)	MAJOR	OFF	reset packet-control C

Notes:

a. This error occurs when maintenance software resets the Packet Control circuit pack due to an in-line error or certain test failures. Once a threshold number of these errors occur, maintenance places the Packet Control circuit pack into an out-of-service state, and a major on-board alarm is raised on the Packet Control circuit pack.

b. This error occurs due to certain in-line errors and test failures. This error is very serious, and when it occurs maintenance software immediately escalates testing to the destructive reset test (#586).

c. This error indicates that a loss of communication was detected between the SPE software and the Packet Control circuit pack. No alarm is raised. However, if this error occurs repeatedly, software testing escalates to the Reset Test (#586) so that the health of the Packet Control circuit pack can be determined.

d. This error occurs when the Packet Control Loop Around Test (#585) fails because a link cannot be established or because the Packet Control circuit pack cannot send and receive data correctly. No alarm is raised.

However, if this error occurs repeatedly, software testing escalates to the Reset Test (#586) so that the health of the Packet Control circuit pack can be determined.

e. This error occurs when the Packet Control Parity Circuitry Test (#584) fails, thus indicating a possible fault with the parity circuitry in detecting Packet Bus parity errors. If this error occurs a number of times exceeding a defined threshold, a minor on-board alarm is raised.

f. This error occurs when a certain circuit pack-level diagnostic test fails, thus indicating a transient fault (which has been recovered) existed on the Packet Control/Packet Bus interface. No alarm is raised because the error does not isolate the fault to the Packet Control circuit pack. However, if the error occurs repeatedly, software testing escalates to the Reset Test (#586) so that the health of the Packet Control circuit pack can be determined.

g. This error occurs when a certain circuit pack-level diagnostic test fails, indicating there is a fault on the Packet Control/Packet Bus interface. No alarm is raised because the Packet Bus may be the source of problem. When this error occurs, Packet Bus maintenance is notified, thereby causing appropriate tests to run.

h. This error occurs when a parity error is detected by the Packet Control circuit pack, indicating some data sent over the Packet Bus is corrupted. No alarm is raised against the Packet Control circuit pack because the problem may be associated with the Packet Bus. When this error occurs, Packet Bus maintenance is notified, thereby causing appropriate tests to run.

i. This error occurs when the Packet Control circuit pack receives a threshold number of frames with invalid address. No alarm is raised because there is no direct indication of a Packet Control fault. The frames may be corrupted by the sending side or by the Packet Bus. No maintenance activity is triggered by this error. No action is required.

j. This error occurs when the Packet Control Download Test (#581) fails. Once a threshold number of these errors occur, a major off-board alarm is raised. Maintenance software retries the download test repeatedly until it passes. Since the **reset packet-control C** command causes the firmware to be downloaded and provides additional diagnostics on this error type, this command should be used when a download failure has occurred.

k. If the specified Packet Control circuit pack is in the active SPE, it must first be busied-out via the **busyout packet-control C** command. After testing has been completed, the Packet Control circuit pack should be released from the busyout state via the **release packet-control C** command.

System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system and deciding which ones to address, always investigate errors in the order they are presented in the tables below. By clearing error codes associated with the *Packet Control Parity Circuitry Test,* for example, you may also clear errors generated from other tests in the testing sequence..

Active PKT-CTRL

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Control Reset Test (#586)			D
Packet Control Parity Circuitry Test (#584)		X	ND
Packet Control Loop Around Test (#585)	X	X	ND
Packet Control Error Counter Read and Clear Test (#583)		X	ND

1 D = Destructive; ND = Nondestructive

Standby PKT-CTRL

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Control Reset Test (#586)	X	X	ND
Packet Control Loop Around Test (#585)	X	X	ND
Packet Control Error Counter Read and Clear Test (#583)	X	X	ND

1 D = Destructive; ND = Nondestructive

Packet Control Error Counter Read and Clear Test (#583)

This test involves reading and clearing the error counters on the Packet Control circuit pack. The test is performed by sending multiple maintenance requests to the Packet Control circuit pack and waiting for the response to each of the "read and clear" commands from the circuit pack.

Table 11-268. TEST #583 Packet Control Error Counter Read and Clear Test

Error Code	Test Result	Description/ Recommendation
1029 2011 2012 2013 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-268. TEST #583 Packet Control Error Counter Read and Clear Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	FAIL	The Packet Control circuit pack is not operational. A busied-out Packet Control circuit pack can still be operational. 1. Determine if the Packet Control circuit pack has an active major alarm (via the **display alarm** command). If it does, follow the recommended repair procedures to retire the alarm. Once the alarm is retired, the original command can be retried. 2. If the Packet Control circuit pack does not have an active major alarm, wait one minute and retry the original command. If the Error Code 1141 is again observed, go to the next step. 3. If the Packet Control circuit pack is on the active SPE and is not currently busied-out, issue the **busyout packet-control C** command. Issue the **reset packet-control C** command. If the reset command fails, follow the recommended repair procedures for Test #586. If the reset command passes, issue the **release packet-control C** command (if the Packet Control circuit pack is on the active SPE), and reissue the original command. If the original command again aborts with Error Code 1141, escalate the problem.

Continued on next page

Table 11-268. TEST #583 Packet Control Error Counter Read and Clear Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	Software was unable to read and clear the Packet Control circuit pack error counters. 1. Retry the command. 2. If the same error code is observed, and the Packet Control circuit pack is on the active SPE and is not currently busied-out, issue the **busyout packet-control C** command. Issue the **reset packet-control C** command. If the reset command fails, follow the recommended repair procedures for Test #586. If the reset command passes, issue the **release packet-control C** command (if the Packet Control circuit pack is on the active SPE), and then reissue the original command.
	PASS	The Packet Control circuit pack succeeded in servicing the read and clear error counter requests.

Packet Control Parity Circuitry Test (#584)

This test checks the error detection capability of the Packet Control circuit pack's circuitry by verifying that it correctly identifies frames on the Packet Bus with parity errors.

NOTE:
This test aborts in a High or Critical Reliability system, or in a system with an alarmed PPN Packet Bus.

Table 11-269. TEST #584 Packet Control Parity Circuitry Test

Error Code	Test Result	Description/ Recommendation
1024	ABORT	The Packet Control circuit pack's parity circuitry is currently being used by another maintenance test. 1. Retry the command at one-minute intervals a maximum of five times.
1139	ABORT	The PPN Packet Bus is alarmed. 1. Try to retire the alarm associated with the PKT-BUS (Packet Bus). Refer to the Alarm log via the **display alarm** command. 2. Retry the command when the alarm associated with the Packet Bus circuit pack is retired.

Continued on next page

Table 11-269. TEST #584 Packet Control Parity Circuitry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The Packet Control circuit pack is not operational. **NOTE:** A busied-out Packet Control circuit pack can still be operational. 1. Determine if the Packet Control circuit pack has an active major alarm (via the **display alarm** command). If it does, then follow the recommended repair procedures to retire the alarm. Once the alarm is retired, the original command can be retried. 2. If the Packet Control circuit pack does not have an active major alarm, then wait one minute and retry the original command. If the Error Code 1141 is observed again, go to the next step. 3. If the Packet Control is not currently busied-out and is on the active SPE, issue the **busyout packet-control C** command. Issue the **reset packet-control C** command. If the reset command fails, follow the recommended repair procedures for Test #586. If the reset command passes, issue the **release packet-control C** command (if the Packet Control circuit pack is on the active SPE), and then reissue the original command. If the original command again aborts with Error Code 1141, escalate the problem.
1143	ABORT	The test should not be run in a High or Critical Reliability system. 1. No action is required since the parity circuitry is not used to monitor the Packet Bus in a High or Critical Reliability system.
2100	ABORT	Was unable to allocate necessary resources. 1. Retry the command at one-minute intervals a maximum of five times.

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Table 11-269. TEST #584 Packet Control Parity Circuitry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The Packet Control parity circuitry is malfunctioning. 1. Issue **test packet-control C long** command to retry the test. 2. This could be caused by a Packet Bus fault. Refer to Chapter 9, "Packet Bus Fault Isolation and Correction" for the procedures to be followed. 3. The Packet Control circuit pack needs to be replaced. However, it is likely that the Packet Control is providing service, and only its ability to maintain the Packet Bus is affected by the fault. If the Packet Control appears to be providing service (packet endpoints are functioning and/or the **status packet-control C** command indicates that links are established), it is not critical to replace the circuit pack immediately, and a time may be chosen to minimize customer down-time.
	PASS	The Packet Control parity circuitry is functioning properly.

Packet Control Loop Around Test (#585)

This test checks whether the Packet Control circuit pack can send and receive data correctly. The test performs the following major functions:

1. Establishes an LAPD link from the Packet Control circuit pack to itself. (See Figure 11-87.)
2. Transmits and receives test data over the testing link.

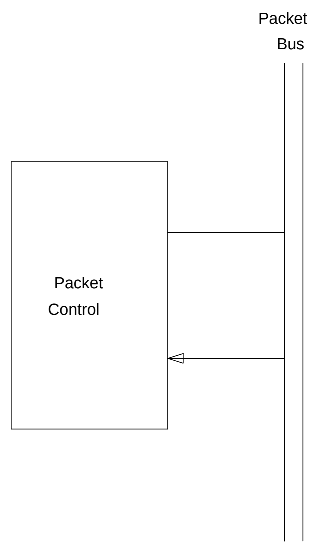

Figure 11-87. Test Configuration

Table 11-270. TEST #585 Packet Control Loop Around Test

Error Code	Test Result	Description/ Recommendation
1029 2011 2012 2013 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1139	ABORT	The Packet Bus is alarmed. 1. Try to retire the alarm associated with the Packet Bus. Refer to the Alarm Log via the **display alarm** command. 2. Retry the command when the alarm associated with the Packet Bus circuit pack is retired.

Continued on next page

Table 11-270. TEST #585 Packet Control Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1141	ABORT	The Packet Control circuit pack is not operational. **NOTE:** A busied-out Packet Control circuit pack can still be operational. 1. Determine if the Packet Control circuit pack has an active major alarm (via the **display alarm** command). If it does, follow the recommended repair procedures to retire the alarm. Once the alarm is retired, the original command can be retried. 2. If the Packet Control circuit pack does not have an active major alarm, wait one minute and retry the original command. If the Error Code 1141 is again observed, go to the next step. 3. If the Packet Control circuit pack is not currently busied-out and is on the active SPE, issue the **busyout packet-control C** command. Issue the **reset packet-control C** command. If the reset command fails, follow the recommended repair procedures for Test #586. If the reset command passes, issue the **release packet-control C** command (if the Packet Control circuit pack is on the active SPE), and then reissue the original command. If the original command again aborts with Error Code 1141, escalate the problem.
2500	ABORT	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-270. TEST #585 Packet Control Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1-3	FAIL	Maintenance was unable to establish a loop around link from the Packet Control circuit pack back to itself, or was unable to receive the data that was sent out over one side of the loop around link. 1. Issue **test packet-control C short** command to retry the test. 2. If the same error code is observed, maintenance software automatically escalates the testing. No specific action is required.
	PASS	The Packet Control circuit pack can send and receive data correctly.

Packet Control Reset Test (#586)

This test resets the Packet Control circuit pack, downloads Packet Control circuit pack firmware form tape, and then causes the Packet Control circuit pack to begin operation.

WARNING:

This test is destructive and disrupts service when run on the Packet Control circuit pack in the Active SPE. This test is not destructive when run on the Packet Control circuit pack in the Standby SPE of a High or Critical Reliability system. When this test is run on the Packet Control circuit pack on the Active SPE, the "busyout packet-control C" command must be executed first. Once testing has been completed, a busied-out Packet Control should be released via the release packet-control C command.

Table 11-271. TEST #586 Packet Control Reset Test

Error Code	Test Result	Description/ Recommendation
1029 2011 2012 2013 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1015	ABORT	The Packet Control circuit pack is not busied out. 1. Retry the command after running the **busyout packet-control C** command.

Continued on next page

Table 11-271. TEST #586 Packet Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1152	ABORT	The Packet Control circuit pack hardware was successfully reset and the circuit pack was successfully put back into service. However, a new image of Packet Control circuit pack firmware was not able to be downloaded from the tape, because the tape was unavailable. Nonetheless, the existing firmware on the circuit pack is valid, and there is no need to repeat this test.
2500	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1-3	FAIL	The reset test failed. 1. Retry the command. 2. If it fails again with the same error code, replace the Packet Control circuit pack.

Continued on next page

Table 11-271. TEST #586 Packet Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
5	FAIL	The SPE could not communicate with the Packet Control circuit pack. This indicates that either the Packet Control circuit pack is not installed or that it has failed. 1. Examine the appropriate carrier to determine if there is a Packet Control circuit pack in the correct slot. If there is, go to the next step. If there isn't, the problem is that the Packet Control circuit pack is administered (that is, the "Packet Bus Activated?" field on the Maintenance-Related System Parameters Form is set to "y") but the circuit pack isn't installed. If the system is supposed to have a Packet Control circuit pack, the system must be upgraded appropriately (see upgrade documentation). If the system is not supposed to have a Packet Control circuit pack, then the Packet Control circuit pack should be unadministered by setting the "Packet Bus Activated?" field on the Maintenance-Related System Parameters Form to "n." Refer to the "Maintenance-Related System Parameters Form" section in Chapter 5, "Routine Maintenance Procedures" for more information on the "Packet Bus Activated?" field. 2. Retry the command. 3. If it fails again with the same error code, replace the Packet Control circuit pack.

Continued on next page

Table 11-271. TEST #586 Packet Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1150 1188 1189 1190	FAIL	The Packet Control circuit pack was not successfully downloaded, and the Packet Control circuit pack currently does not contain valid downloadable firmware. The error codes have the following meanings: 1150- Generic tape error (not any of the following three errors) 1188- Internal system error 1189- Tape currently in use 1190- No tape cartridge in tape drive 1. Verify that there is a tape cartridge in the tape unit. 2. If the tape unit is in use (the yellow LED on the tape drive is on and there is tape cartridge motion), wait until the first request is complete. **If there does not appear to be tape motion and/or the yellow LED on the tape drive is not on, then go to the next step.** 3. Retry the command at one-minute intervals a maximum of three times. 4. Verify that the tape unit is not alarmed. Use the **display alarm** command and refer to the TAPE Maintenance documentation for recommended repair procedures to retire the alarm, if one exists; otherwise go to the next step. 5. If the test has failed consistently with the 1150 error code, then escalate the problem. If the test has failed consistently with the 1188 error code, replace the tape cartridge and then retry the reset command. If this does not correct the problem, then escalate the problem. If the test failed consistently with the 1189 error code, then escalate the problem. If the test failed consistently with the 1190 error code, then replace both the tape cartridge and the tape drive (refer to "Tape Maintenance and Repair Procedures" in the TAPE section for directions on replacing the tape drive).

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Table 11-271. TEST #586 Packet Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2064	FAIL	The downloaded firmware cannot be executed with this hardware vintage of the Packet Control circuit pack. 1. Retry the command. 2. If it fails again with the same error code, replace the tape cartridge and retry the reset command. If the test fails with this same error code, then escalate the problem.
2065	FAIL	The tape does not contain valid Packet Control circuit pack firmware. 1. Retry the command. If the same error code is returned, replace the tape and then retry the command. If the test continues to fail with this error code, then escalate the problem.
2073	FAIL	After being downloaded from the tape, the Packet Control circuit pack does not contain valid downloadable firmware in its memory. 1. Retry the command. 2. If the tests fails again with the same error code, then the tape may contain corrupted Packet Control circuit pack firmware. Replace the tape and retry the command. If the test still fails with this error code, then replace the Packet Control circuit pack. If the test continues to fail, escalate the problem.

Continued on next page

Table 11-271. TEST #586 Packet Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2102	FAIL	As the Packet Control circuit pack firmware was being downloaded from system tape, a block of data could not be read from the tape. This indicates a problem with the tape unit, and not with the Packet Control circuit pack. 1. Test the TAPE with the long option and with a repeat option of 3. If any of the tests fail, or if there are any tape alarms, refer to the TAPE Maintenance documentation and follow the recommended repair procedures. If a tape problem is detected and then fixed, then retry the reset command. 2. If no tape problem was detected in the previous step, then there may be a problem with the area on the tape where the Packet Control circuit pack firmware resides. Replace the tape cartridge and then retry the reset command. 3. Escalate the problem.
2500	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	The reset command passed and the Packet Control circuit pack is operational. If the Packet Control circuit pack was busied-out, it needs to be released (via the **release packet-control C** command) before it can be considered in service.

PMS-LINK (Property Management System Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PMS-LINK	MINOR	test pms l	PMS Link
PMS-LINK	WARNING	test pms	PMS Link

Property Management System (PMS) is a stand-alone computer system that a hotel/motel-type and a hospital-type environment use for services such as reservations, registration, messaging, housekeeping, night audit, billing, and inventory. The PMS Link provides a communications channel between DEFINITY Generic 1 or Generic 3iV2 and a customer-owned PMSs so that the PMS can interrogate the system about the information related to the following features:

- Message Waiting Notification
- Controlled Restriction
- Housekeeping Status
- Check-in/Check-out
- Room Change/Room Swap

Refer to *DEFINITY Communications System Generic 3 Feature Description*, 555-230-204 for details on the PMS feature. The PMS Link is administered to a data extension that provides a standard EIA 232C interface to the PMS. A PMS can be connected through a data module (PDM, MPDM, DTDM) and a port on the TN754 or TN754B Digital Line circuit pack, or through an ADU and a port on the TN726 Digital Line circuit pack.

PMS Link Maintenance provides a strategy for maintaining the link between DEFINITY Generic 1 and Generic 3iV2 and a PMS device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Link Maintenance uses a "try-and-wait" mechanism for maintaining the PMS Link. If a PMS Link is torn down due to an error, PMS Link Maintenance attempts to bring up the link immediately. If the trial of "Link Setup" fails, PMS Link Maintenance waits for five minutes before the next retry. If the number of retries reaches the value of a threshold (12), a Minor alarm is raised for service attention.

PMS Link Maintenance does not cover the maintenance of the elements composing the PMS physical link [the external PMS device, Data Module (PDM/MPDM/DTDM), and Digital Line Port of TN754 or TN754B Digital Line circuit pack, ADU and Data Line Port of TN726 Data Link circuit pack, and Data Channels on TN777 Network Control circuit pack]. If PMS Link Maintenance cannot restore the PMS Link, then the maintenance tests of these individual components of the PMS Link must be executed to diagnose faults. If system technician-demanded **test pms-link** command fails, no alarm is generated.

Procedures for Restoring the PMS Link

1. Determine the status of the PMS Link.

   Enter **status pms** command and make sure that the PMS Link is not busied out for maintenance. If the link is "down," then continue with the next step.

2. Where does the PMS Link connect?

   Enter **display system hospitality** and find out the destinations of the PMS Link.

3. Determine the status of the data extension.

   Enter **status data <extension>** command and verify whether the data extension is in in-service/idle state. If the data extension is NOT available, then look for the extension number in Alt Name field of Hardware Error Log. Refer to the XXX-BD (Common Port Circuit Pack) Maintenance documentation for resolutions.

4. Is a data channel on Network Control circuit pack in in-service/idle state?

   Enter **list data** command and find out the extension numbers of data channels on Network Control circuit pack. Enter **status data <extension>** command and make sure that at least one data channel is in in-service/idle state. If no data channel is available, then look for DATA-CHL/DATA-CON/DATA-BD errors in the Hardware Error Log. If present, refer to the DATA-BD (Network Control Circuit Pack) Maintenance documentation; if not present, escalate the error.

5. Is the external PMS device available?

   Make sure that the PMS device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the PMS device.

It is recommended that you busy out the PMS Link before executing maintenance tests over objects composing the PMS Link. If the PMS Link is busied out, then all PMS Link maintenance actions are deactivated. The interference to tests of other MO is off.

Hardware Error Log Entries and Test to Clear Values

PMS Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test pms sh r 1
18 (a)	0	busyout pms-link	WARNING	OFF	release pms-link
257 (b)	0-6, 99, 255	Link Retry Test (#215)	MINOR/ WARNING[2]	OFF	test pms-link l
513 (c)	0-6,255	None			test pms-link
769 (d)	0-6,255	None			
1025 (e)	4x[3]	None			
1281 (f)	1x[3]	None			
1537 (g)	Nx[3]	None			
1793 (h)	0-6,255	None			test pms-link
2049 (i)	0-6,255	None			
2305 (j)	5x[3]	None			release pms-link or test pms-link
2561 (k)	0-6,255	None			test pms-link
2817 (l)	10x[3] 20x[3] 30x[3]	None			
3073 (m)	7x[3]	None			
3841 (n)	2x[3]	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

3 Is any integer.

Notes:

a. The PMS Link has been busied out for system technician-demanded maintenance via the **busyout pms-link** command. The link is torn down. Enter the **release pms-link** command to restore the link.

b. The Link Retry Test (#215) fails. The Aux Data field contains either the Channel ID of Data Channels on Network Control circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04) or an Error Type of 99 indicating no data channels are available for setting up the link, or an Error Type of 255 for the internal system error generated upon initialization or power-up. Refer to the "Procedures for Restoring the PMS Link" section for resolution.

c. The PMS physical link is down due to the following causes: cable to the PMS device is disconnected; the PMS device is powered off; or the data extension to which the PMS device connects has been busied out. The Aux Data field contains the Channel ID of Data Channels on Network Control circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04) or an Error Type of 255 for the internal system error generated upon initialization or power-up. Check the connectivity of wire and cable among wall jacket, data module, and the PMS device. Enter **status data <extension>** and verify that the data extension of the PMS device is in in-service/idle state. If the data extension is not available, then refer to the "Procedures for Restoring the PMS Link" section for recommended repair strategy.

d. No communication between DEFINITY Generic 1 or Generic 3iV2 and PMS for a period of time (the time is specified in "system hospitality" administration). The PMS Link is torn down. To clear this error, refer to the "Procedures for Restoring the PMS Link" section.

e. The link was taken down because the switch could not receive an incoming message from the PMS. The message from the PMS repeatedly had corrupted data or the switch received requests for acknowledgment but never received a message to be processed. If this error type recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

f. The link was taken down because the switch could not send an outgoing message. The message, which was sent but not acknowledged, was flushed. If this error type recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

g. The PMS has been busied out for maintenance at the request of the PMS. The PMS Link is torn down. The reason code (N), if present, is that supplied by the PMS in the request message. If this error type recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. No alarm is raised against this error.

h. PBX buffer overflows due to either heavy call traffic or PMS protocol message rate being faster than the PMS/PBX protocol specifications allow. The PMS Link is torn down. PMS Link maintenance software waits for five minutes before attempting to set up the link again. If this error type recurs frequently (that is, more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log (see Note).

NOTE:
The PMS should be checked for adherence to message rate defined in the PMS/PBX protocol specifications. No alarm is raised against this error.

i. The attempt to swap the database between PBX and PMS failed three times consecutively due to excessive PMS/PBX protocol violations, buffer overflows, or PMS Link outages. The PMS Link is NOT torn down. If this error type recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. No alarm is raised against this error.

j. The PMS Link has been busied out for system technician-demanded maintenance via the **busyout pms-link** command or has been brought down via the **test pms-link long** command. The PMS Link is torn down, and PMS Link maintenance stops attempting to reestablish the link in the case where the **busyout pms-link** command has been used. When the **test pms-link long** command has been used, PMS Link maintenance continues to try to reset the link. To restore the PMS Link after use of the **busyout pms-link** command, issue the **release pms-link** command. To restore the PMS Link after use of the **test pms-link long** command, issue the **test pms-link** command.

k. The PMS Link is physically established, but the protocol has not been started by the PMS before the protocol timer expires. The PMS Link is NOT torn down. If this error type recurs frequently (that is, more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

NOTE:
The PMS should be checked to make sure that it attempts to start the protocol according to the PMS/PBX protocol specifications. No alarm is raised against this error.

l. Error Type 2817:

Aux values of concern:

10x The PMS violated the application protocol. The first message after a request to initiate a database exchange was not the start of a database exchange. The message is processed. If this error type with this aux data value recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. See Note.

20x The PMS violated the application protocol. The start of a database exchange was received in a state in which it was not expected. The message is ignored. If this error type with this Aux data value recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. See the next Note.

30x The PMS violated the application protocol. The end of a database exchange was received when no exchange was in progress. The message is ignored. If this error type with this Aux Data value recurs frequently (that is, more than once a month), then advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

NOTE:
The PMS should be assessed for adherence to the PMS/PBX protocol specifications. No alarm is raised against this error.

m. The link was taken down by the switch because the threshold for application protocol violations has been exceeded by the PMS. The protocol never started and messages were received and/or messages were received in a state in which they were not expected. (Refer to Error Type 2817 for recommended strategy.)

n. Link was taken down by the switch because the threshold for link protocol violations has been exceeded by the PMS. PMS is sending "garbage" to the switch.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Link Retry Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down Test (#213)		X	D
Link Retry Test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is destructive.

This test disconnects the existing link between the system and the external PMS device. If the link has been disconnected already, then this test just returns "PASS." All resources allocated for a PMS Link are released after this test.

Table 11-272. TEST #213 Link Tear Down Test

Error Code	Test Result	Description/ Recommendation
40 50	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1010	ABORT	The PMS Link has been busied out and placed in the out-of-service state. 1. Enter **release pms-link** command to release the PMS Link from busyout state. 2. Retry **test pms long** command to execute the test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The PMS Link is torn down.

Link Retry Test (#215)

This test sends a message to the PMS software process to make a data call to the extension where the PMS device connects. If the PMS Link is already up, then this test passes without making any data call.

Table 11-273. TEST #215 Link Retry Test

Error Code	Test Result	Description/ Recommendation
10 20	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
30	ABORT	Internal System Error. 1. Refer back to the "Procedures for Restoring the PMS Link" section for resolution.
1010	ABORT	The PMS Link has been busied out and placed in the out-of-service state. 1. Enter **release pms-link** command to release the PMS Link from busyout state. 2. Retry **test pms** command to execute the test.
	FAIL	The PMS Link CANNOT be established. 1. Refer back to the "Procedures for Restoring the PMS Link" section for restoring the PMS Link.
	PASS	The PMS Link is up.

PMS-PRNT/JNL-PRNT (PMS Printer Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PMS-PRNT/JNL-PRNT	MINOR	test journal pms-log/wakeup-log l	PMS Printer/ Journal Printer
PMS-PRNT/JNL-PRNT	WARNING	test journal pms-log/wakeup-log	PMS Printer/ Journal Printer

NOTE:
PMS-PRNT stands for the pms-log printer. JNL-PRNT stands for the wakeup-log printer. Since the maintenance strategy for the both the JNL-PRNT and PMS-PRNT MOs is the same, both of these MOs are described in this section.

In DEFINITY Generic 1 and Generic 3iV2, there are up to two journal printers. They are identified as the wakeup-log printer which is shared between the Automatic Wakeup feature and the Emergency Access to Attendant feature to print scheduled reports and log of events, and the pms-log printer which is used as a backup of the PMS output device to print the audit trail data of all PMS transactions executed by the system and the PMS Housekeeping Status Change events while the PMS Printer Link is not available. The journal printer link is administered to a data extension that provides a standard EIA 232C interface to the printer. The printer can be connected through a data module (PDM, MPDM, DTDM) and a port on the TN754 or TN754B Digital Line circuit pack, or through an ADU and a port on the TN726 Data Line circuit pack.

PMS Printer Link Maintenance provides a strategy in the system for maintaining the link between the system and a PMS device (an external Journal Printer device). The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Printer Link Maintenance uses a try-and-wait mechanism for maintaining the PMS Printer Link. If a PMS Printer Link is torn down due to an error, PMS Printer Link Maintenance intends to bring the link up immediately. If the trial of Link Setup fails, PMS Link Maintenance waits for five minutes before the next retry. If the number of retries reaches the value of a threshold (15), a Minor alarm is raised for service attention.

PMS Printer Link Maintenance does not cover the maintenance of the elements composing the journal printer physical link, for instance, the external printer device, Data Module (PDM/MPDM/DTDM) and Digital Line Port of TN754 or TN754B Digital Line circuit pack, ADU and Data Line Port of TN726 Data Line circuit pack, and Data Channels on TN777 Network Control circuit pack. If PMS Printer Link Maintenance cannot restore the PMS Printer Link, then the maintenance tests of these individual components of the PMS Link must be executed to diagnose faults.

Procedures for Restoring the PMS Printer Link

1. Determine the status of the PMS Printer Link.

   Enter **status journal-printer wakeup-log|pms-log** command and make sure that the journal printer link is not busied out for maintenance. If the link is down, then continue to the next step.

2. Where does the journal printer link connect?

   Enter **display system hospitality** and find out the destinations of the PMS Printer Link.

3. Determine the status of the data extension.

   Enter **status data extension** command and verify whether the data extension is in the in-service/idle state. If the data extension is NOT available, then look for the extension number in Alt Name field of Hardware Error Log. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for resolutions.

4. Is a data channel on Network Control circuit pack in the in-service/idle state?

   Enter **list data** command and find out the extension numbers of data channels on Network Control circuit pack. Enter **status data extension** command and make sure that at least one data channel is in the in-service/idle state. If no data channel is available, look for DATA-CHL/DATA-CON/DATA-BD errors in the Hardware Error Log. If present, refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation; if not present, escalate the error.

5. Is the external printer device available?

   Make sure that the printer device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the printer device.

It is recommended that you busyout the PMS Printer Link before executing maintenance tests over objects composing the PMS Printer Link. If the PMS Printer Link is busied out, then all PMS Printer Link maintenance actions are deactivated. The interference to tests of other MOs is off.

Hardware Error Log Entries and Test to Clear Values

PMS-PRNT/JNL-PRNT Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test journal wakeup-log|pms-log sh
18 (a)	0	busyout journal wakeup-log/ pms-log	WARNING	OFF	release journal wakeup-log|pms-log
257 (b)	0, 3 to 6 255	Link Retry Test (#215)	MINOR/ WARNING[2]	OFF	test journal wakeup-log|pms-log 1
513 (c)	0, 3 to 6 255				test journal wakeup-log|pms-log
769 (d)					

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Both PMS Printer and Journal Printer are administered to the same extension, and the printer is not connected. Refer to the "Procedures for Restoring the PMS Printer Link" section for resolution.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. System Technician busied out the Journal Printer Link. The link is torn down. Enter **release** command to restore the link.

b. Link Retry Test (#215) fails. Physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. The Aux Data field contains the Channel ID of Data Channels on Network Control circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04), an Error Code 255 for the internal system error, or 0 which indicates that the data module connected to the PMS Printer Link is out-of-service. Refer to "Procedures for Restoring the PMS Printer Link" section for resolution.

c. Physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. The PMS Printer Link physical link is down due to the following causes: cable to the printer device is disconnected, the printer device is powered off, or the data extension where the printer device connects to has been busied out. The Aux Data field contains the Channel ID of Data Channels on Network Control circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04). Check the connectivity of wire and cable among wall jacket, data module, and the printer device. Enter **status data <extension>** and verify that the data extension of the printer device is in the in-service/idle state. If the data extension is not available, then refer to the "Procedures for Restoring the PMS Printer Link" section for resolution.

d. Link idle timer; link comes down. This error indicates that the printer device is in an off-line state, for example, paper jam or paper out for a printer device. Check the printer device and act promptly to put it back to on-line state. Enter **test journal wakeup-log|pms-log** command to set up the printer link.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Link Retry Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down Test (#213)		X	D
Link Retry Test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is destructive.

This test disconnects the existing link between the system and the external printer device. If the link has been disconnected already, this test just returns PASS. All resources allocated for a PMS Printer Link are released after this test.

Table 11-274. TEST #213 Link Tear Down Test

Error Code	Test Result	Description/ Recommendation
40	ABORT	Internal System Error.
50	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1010	ABORT	The link has been busied out to out-of-service. 1. Enter **release journal wakeup-log|pms-log** command to release the link from busyout state. 2. Retry **test journal wakeup-log|pms-log l** command to execute the test.
	FAIL	Internal System error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The link is torn down.

Link Retry Test (#215)

This test sends a message to the journal printer management software process to make a data call to the extension where the printer device connects to. If the journal printer link is already up, this test passes without making any data call.

Table 11-275. TEST #215 Link Retry Test

Error Code	Test Result	Description/ Recommendation
10	ABORT	Internal System Error.
20	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
30	ABORT	Internal System Error. 1. Refer to the "Procedures for Restoring the PMS Printer Link" section for instructions.
1010	ABORT	The PMS Printer Link has been busied out to out-of-service. 1. Enter **release journal wakeup-log|pms-log** command to release the link from busyout state. 2. Retry **test journal wakeup-log|pms-log l** command to execute the test.
	FAIL	The link CANNOT be established. 1. Refer to the "Procedures for Restoring the PMS Printer Link" section for instructions.
	PASS	The link is up.

POWER (Battery & Battery Charger) for AC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
POWER	MINOR	test environment P	Battery & Battery Charger

1 Where P is an appropriate port network number determined via the PORT field from the Alarm or Error Log.

Generic 1 and Generic 3iV2 offer two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configuration may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, PPN or EPN cabinet configuration aspects for a High or Critical Reliability system are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate section(s).

- For a single-carrier cabinet system, refer to the DC-POWER (Single-Carrier Cabinet Power) Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: AC-POWER (AC Power) for AC-Powered Systems, CARR-POW (Carrier Port Power Unit) for AC-Powered Systems, or POWER (Battery & Battery Charger) for AC-Powered Systems.
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: AC-POWER (AC Power) for DC-Powered Systems, CARR-POW (Carrier Port Power Unit) for DC-Powered Systems, or POWER (Battery & Battery Charger) for DC-Powered Systems.

The G3iV1.1-286 or G3iV2-386 multicarrier cabinet is equipped with rechargeable batteries that can span short AC power outages. In a multicarrier PPN system with High or Critical Reliability, the cabinet can be powered for 10 seconds from the batteries. After this time, all port carrier power is shed and the control carrier is powered for another 10 minutes. In a High or Critical Reliability PPN system, these times are cut to five seconds and five minutes, respectively. In an EPN multicarrier cabinet, the entire cabinet can be powered for 15 seconds from the batteries, after which time the entire cabinet is powered down.

In a multicarrier cabinet system, the POWER (Battery & Battery Charger) MO represents the battery charger and the battery which are located in the lower left corner of the cabinet. Should anything go wrong with the battery or charger, they must be replaced using the procedure described in "Replacing the Battery and Battery Charger" below. The system detects one of the following three problems with the batteries or charger:

1. Reserve Fault—The charger has detected a problem within itself or the batteries and has notified the system.
2. High Charge Rate—The batteries are charging at a high charge rate. This means that batteries with a low charge are being recharged or that a problem may exist with the batteries or the charger.
3. Prepare to Disconnect (Low Battery)—The batteries are in danger of being drained to a point where the batteries would be damaged. This warning often occurs after multiple power failures.

   The batteries take 30 hours to fully charge after being drained. A fully charged battery pack should bridge two power failures without causing a low battery warning to occur.

Replacing the Battery and Battery Charger

Use the procedure below to replace the Battery and Battery Charger:

1. Move the power switch on the battery charger to OFF.

   WARNING:
   Always turn off the battery charger before replacing the batteries. Failure to do so results in damage to the 397B battery charger.

2. Disconnect the cord from the outlet on the front of the battery charger.
3. Remove the screw at the top left of the cover and open the cover to access the charger.
4. Check the battery voltages at the test points. The test points on the CE Distribution Unit check all 3 batteries wired in series (the voltages should read 144 volts, 3X48 volts = 144 volts) .

   NOTE:
   An ordinary voltmeter can be used to check battery voltages at the test points, but it may not produce valid results. If the battery voltage readings are below 48 volts (the voltages at test points should read 144 volts, 3X48 volts = 144 volts), the battery is probably defective. However, a normal voltage reading does not necessarily mean the battery is good; under load, a defective battery with a normal reading on the voltmeter may discharge rapidly.

5. Check the battery dates and replace the batteries if they are more than four years old or if a POWER alarm is present.

   NOTE:
   If any defective batteries are found, replace all of them. Batteries are ordered in sets of three and should be replaced as such.

6. If no defective batteries are found, replace the entire charger.
7. Close the cover and secure it with the screw.
8. Reconnect the cord and move the power switch to ON.

Hardware Error Log Entries and Test to Clear Values

Battery & Battery Charger Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment P sh r 1
1	Any	Battery & Battery Charger Query Test (#5) (Error Code 8)	MINOR	ON	test environment P sh r 1
257	Any	Battery & Battery Charger Query Test (#5) (Error Code 4)	MINOR	ON	test environment P sh r 1
769	Any	Battery & Battery Charger Query Test (#5) (Error Code 2)	MINOR	ON	test environment P sh r 1
3840	1005 or 1028	Battery & Battery Charger Query Test (#5)		ON	test environment P sh r 1

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. Where P is an appropriate port network number determined via the Port field from the Alarm or Error Log.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test,* for example, you may also clear errors generated from other tests in the testing sequence. During this test, the status LED on the battery charger is lit and extinguished if the status of the battery charger is reported as normal. This event is a result of checking that the battery charger is connected.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query Test (#5)	X	X	ND
AC Power Query Test (#78) (a)	X	X	ND
Power Unit Query Test (carrier E) (#127) (b)	X	X	ND
Power Unit Query Test (carrier D) (#127) (b)	X	X	ND
Power Unit Query Test (carrier A) (#127) (b)	X	X	ND
Power Unit Query Test (carrier B) (#127) (b)	X	X	ND
Power Unit Query Test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Sensors Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to AC-POWER (AC Power) Maintenance documentation for a description of this test.

b. Refer to CARR-POW (Carrier Port Power Unit) Maintenance documentation for a description of this test

c. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

d. Refer to CABINET (Cabinet Sensors) Maintenance documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) Maintenance documentation for a description of this test.

NOTE:
This test only shows up in the test sequence if there is a Tone-Clock circuit pack in the port network being tested.

Battery & Battery Charger Query Test (#5)

This test queries the Maintenance/Tape Processor in a multicarrier cabinet PPN system without High or Critical Reliability, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN for the status of the battery pack and battery charger, and reports the result. During this test, the status LED battery charger is lit and extinguished if the status of the battery charger is reported as normal. This event is a result of checking that the battery charger is connected.

Table 11-276. TEST #5 Battery & Battery Charger Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Battery Charger is not connected. 1. If the system has a UPS supplying the power, ignore this error since the UPS supplies the power, not the battery and battery charger. 2. The batteries probably need charging and may be drained if there were power outages. Reconnect the battery charger to allow the batteries to recharge. If Test #5 is run before the batteries are completely charged, the test fails. 3. Wait 24 hours and rerun the test.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier (PPN or EPN). Look for and resolve all AC-POWER and CARR-POW alarms in a multicarrier cabinet system or DC-POWER alarms in a single-carrier cabinet system. Repeat the test. 3. If the test continues to ABORT with a 2000 error code, check for and resolve all DUPINT (Duplication Interface) errors in a Duplicated Option PPN, PR-MAINT (Maintenance/Tape Processor) errors in a standard PPN, or MAINT (EPN Maintenance circuit pack) errors in an EPN. Repeat the test. 4. If the test continues to ABORT with a 2000 error code, escalate the problem.
2028	ABORT	Internal System Error prevented the extinguishing of the Battery Charger status LED. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The system is in nominal power holdover, and the battery is currently so low that the system disconnects power very shortly. 1. If power returns, the port carriers in the PPN should power up again. All the circuit packs should be reinserted, and the system should continue to operate normally. There will probably be a Minor alarm against Battery & Battery Charger because the batteries are recharging. 2. If power does not return, the system shuts down to prevent damage to the batteries. If power is restored, the system reboots. **No manual intervention is required.** 3. Rerun the test. If the test still fails, the PR-MAINT (Maintenance/Tape Processor) in a multicarrier cabinet PPN system without High or Critical Reliability, the DUPINT (Duplication Interface) circuit pack in a PPN for a system with High or Critical Reliability, or the EPN MAINT (Maintenance) circuit pack in an EPN could be reporting this condition incorrectly. Resolve all alarms on these MOs and rerun the test. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that ARE NOT be detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, follow normal escalation procedures.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4	FAIL	The battery is currently being charged at the high charge rate. 1. After 30 hours, the battery should be fully charged, and this error should disappear. 2. If after 30 hours the battery is still in the high charge rate, an alarm is raised. Display the Error Log with the **display errors** command and select the category "environ" to display only environment-related errors. Look for POWER errors of type 257. The FIRST OCCURRENCE of this error indicates the time when the battery started charging. Use this time as the starting point to determine if the battery has been charging for 30 hours. If the battery has been charging for 30 hours, then replace the battery. **CAUTION:** *Read the section, "Replacing the Battery and Battery Charger" before proceeding.*

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
4	FAIL *(cont'd.)*	3. If the batteries were replaced, it can take up to 24 hours for the new batteries to be charged (new batteries are shipped uncharged). If Test #5 is run again before the batteries are completely charged, the test fails. If the charger was replaced, some time must be allowed for the new charger to recharge the batteries. Therefore, in either case, wait at least 24 hours and rerun the test. If the test still fails, the PR-MAINT (Maintenance/Tape Processor) in a multicarrier cabinet PPN system without High or Critical Reliability, the DUPINT (Duplication) Interface circuit pack in a PPN for a system with High or Critical Reliability, or the EPN MAINT (Maintenance) circuit pack in an EPN could be reporting this condition incorrectly. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that ARE NOT be detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. Resolve all alarms on these MOs, and rerun the test. If the test still fails, escalate the problem.
6	FAIL	This indicates that Error Codes 2 and 4 have occurred. Refer to these descriptions. Also, refer to the description for Error Code 14 for this test.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
8	FAIL	**NOTE:** For a Global AC MCC (J58890CH) use the procedures outlined in step 3. There is a reserve power fault. A problem exists with the battery charger (more probable) or the battery (less probable). 1. Replace the battery charger or the battery. The fault should disappear. However, the test fails with Error Code 4 if the battery is charging. **WARNING:** *Always turn off the battery charger before replacing the batteries.* 2. Rerun the test. If the test still fails with an error code other than 4 (that is, there is something wrong besides the battery needing charging), the PR-MAINT (Maintenance/Tape Processor) in a multicarrier cabinet PPN system without High or Critical Reliability, the DUPINT (Duplication Interface) circuit pack in a PPN for a High or Critical Reliability, or the EPN MAINT (Maintenance) circuit pack in an EPN could be reporting this condition incorrectly. Resolve all alarms on these MOs and rerun the test. There are failures that can occur on the Maintenance/Tape Processor, Duplication Interface, and EPN Maintenance circuit pack that ARE NOT be detected by the respective maintenance, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, then follow normal escalation procedures.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
8 *(cont'd.)*	FAIL *(cont'd.)*	3. Procedures for a Global MCC (J58890CH): a. Look to see if any "red" LEDs are "on" on any of the rectifier modules or the BIU (Battery Interface Unit) located in the Power Distribution Unit (J58890CH). b. If the BTW (Battery Temp Warning) LED on the BIU is "on" check the batteries for a over temp condition[(a)] if temp is normal[(a)] replace the BIU, If the test still fails replace the battery in a small battery system. For a large battery system escalate the problem. c. If the BIF (Battery Interface Unit) LED is "on" replace the battery interface unit. d. If the BNA (Battery Not Available) LED is "on" check the battery connections including connector J20. e. If you have an alarm and all LEDs are ok (PWR OK and BOK) on the rectifier modules, and the BIU (Battery Interface Unit), make sure the BIU and the RM0850 rectifiers are seated properly (plugged in). If the BOK LED on the BIU is ok use the following information to check the number of rectifiers serving this cabinet: Number of carriers per cabinet | Number of rectifiers per cabinet 1 — 2 2 — 3 3 — 3 4 — 4 5 — 4 If the number of rectifiers is correct replace the maintenance circuit pack in the EPN or PPN. 4. If the test still fails, then follow normal escalation procedures.

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Table 11-276. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10	FAIL	This indicates that Error Codes 2 and 8 have occurred. Refer to these descriptions. Also, refer to the description for Error Code 14 for this test.
12	FAIL	This indicates that Error Codes 4 and 8 have occurred. Refer to these descriptions. Also, refer to the description for Error Code 14 for this test.
14	FAIL	This indicates that Error Codes 2, 4, and 8 have occurred. Refer to these descriptions. **NOTE:** This could also indicate that the detection logic on the DUPINT (Duplication Interface), PR-MAINT (Maintenance/Tape Processor), or EPN MAINT (Maintenance) circuit pack is defective. Such an error will not be detected by the respective maintenance. If many environment tests are failing, replace the suspect circuit pack (depending on system configuration).
	PASS	The Maintenance/Tape Processor in a multicarrier cabinet PPN system without High or Critical Reliability, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN have reported that the status of Battery & Battery Charger is good.

POWER (Battery & Battery Charger) for DC-Powered Systems

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
POWER	MINOR	test environment P	Battery & Battery Charger

1 Where P is an appropriate port network number determined via the Port field from the Alarm or Error Log.

DEFINITY Generic 1 and Generic 3iV2 offer two basic cabinet type configurations: (1) the multicarrier cabinet system and (2) the single-carrier cabinet system. Both cabinet system configurations may be powered by either an external AC or DC power source.

NOTE:
For environment maintenance, the PPN or EPN cabinet configuration aspects for a High or Critical Reliability system are irrelevant.

The environment maintenance strategy to be used depends on both the cabinet configuration and the type of powering. Therefore, refer to the following list to find the appropriate section(s).

- For a single-carrier cabinet system, refer to the DC-POWER (DC Power) Maintenance documentation for environment maintenance strategy.
- For a multicarrier cabinet system using an external AC power source, refer to one or more of the following Maintenance documentation sections: AC-POWER (AC Power) for AC-Powered Systems, CARR-POW (Carrier Port Power Unit) for AC-Powered Systems, or POWER (Battery & Battery Charger) for AC-Powered Systems.
- For a multicarrier cabinet system using an external DC power source, refer to one or more of the following Maintenance documentation sections: AC-POWER (AC Power) for DC-Powered Systems, CARR-POW (Carrier Port Power Unit) for DC-Powered Systems, or POWER (Battery & Battery Charger) for DC-Powered Systems.

In a DC-powered multicarrier cabinet system, the POWER MO still exists, but serves no functional purpose. Because the system cannot determine the type of powering provided, all POWER tests should always pass or abort. Since the tests should never fail, POWER alarms should not be raised.

Hardware Error Log Entries and Test to Clear Values

Battery & Battery Charger Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]*	0	Any	Any	Any	test environment P sh r 1
1	Any	Battery & Battery Charger Query Test (#5) (Error Code 8)	MINOR	ON	test environment P sh r 1
257	Any	Battery & Battery Charger Query Test (#5) (Error Code 4)	MINOR	ON	test environment P sh r 1
769	Any	Battery & Battery Charger Query Test (#5) (Error Code 2)	MINOR	ON	test environment P sh r 1
3840 (a)	1005 or 1028	Assoc. Test Battery & Battery Charger Query Test (#5)		ON	

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. This error occurs only in a multicarrier cabinet and can be ignored but not cleared for DC-powered systems.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Battery & Battery Charger Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query			
Test (#5)	X	X	ND
AC Power Query Test (#78) (a)	X	X	ND
Power Unit Query Test (carrier E) (#127) (b)	X	X	ND
Power Unit Query Test (carrier D) (#127) (b)	X	X	ND
Power Unit Query Test (carrier A) (#127) (b)	X	X	ND
Power Unit Query Test (carrier B) (#127) (b)	X	X	ND
Power Unit Query Test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query Test (#124) (c)	X	X	ND
Cabinet Sensors Query Test (#122) (d)	X	X	ND
External Alarm Lead Query Test (#120) (e)	X	X	ND
Analog Ring Generator Initialization Test (#117) (f)	X	X	ND
Analog Ring Generator Query Test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to AC-POWER (AC Power) documentation for a description of this test.

b. Refer to CARR-POW (Carrier Port Power Unit) for AC- and DC-Powered Systems Maintenance documentation for a description of this test.

c. Refer to EMG-XFER (Emergency Transfer) documentation for a description of this test.

d. Refer to CABINET (Cabinet Sensors) documentation for a description of this test.

e. Refer to EXT-DEV (External Alarm) documentation for a description of this test.

f. Refer to RING-GEN (Analog Ring Generator) documentation for a description of this test.

NOTE:
This test shows up in the test sequence only if there is a TN768 or TN780 Tone-Clock circuit pack in the port network being tested.

Battery & Battery Charger Query Test (#5)

This test queries the Maintenance/Tape Processor in a standard PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in an EPN for the status of the battery pack and battery charger, and reports the result. In a DC-powered system, this test should never fail. During this test, the status LED on the battery charger is lit and extinguished if the status of the battery charger is reported as normal. This event is a result of checking that the battery charger is connected.

Table 11-277. TEST #5 Battery & Battery Charger Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
1005	ABORT	Battery charger is not connected since the system uses DC power and the battery charger and battery are for AC-powered systems. 1. Ignore this error in DC-powered systems.
2000	ABORT	Response to the test request was not received within the allowable time period.
2028	ABORT	Internal System Error prevented the extinguishing of the Battery Charger status LED. 1. Although this test is not relevant for DC-powered systems, this error should trigger close monitoring of the system as this error means that internal system problems exist.
2029	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-277. TEST #5 Battery & Battery Charger Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
any	FAIL	The Maintenance/Tape Processor in a multicarrier cabinet Standard system PPN, the Duplication Interface circuit pack in a PPN for a High or Critical Reliability system, or the EPN Maintenance circuit pack in a multicarrier cabinet system EPN is incorrectly reporting a problem with power. If this test fails, the problem is with the circuit pack and not with POWER. 1. The suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. 2. If the test still fails, follow normal escalation procedures.
	PASS	All that can be inferred is that the PR-MAINT (Maintenance/Tape Processor) in a Standard system PPN, the DUPINT (Duplication Interface) circuit pack in a PPN for a High or Critical Reliability system, or the EPN MAINT (Maintenance) circuit pack in an EPN multicarrier cabinet system is working properly.

PR-MAINT (MainTenance Processor [TN790 RISC Systems])

MO Name As It Appears In Alarm Log	Alarm Level	Initial System Technician Command To Run	Full Name of MO
PR-MAINT	MIN[1]	test processor a/b sh/l	Maintenance/Tape Processor[2]

1 Alarms on the PROCR, and PR-MAINT maintenance objects (MOs) are indicated by the red LED on the Processor circuit pack.

2 The full Name of the MO in the TN790 RISC system is MainTenance Processor.

NOTE:
Prior to DEFINITY ECS Release 5, the full maintenance object (MO) name for a system with a TN773 processor circuit pack is PR-MAINT (Maintenance/Tape Processor). For a system with a TN786 processor circuit pack, the full Name of the MO is MainTenance Processor.

The TN790 Processor circuit pack is comprised of the RISC Processor (PROCR), the MainTenance Processor (PR-MAINT), and the Memory (PR-MEM). On the TN790 circuit pack, PR-MAINT is responsible for monitoring the sanity of the RISC Processor.

PR-MAINT contains the hardware required for controlling the environmental conditions. The Maintenance/Tape Processor provides the serial interfaces for the administration terminal and DCE port. The Maintenance Processor also provides the communications interface to INADS for alarm reporting and remote maintenance capability. INADS connectivity is through the internal or external modem. The external modem is connected to the DCE port. When the external modem is the administered modem option the internal modem is disabled.

The TN790 has a higher speed 9600 baud internal modem or can support an external modem connected to the DCE port.

Hardware Error Log Entries and Test to Clear Values

Maintenance/Tape Processor Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0[2]	0	Any	Any	Any	test processor a/b sh r 1
1(a)	Any	MTP Reset Test (#101)	MIN	ON	test processor a/b l r 3
257(b)	Any	MTP Sanity Handshake Test (#106)			test processor a/b r 2
513(c)	Any	MTP Analog Loop Around Test (#103)	MIN	ON	test processor a/b r 8
769(d)	Any	MTP Dual Port Ram Test (#104)	MIN	ON	test processor a/b l r 3
1025(e)	Any	MTP Outpulse Relay Test (#102)	MIN	OFF	test processor a/b r 5
1537(f)	Any	MTP SAT Loop Around Test (#228)	MIN	ON	test processor a/b r 3
1793(g)	Any	MTP Aux Loop Around Test (#229)	MIN	ON	test processor a/b r 3
2049(h)	Any	External Modem Present Test (#230)	MIN	OFF	test processor a/b r 2

1 The MTP Reset Test (#101) logs you off. The MTP Dual Port Ram Test (#104) can also log you off. You must manually repeat the command with the ‘‘long’’ option the designated number of times when testing from the PPN SAT.

2 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The MTP Reset Test (#101) has failed.

b. The MTP Sanity Handshake Test (#106) has failed.

c. The MTP Analog Loop Around Test (#103) has failed.

d. The MTP Dual Port Ram Test (#104) has failed. An error of 769 with an aux data of 5 indicates a hardware problem and testing will not clear it. The circuit pack should be replaced.

e. The MTP Outpulse Relay Test (#102) has failed.

f. The MTP SAT Loop Around Test (#228) has failed.

g. The MTP Aux Loop Around Test (#229) has failed.

h. The External Modem Present Test (#230) has failed.

NOTE:
Refer to the FAIL section of each test that fails for further instructions.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *MTP Reset Test,* for example, you may also clear errors generated from other tests in the testing sequence.

The following table is for the TN790 [RISC] System:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Cache Test (#895)(a)		X	ND
Processor Cache Audit (#896)(a)	X	X	ND
Processor Bus Timeout Exception Test (#82)(a)	X	X	ND
Processor BOOTPROM Checksum Test (#80)(a)	X	X	ND
Processor Write Buffer Test (#900)(a)	X	X	ND
Memory Burst Read Test (#908)(a)	X	X	ND
Read All Memory Test (#85)(a)		X	ND
Memory Parity Error Detection Test (#87)(a)	X	X	ND
Flash Memory Checksum Test (#86)(a)		X	ND
Memory Functional Test (#332) (b)(c)		X	D
MTP Outpulse Relay Test (#102)(d)	X	X	ND
External Modem Present Test (#230)(d)(e)	X	X	ND
MTP Analog Loop Around Test (#103)(d)	X	X	ND
MTP Sanity Handshake Test (#106)	X	X	ND
MTP SAT Loop Around Test (#228)	X	X	ND
MTP Aux Loop Around Test (#229)	X	X	ND
MTP Reset Test (#101)		X	D
MTP Dual Port Ram Test (#104)(d)		X	D

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to PROCR (TN790 RISC Processor) Maintenance documentation for a description of these tests.

b. Refer to PR-MEM (TN790 RISC Memory) Maintenance documentation for a description of these tests.

c. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a **reset system 4** command or a **reset system 5** command.

d. This test only runs on the Active SPE.

e. This test aborts if an external modem is not administered.

MTP Reset Test (#101)

This test is destructive. The test resets the MainTenance Processor. The destructive nature of this test causes the following:

- System Access Terminal to log off
- DCE port to terminate data transmission
- Any current memory card access to terminate and also to tear down any remote access INADS connection

Table 11-278. TEST #101 MTP Reset Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-278. TEST #101 MTP Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1196	FAIL	The MTP did not respond to being reset. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
1197	FAIL	The Maintenance Processor was reset, but it responded with a NOT PASS status, indicating that it did not pass initialization correctly. The MTP is not functioning correctly. The system should continue to function, but it will not have the ability to save translation to tape, or to read tape if the system needs to be rebooted. Environmental monitoring is lost, as is communication with the Standby Processor. 1. Repeat the command at one minute intervals a maximum of five times. 2. If test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
	PASS	The Maintenance Processor was reset, and it passed initialization correctly. The other MTP tests should be examined to verify that the MTP is functioning correctly. 1. Enter **test processor a/b** and verify that the MTP is functioning correctly.

MTP Outpulse Relay Test (#102)

This test is a nondestructive test.When the internal modem is administered, the test validates the correct operation of the remote access CO trunk used by INADS. The MTP first goes off-hook, then on-hook on this trunk. If the loop current is detected, the test passes. If the external modem is administered the MTP sends an AT command sequence that will cause the external modem to go OFF-HOOK and wait for dial-tone. If the modem detects dial-tone, the test passes. This test is not allowed if the remote access line is in use.

Table 11-279. TEST #102 MTP Outpulse Relay Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1018	ABORT	The test has been disabled via administration. 1. To enable the test, issue the **change system-parameters maintenance** command, and set the test remote access port field to ‘‘y.’’ (If you have an INADS line, set the field to ‘‘y.’’ 2. Rerun the test.
1030	ABORT	This test is not run on the Standby SPE.
1131	ABORT	INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. 1. If INADS is communicating with the switch the INADS trunk is working. There is no need to run this test. 2. Or if required. Wait about ten minutes(untill the INADS session is terminated) and then re-enter the command.
1000 2500	ABORT	System software resources required to run this test are not available. Internal system error.

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Table 11-279. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033		Couldn’t send MTP message. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	MTP did not respond to the test request. 1. Repeat the test at one minute intervals a maximum of five times. 2. If all MTP tests are aborting, execute the **test processor a/b long** command in order to reset MTP and to examine the results of the MTP Reset Test (#101). 3. Replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) 4. If only the MTP outpulse relay test is aborting, escalate the problem.
1050	ABORT	System could not determine if the testing of the INADS port is administered. 1. Enter the **change system-parameters maintenance** command. Verify that the “Test Remote Access Port?” field is set to “y.” 2. Repeat the command at one minute intervals a maximum of five times. 3. If the data on the Maintenance-Related System Parameters Form is correct, escalate the problem.

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Table 11-279. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	MTP reported test failure. No loop current detected. The following steps apply to either an internal or external modem (Some additional steps apply to an external modem only.). 1. Repeat the command at one minute intervals a maximum of five times. 2. For an external modem, if the test continues to fail: a. If Test #230 failed, use the external modem recommendations listed in Test #230. b. If Test #230 passes, the MTP most likely received a NO DIAL TONE response to the ATD command sent from the MTP. This problem is between the modem and the INADS trunk. 3. If the test continues to fail, examine the INADS trunk for connectivity, and manually check for loop current. 4. If there is no INADS trunk, this test should be disabled. To disable the test, issue the **change system-parameters maintenance** command, and change the Test Remote Access Port field to "n." 5. If the INADS trunk checks out okay, but the test still fails, check the backplane connector wiring. 6. If the backplane wiring checks out okay, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, 'Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)

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Table 11-279. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	MTP detected a loop current on the remote access port. 1. If the system cannot call INADS, or INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct. Approved external modems with factory default settings are expected to work if administered correctly using the **change system-parameters** command.

MTP Analog Loop Around Test (#103)

This test is a nondestructive test. The test does a loop around by using the MTP INADS channel. Test data is sent through the modem out toward the INADS trunk. The data is looped around before the actual trunk, and it comes back into the on-board modem. The data is then verified for integrity. The internal modem is tested when the internal modem is selected. The external modem is tested when the external modem is selected.

When an external modem is administered in place of the internal modem, the test loops data in the MTP DUART ahead of the connection to the external modem. This test also causes the MTP DUART to verify that **Clear-To-Send (CTS)** is being supplied by the modem.

NOTE:
The test does not send any data onto the INADS trunk. However, in order to pass, the test does require the trunk to be present

Table 11-280. TEST #103 MTP Analog Loop Around Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1018	ABORT	The test has been disabled via administration. 1. To enable the test, issue the **change system-parameters maintenance** command, and set the Test Remote Access Port field to ‘‘y.’’ 2. Rerun the test.
1030	ABORT	This test is not run on the Standby SPE.

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Table 11-280. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1131	ABORT	INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. 1. If INADS is communicating with the switch the INADS trunk is working. There is no need to run this test. 2. Or if required. Wait about ten minutes (until the INADS session is terminated) and then re-enter the command.
1000 2033	ABORT	System software resources required to run this test are not available. Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	MTP did not respond to the test request. 1. Repeat test at one minute intervals a maximum of five times. 2. If only the MTP Analog Loop Around Test is aborting, escalate the problem. 3. If all MTP tests are aborting, execute the **test processor a/b long** command in order to reset MTP, and examine the results of the MTP Reset Test (#101).
2500	ABORT	Internal System software Error 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-280. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1050	ABORT	System could not determine if the testing of the INADS port is administered. 1. Enter the **change system-parameters maintenance** command, and verify the entry for the Test Remote Access Port field. 2. Repeat the command at one minute intervals a maximum of five times. 3. If the data on the Maintenance-Related System Parameters Form is correct, escalate the problem.

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Table 11-280. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	MTP reported test failure. The system is not able to reliably contact INADS with alarm data. However, the system continues to provide good service. 1. For an internal modem: a. If MTP Outpulse Relay Test (#102) is also failing, check for the presence of the INADS trunk, and resolve any INADS trunk problems. b. If Test #102 passes, the fault is on the Processor circuit pack. The circuit pack should be replaced at your convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) 2. For an external modem: a. Check the power to the modem. b. Check the RS232 cable connections from the DCE terminal on the switch to the DTE connector on the modem. Transmit, Receive, RTS, and CTS signals must be communicating between the MTP DUART hardware and the modem hardware c. The MTP DUART or related circuitry on the processor circuit pack may have failed. The circuit pack should be changed at your convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)

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Table 11-280. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	For an internal modem—MTP detected correct data through the loop back connection. For an external modem—The test detected correct data through the loop back in the MTP DUART hardware ahead of the RS232 connection to the modem, and received a CTS signal from the external modem. 1. If the system cannot call INADS, or if INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct.

MTP Dual Port Ram Test (#104)

This test is destructive.

The test terminates any PPN SAT session, and it is a coordinated test of the MTP dual port ram (DPR). The DPR is a section of memory that is shared by the MTP and by the RISC Processor circuit pack. Control messages and data are passed through the DPR. The test forces both sides to read and write the DPR simultaneously in alternate locations.

The DPR test causes the PPN SAT to log off before the test result is displayed. The test result is determined according to the terminal from which the test is run. If the test is run from the PPN SAT, system technician should log back in and examine the Error Log for an error against PR-MAINT, with Error Type 769, no Aux Data. This error entry indicates that the MTP DPR Test failed and that the Processor circuit pack should be replaced. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)

NOTE:
If the test is being run from a terminal other than the PPN SAT (for example, EPN SAT, remote access, etc.), the test results are displayed on the screen.

NOTE:
A dial-up (through the INADS port) does not display the results discussed in the previous paragraph. However, a dial-up through data channels does display these results.

Table 11-281. TEST #104 MTP Dual Port Ram Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1000	ABORT	System software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1030	ABORT	This test in not run on the Standby SPE.
2000	ABORT	The response to the test request was not received within the allowable time period.
2028	ABORT	System software resources required to run this test are not available.

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Table 11-281. TEST #104 MTP Dual Port Ram Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2029	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The dual port RAM is not functioning correctly. Communication between the processor and MTP is lost. The system is not able to report environmental alarms, communicate with the Standby SPE, or reboot from tape, if necessary. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
	PASS	Dual port RAM is functioning. Communication exists between the 80286/386/RISC Processor circuit pack and the MTP.

MTP Sanity Handshake Test (#106)

This test is a nondestructive test. The MTP Sanity Handshake Test is simply a query from a maintenance process to the MTP. The MTP must reply for the test to pass.

Table 11-282. TEST #106 MTP Sanity Handshake Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1000	ABORT	System software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2000	ABORT	The response to the test request was not received within the allowable time period.

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Table 11-282. TEST #106 MTP Sanity Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033	ABORT	1. Internal system error.Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The MTP did not respond to the Sanity Handshake Query. 1. Re-enter command with the ‘‘long’’ option. 2. If the test continues to fail, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
	PASS	The MTP responded to the Sanity Handshake Query.

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MTP SAT Loop Around Test (#228)

This test is a nondestructive test. The test places the SAT channel of the MTP into a loop around mode, and it verifies the data integrity of the channel. Although the test is nondestructive, it causes loss of keyboard input from the PPN SAT.

Table 11-283. TEST #228 MTP SAT Loop Around Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1000	ABORT	System software resources required to run this test are not available.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2000	ABORT	The response to the test request was not received within the allowable time period.

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Table 11-283. TEST #228 MTP SAT Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2033 2034	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The SAT channel failed the Loop Back Test. The SAT is probably unusable for administration or maintenance. The EPN SAT, if available, or remote access can still be used. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
	PASS	The SAT channel passed the Loop Back Test. 1. If the PPN SAT is not usable, check the SAT itself, along with the cabling.

MTP Auxiliary Loop Around Test (#229)

This test is a nondestructive test. The test places the Auxiliary channel of the MTP into a loop around mode, and it verifies the data integrity of the channel. The Auxiliary channel is used as the CDR output port

Table 11-284. TEST #229 MTP Auxiliary Loop Around Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1000	ABORT	The system software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	The test has been disabled via administration. The **change system-parameters cdr** command needs to administer CDR. (Refer to the Implementation Manual for more information on administering this port.)

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Table 11-284. TEST #229 MTP Auxiliary Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period
2033		Internal system error.
2034		Port Busy. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2500	ABORT	The system software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1048	ABORT	An External Modem is administered to this port.
	FAIL	The Auxiliary channel failed the Loop Back Test. The AUX port is probably not sending any auxiliary data to the auxiliary collection device. 1. Repeat the command at one minute intervals for a maximum of five times. 2. If test continues to fail, replace the Processor circuit pack replaced at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)
	PASS	The Auxiliary channel passed the Loop Back Test. The auxiliary port is functioning correctly. 1. If no auxiliary data is being recorded, check the auxiliary collection device, and verify that it has been set up and connected correctly.

MTP External Modem Present Test (#230)

This test is a nondestructive test on the remote access line, and will run only if the channel is idle. The test validates the presence of an external modem with a firmware invoked AT command. The test will pass if the modem responds with "OK" to the AT command.

Table 11-285. TEST #230 External Modem Present Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1018	ABORT	The test has been disabled via administration. 1. To enable the test, issue the **change system-parameters maintenance** command, and set the Test Remote Access Port field to ‘‘y.’’ 2. Rerun the test.
1030	ABORT	This test is not run on the Standby SPE.
1131	ABORT	INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. 1. If INADS is communicating with the switch the INADS trunk is working. There is no need to run this test. 2. Or if required. Wait about ten minutes(untill the INADS session is terminated)and then re-enter the command.
1000 2033	ABORT	System software resources required to run this test are not available. Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-285. TEST #230 External Modem Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1049	ABORT	External Modem is not administered.
1050	ABORT	System could not determine if the testing of the INADS port is administered. 1. Enter the **change system-parameters maintenance** command, and verify the entry for the Test Remote Access Port field. 2. Repeat the command at one minute intervals a maximum of five times. 3. If the data on the Maintenance-Related System Parameters Form is correct, escalate the problem.
2000	ABORT	MTP did not respond to the test request. 1. Repeat test at one minute intervals a maximum of five times. 2. If only the MTP External Modem test is aborting, escalate the problem. 3. If all MTP tests are aborting, execute the **test processor a/b long** command in order to reset MTP, and examine the results of the MTP Reset Test (#101).

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Table 11-285. TEST #230 External Modem Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal System software Error 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	MTP reported test failure. The system is not able to reliably contact INADS with alarm data. However, the system continues to provide good service. The MTP did not receive an **OK** response after sending the **AT** command to the modem. 1. If test #103 failed, follow the external modem recommendations for that test failure. 2. If Test #103 passes: a. Check the RS232 cable connections from the DCE terminal on the switch to the DTE terminal on the modem. RTS and CTS signals are being communicated between the MTP DUART hardware and the modem hardware. Transmit and receive signals may not be communicated correctly. b. Check the modem administration using the **change system-parameters maintenance** command, especially changes from default parameters. c. Check the modem settings, especially changes from factory defaults. **DANGER:** *The fault may be on the Processor circuit pack. The circuit pack should be replaced at your convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)*

Continued on next page

Table 11-285. TEST #230 External Modem Present Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	MTP detected correct data from the external modem. The MTP received an **OK** response after sending the **AT** command to the modem. 1. If the system cannot call INADS, or if INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct. If an external modem is being used instead of the internal MTP modem, modem settings may be wrong. Approved external modems with factory default settings are expected to work if administered correctly using the **change system-parameters maintenance** command.

PR-MAINT (MainTenance/Tape Processor [286 systems] or Maintenance Processor [386 Systems])

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PR-MAINT	MIN[1]	test processor a/b sh/l	Maintenance/Tape Processor[2]

1 Alarms on the TAPE [G3iV1.1-286 system only], PROCR, and PR-MAINT maintenance objects (MOs) are indicated by the red LED on the Processor circuit pack.

2 The full Name of the MO in a G3iV1.1-286 system is Maintenance/Tape Processor. In a 386 system [G3iV2-386, G3sV2, or G3vsV2], the full Name of the MO is Maintenance Processor.

NOTE:
For systems with a TN790 Processor Circuit Pack use maintenance object PR-MAINT (MainTenance Processor TN790 RISC Systems).

The 80286 Processor and Maintenance/Tape Processor comprise the TN773 Processor circuit pack [G3iV1.1-286]. The 80386 Processor, Memory, and MainTenance Processor comprise the TN786B Processor circuit pack [386 systems]. This section applies to both the TN773 [G3iV1.1-286] and TN786B [386 systems] circuit packs.

The TN773 Processor circuit pack is comprised of the 80286 Processor (PROCR) and the Maintenance/Tape Processor (PR-MAINT). On the TN773 circuit pack, PR-MAINT is responsible for monitoring the sanity of the 80286 Processor, and it contains the hardware required for controlling the tape drive (see Figure 11-88).

The TN786B Processor circuit pack is comprised of the 80386 Processor (PROCR), the MainTenance Processor (PR-MAINT), and the Memory (MEMORY). On the TN786B circuit pack, PR-MAINT is responsible for monitoring the sanity of the 80386 Processor.

The major difference between the two circuit packs is that on the TN786B circuit pack, there is no tape for PR-MAINT to control and Memory is on the circuit pack. The rest of the functionality is the same. On both circuit packs, PR-MAINT contains the hardware required for controlling the environmental conditions. The Maintenance/Tape Processor provides the serial interfaces for the administration terminal and CDR ports. The Maintenance/Tape Processor also provides the communications interface to INADS for alarm reporting and remote maintenance capability.

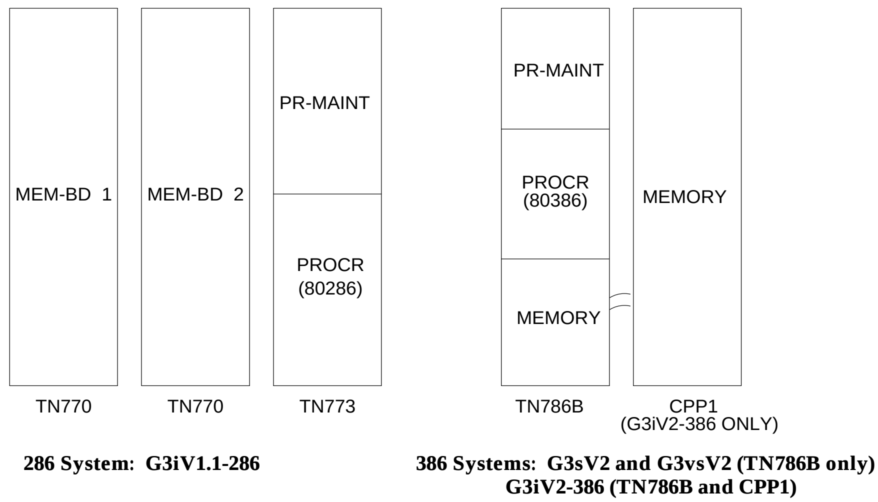

Figure 11-88. Configurations for 286 and 386 Systems

Hardware Error Log Entries and Test to Clear Values

Maintenance/Tape Processor Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0[2]	0	Any	Any	Any	test processor a/b sh r 1
1 (a)	Any	MTP Reset Test (#101)	MIN	ON	test processor a/b l r 3
257 (b)	Any	MTP Sanity Handshake Test (#106)			test processor a/b r 2
513 (c)	Any	MTP Analog Loop Around Test (#103)	MIN	ON	test processor a/b r 8
769 (d)	Any	MTP Dual Port Ram Test (#104)	MIN	ON	test processor a/b l r 3
1025 (e)	Any	MTP Outpulse Relay Test (#102)	MIN	OFF	test processor a/b r 5
1537 (f)	Any	MTP Manager I Loop Around Test (#228)	MIN	ON	test processor a/b r 3
1793 (g)	Any	MTP Aux Loop Around Test (#229)	MIN	ON	test processor a/b r 3

1 **[G3iV1.1-286 only]:** Software does not accept the repeat option. You must manually repeat the command with the "long" option the designated number of times. **[For all systems]:** You must manually repeat the command with the "long" option the designated number of times from the administration terminal or from a remote administration terminal because the Sanity Timer Test (#83) logs you off.

2 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The MTP Reset Test (#101) has failed.

b. The MTP Sanity Handshake Test (#106) has failed.

c. The MTP Analog Loop Around Test (#103) has failed.

d. The MTP Dual Port Ram Test (#104) has failed. An error of 769 with an aux data of 5 indicates a hardware problem and testing will not clear it. The circuit pack should be replaced.

e. The MTP Outpulse Relay Test (#102) has failed.

f. The MTP Manager I Loop Around Test (#228) has failed.

g. The MTP Aux Loop Around Test (#229) has failed.

NOTE:
Refer to the FAIL section of each test that fails for further instructions.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *MTP Reset Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Software Initiated Interrupt Test (#77) (a)	X	X	ND
Processor ROM Checksum Test (#80) (a)	X	X	ND
Processor Non-maskable Interrupt Test (#82) (a)	X	X	ND
Processor Sanity Timer Test (#83) (a)		X	D
MTP Reset Test (#101)		X	D
MTP Dual Port Ram Test (#104)		X	D
MTP Sanity Handshake Test (#106)	X	X	ND
MAP Manager I Loop Around Test (#228)	X	X	ND
MTP Analog Loop Around Test (#103)	X	X	ND
MTP Outpulse Relay Test (#102)	X	X	ND
MTP Aux Loop Around Test (#229)	X	X	ND
Read All Memory Test (#85)(b)		X	ND
Memory Error Detection Test (#87)(b)	X	X	ND
Text Checksum Test (#86)(b)		X	ND
Memory Functional Test (#332) (b)(c)		X	D
Memory Board Check Test (#631) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to PROCR (8028/803866 Processor Circuit Pack) Maintenance documentation for a description of these tests.

b. Refer to MEMORY [386 systems only] Maintenance documentation for a description of these tests.

MTP Reset Test (#101)

This test is destructive. The test resets the Maintenance/Tape Processor. The destructive nature of this test causes the following:

- Administration terminal to log off
- CDR port to terminate data transmission
- Any current tape access to terminate and also to tear down any remote access INADS connection

Table 11-286. TEST #101 MTP Reset Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
10102	ABORT	System software resources required to run this test are not available.
10104	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-286. TEST #101 MTP Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10105	FAIL	The MTP did not respond to being reset. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*

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Table 11-286. TEST #101 MTP Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10106	FAIL	The Maintenance/Tape Processor was reset, but it responded with a NOT PASS status, indicating that it did not pass initialization correctly. The MTP is not functioning correctly. The system should continue to function, but it will not have the ability to save translation to tape, or to read tape if the system needs to be rebooted. Environmental monitoring is lost, as is communication with the Standby Processor. 1. Repeat the command at one minute intervals a maximum of five times. 2. If test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The Maintenance/Tape Processor was reset, and it passed initialization correctly. The other MTP tests should be examined to verify that the MTP is functioning correctly. 1. Enter **test processor a/b** and verify that the MTP is functioning correctly.

MTP Outpulse Relay Test (#102)

This test is a nondestructive test. The test validates the correct operation of the remote access CO trunk used by INADS. The MTP first goes off-hook, then on-hook on this trunk. If the loop current is detected, the test passes. This test is not allowed if the remote access line is in use.

Table 11-287. TEST #102 MTP Outpulse Relay Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1018	ABORT	The test has been disabled via administration. 1. To enable the test, issue the **change system-parameters maintenance** command, and set the test remote access port field to "y." (If you have an INADS line, set the field to "y." If you are testing the Standby PR-MAINT, a **refresh spe-standby** command must be successfully executed before you proceed to Step 2. 2. Rerun the test.
1131	ABORT	INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. 1. Wait about ten minutes and then re-enter the command.
10201	ABORT	System software resources required to run this test are not available.
10202	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-287. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10203	ABORT	MTP did not respond to the test request. 1. Repeat the test at one minute intervals a maximum of five times. 2. If all MTP tests are aborting, execute the **test processor a/b long** command in order to reset MTP and to examine the results of the MTP Reset Test (#101). 3. Replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) ⚠ **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.* 4. If only the MTP outpulse relay test is aborting, escalate the problem.

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Table 11-287. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10204	FAIL	MTP reported test failure. No loop current detected. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, examine the INADS trunk for connectivity, and manually check for loop current. 3. If there is no INADS trunk, this test should be disabled. To disable the test, issue the **change system-parameters maintenance** command, and change the Test Remote Access Port field to "n." If this test is failing on the Standby SPE, issue the **refresh spe-standby** command, and rerun the test. 4. If the INADS trunk checks out okay, but the test still fails, check the backplane connector wiring. 5. If the backplane wiring checks out okay, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, 'Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	MTP detected a loop current on the remote access port. 1. If the system cannot call INADS, or INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct.

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Table 11-287. TEST #102 MTP Outpulse Relay Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10205	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
10206	ABORT	System could not determine if the testing of the INADS port is administered. 1. Enter the **change system-parameters maintenance** command. Verify that the "Test Remote Access Port?" field is set to "y." 2. Repeat the command at one minute intervals a maximum of five times. 3. If the data on the Maintenance-Related System Parameters Form is correct, escalate the problem.
10208	ABORT	The remote access port is busy. INADS is probably dialed into the switch. 1. If INADS is dialed in, the INADS trunk is working. There is no need to run the test.

MTP Analog Loop Around Test (#103)

This test is a nondestructive test. The test does an on-board loop around by using the MTPINADS channel. Test data is sent through the on-board modem out toward the INADS trunk. The data is looped around before the actual trunk, and it comes back into the on-board modem. The data is then verified for integrity.

NOTE:
The test does not send any data onto the INADS trunk. However, in order to pass, the test does require the trunk to be present.

Table 11-288. TEST #103 MTP Analog Loop Around Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	(Refer to STBY-SPE Maintenance documentation for a description of these error codes.)
1018	ABORT	The test has been disabled via administration. 1. To enable the test, issue the **change system-parameters maintenance** command, and set the Test Remote Access Port field to 'y'. If you are testing the Standby PR-MAINT, a **refresh spe-standby** command must be successfully executed before you can proceed to Step 2. 2. Rerun the test.
1131	ABORT	The INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. 1. Wait about 10 minutes and then re-enter the command.

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Table 11-288. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10301	ABORT	System software resources required to run this test are not available.
10302 10309	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
10303 10310	ABORT	MTP did not respond to the test request. 1. Repeat test at one minute intervals a maximum of five times. 2. If only the MTP Analog Loop Around Test is aborting, escalate the problem. 3. If all MTP tests are aborting, execute the **test processor a/b long** command in order to reset MTP, and examine the results of the MTP Reset Test (#101).
10305	ABORT	Internal System software Error 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
10306	ABORT	System could not determine if the testing of the INADS port is administered. 1. Enter the **change system-parameters maintenance** command, and verify the entry for the Test Remote Access Port field. 2. Repeat the command at one minute intervals a maximum of five times. 3. If the data on the Maintenance-Related System Parameters Form is correct, escalate the problem.
10308	ABORT	The remote access port is busy. INADS is probably dialed into the switch. 1. Wait until INADS session is terminated and then re-enter the command.

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Table 11-288. TEST #103 MTP Analog Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
10311	ABORT	Test #102 MTP Outpulse Relay Test failed. 1. Refer to Error Code 10204 of the MTP Outpulse Relay Test (#102) for directions.
10304	FAIL	MTP reported test failure. The system is not able to reliably contact INADS with alarm data. However, the system continues to provide good service. 1. If MTP Outpulse Relay Test (#102) is also failing, check for the presence of the INADS trunk, and resolve any INADS trunk problems. 2. If Test #102 passes, the fault is on the Processor circuit pack. The circuit pack should be replaced at your convenience. (Refer to Chapter 8, 'Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	MTP detected correct data through the loop back connection. 1. If the system cannot call INADS, or if INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct.

MTP Dual Port Ram Test (#104)

This test is destructive.

The test terminates any PPN Manager I session, and it is a coordinated test of the MTP dual port ram (DPR). The DPR is a section of memory that is shared by the MTP and by the 80286/386 Processor circuit pack. Control messages and data are passed through the DPR. The test forces both sides to read and write the DPR simultaneously in alternate locations.

The DPR test causes the PPN Manager I to log off before the test result is displayed. The test result is determined according to the terminal from which the test is run. If the test is run from the PPN Manager I terminal, system technician should log back in and examine the Error Log for an error against PR-MAINT, with Error Type 769, no Aux Data. This error entry indicates that the MTPDPR Test failed and that the Processor circuit pack should be replaced. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.)

WARNING:

If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.

If the test is being run from a terminal other than the PPN Manager I (for example, EPN Manager I, remote access, etc.), the test results are displayed on the screen.

NOTE:

A dial-up (through the INADS port) does not display the results discussed in the previous paragraph. However, a dial-up through data channels does display these results.

Table 11-289. TEST #104 MTP Dual Port Ram Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	(Refer to STBY-SPE Maintenance documentation for a description of these error codes.)
1000	ABORT	System software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1030	ABORT	The component on which the test was to be run is on the Standby SPE. This test may be run on this component only when it resides on the Active SPE. 1. For a recommended maintenance procedure, refer to ABORT Error Code 1030 in STBY-SPE Maintenance documentation.
2000	ABORT	Response to the test request was not received within the allowable time period.
2028	ABORT	System software resources required to run this test are not available.
2029	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-289. TEST #104 MTP Dual Port Ram Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The dual port RAM is not functioning correctly. Communication between the processor and MTP is lost. The system is not able to report environmental alarms, communicate with the Standby SPE, or reboot from tape, if necessary. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	Dual port RAM is functioning. Communication exists between the 80286/386 Processor circuit pack and the MTP.

MTP Sanity Handshake Test (#106)

This test is a nondestructive test. The MTP Sanity Handshake Test is simply a query from a maintenance process to the MTP. The MTP must reply for the test to pass.

Table 11-290. TEST #106 MTP Sanity Handshake Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1000	ABORT	System software resources required to run this test are not available.
2033	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-290. TEST #106 MTP Sanity Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The MTP did not respond to the Sanity Handshake Query. 1. Re-enter command with the "long" option. 2. If the test continues to fail, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack [386 systems] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The MTP responded to the Sanity Handshake Query.

MTP Manager I Loop Around Test (#228)

This test is a nondestructive test. The test places the Manager I channel of the MTP into a loop around mode, and it verifies the data integrity of the channel. Although the test is nondestructive, it causes loss of keyboard input from the PPN Manager I.

Table 11-291. TEST #228 MTP Manager I Loop Around Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1000	ABORT	System software resources required to run this test are not available.
2000	ABORT	The response to the test request was not received within the allowable time period.
2033 2034	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-291. TEST #228 MTP Manager I Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Manager I channel failed the Loop Back Test. The Manager I is probably unusable for administration or maintenance. The EPN Manager I, if available, or remote access can still be used. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to fail, replace the Processor circuit pack at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The Manager I channel passed the Loop Back Test. 1. If the PPN Manager I is not usable, check the Manager I itself, along with the cabling.

MTP Auxiliary Loop Around Test (#229)

This test is a nondestructive test. The test places the Auxiliary channel of the MTP into a loop around mode, and it verifies the data integrity of the channel. The Auxiliary channel is used as the CDR output port.

Table 11-292. TEST #229 MTP Auxiliary Loop Around Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1000	ABORT	The system software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1018	ABORT	The test has been disabled via administration. The **change system-parameters cdr** command needs to administer CDR. (Refer to the Implementation Manual for more information on administering this port.)
2000	ABORT	Response to the test request was not received within the allowable time period.
2033 2034	ABORT	Internal system error. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
22902 22903	ABORT	The system software resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-292. TEST #229 MTP Auxiliary Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Auxiliary channel failed the Loop Back Test. The AUX port is probably not sending any auxiliary data to the auxiliary collection device. 1. Repeat the command at one minute intervals for a maximum of five times. 2. If test continues to fail, replace the Processor circuit pack replaced at your earliest convenience. (Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for information on how to replace a circuit pack in the control carrier.) **WARNING:** *If the TN786B circuit pack must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The Auxiliary channel passed the Loop Back Test. The auxiliary port is functioning correctly. 1. If no auxiliary data is being recorded, check the auxiliary collection device, and verify that it has been set up and connected correctly.

PR-MEM (TN790 RISC Memory)

MO Name As It Appears In Alarm Log	Alarm Level	Initial System Technician Command To Run	Full Name of MO
PR-MEM[1]	MAJOR	test memory a/b lo c	TN790 RISC Memory
PR-MEM[1]	MINOR	test memory a/b sh c	TN790 RISC Memory

1 The maintenance object is "PR-MEM" because all of the Memory used by the RISC Processor is on the TN790 Processor circuit pack.

NOTE:
For G3iV1.1-286, G3iV2-386, G3sV2, G3vsV2 systems refer maintenance objects MEM-BD (Memory) and MEMORY for 386 systems.

The TN790 RISC Memory contains the DEFINITY software and firmware. The Processor circuit pack is the most critical component in the system.

For testing purposes, the circuit pack is logically separated into PR-MAINT, PROCR, and PR-MEM. This means that a memory problem requires that the Processor be replaced. These systems contain two types of memory: Flash ROM and DRAM. Flash ROM is memory that contains the boot image, part of the low-level maintenance firmware, PI firmware, and PACCON firmware. This type of memory is not erased during circuit pack resets. It can be reprogrammed via the **upgrade software** command or a Reset System 4/5 using a software memory card.

One section of the Flash ROM (BOOTPROM) containing the system initialization functions and the low-level diagnostic programs is programmed at the factory and is not reprogrammed by the **upgrade software** command. DRAM is used for software data storage, and it changes constantly. Both types of memory are present on the Processor circuit pack. The diagnostics run appropriate tests on both memories.

DRAM is replaceable and installed in 3 Single In-line Memory Module (SIMM) sockets on this circuit pack. Replacement of these SIMMs is described in "Install the SIMM on the TN790 Processor Circuit Pack" in Chapter 5, "Routine Maintenance Procedures".

For all system activity, the Processor must be able to access the Memory. If the Processor cannot do this, the system goes into SPE-down mode. In SPE-down mode, fatal Memory errors may show up as Processor errors. This merely indicates that the Processor and the Memory are very closely linked as a matter of course.

If the initialization diagnostics fail, refer to the "Procedure for SPE-Down Mode" section in Chapter 4, "Initialization and Recovery".

Hardware Error Log Entries and Test to Clear Values

Memory Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test memory a/b l r 1
1	Any	Flash Memory ChecksumTest (#86)	MAJOR	ON	test memory a/b l r 5
3(a)	Any	Flash Memory ChecksumTest (#86)	MAJOR	ON	test memory a/b l r 5
1025	Any	Memory Parity Error DetectionTest (#87)	MINOR	ON	test memory a/b r 3
1281	Any	Memory Burst Read Test (#908)	MAJOR	ON	test memory a/b l r 2
1793	Any(b)(c)	Read All Memory (#85)	MAJOR	ON	test memory a/b l r 1
2049(d)	Any(b)(c)	Memory Functional Test (#332)	MAJOR	ON	test memory a/b l r 1

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error (3) indicates that a software patch has been applied and either the software patch is bad or was installed incorrectly.

1.Back out the software patch and run the **test memory UUCS long** command to verify that the problem has been cleared.

2.If the PBX system is equipped with High Reliability or Critical Reliability option (i.e. with duplicated SPEs), and this error occurs, a SPE interchange will occur if the health of the standby SPE permits the interchange.

b. The following Aux Data indicate SIMM Failures

1.SIMM A

2.SIMM B

3.SIMM A & SIMM B

4.SIMM C

5.SIMM A & SIMM C

6.SIMM B & SIMM C

7.SIMM A, SIMM B, & SIMM C

c. Aux Data of 100 is an LMM Flash Checksum initialization failure.

d. There are Functional Memory Test errors against the Processor circuit pack. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a **reset system 4** command or a **reset system 5** command.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate errors in the order in which they are presented in the table that follows when you are inspecting errors in the system. By clearing error codes associated with the *Read All Memory Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor CacheTest (#895)(a)		X	ND
Processor Cache Audit (#896)(a)	X	X	ND
Processor Bus Timeout Exception Test (#82)(a)	X	X	ND
Processor BOOTPROM Checksum Test (#897)(a)	X	X	ND
Processor Write Buffer Test (#900)(a)	X	X	ND
Memory Burst Read Test (#908)	X	X	ND
Read All Memory Test (#85)		X	ND
Memory Parity Error Detection Test (#87)	X	X	ND
Flash Memory Checksum Test (#86)		X	ND
Memory Functional Test (#332) (b)		X	D
MTP Outpulse Relay Test (#102) (c)	X	X	ND
MTP External Modem Present Test (#230) (c)	X	X	ND
MTP Analog Loop Around Test (#103) (c)	X	X	ND
MTP Sanity Handshake Test (#106	X	X	ND
MTP SAT Loop Around Test (#228) (c)	X	X	ND
MTP Aux Loop Around Test (#229) (c)	X	X	ND
MTP Reset Test (#101) (c)		X	D
MTP Dual Port Ram Test (#104) (c)		X	D

1 D = Destructive; ND = Nondestructive

For example, you may also clear errors generated from other tests in the testing sequence.

a. Refer to PROCR (TN790 RISC Processor) Maintenance documentation for a description of these tests .

b. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a **reset system 4** command or a **reset system 5** command.

c. Refer to PR-MAINT (MainTenance Processor) Maintenance documentation for a description of these tests.

Read All Memory Test (#85)

This test is a nondestructive test. The test reads every memory location in memory. A failure of this test indicates a DRAM failure in the Processor circuit pack. DRAM is replaceable and installed in 3 Single Inline Memory Module (SIMM) sockets on this circuit pack. Replacement of these SIMMs is described in the "Circuit Pack Replacement Procedure" section.

Table 11-293. TEST #85 Read All Memory Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.

Continued on next page

Table 11-293. TEST #85 Read All Memory Test ***— Continued — Continued***

Error Code	Test Result	Description/ Recommendation
1 - 7	FAIL	If the system can still provide service, this indicates that the Processor circuit pack has a problem with memory or the RISC processor, but can still function. At the customers convenience run the destructive "**reset system 4**" command to boot the system and write to all of the memory locations. This will clear transient parity errors and test for permanent parity errors. This complete memory testing during initialization will cause "SPE DOWN" if a parity error is detected and the PROCR circuit pack should be replaced. If parity errors reoccur within several weeks, record the error code information indicating which memory modules failed, together with the extended interval between failures. After recording the information and at the customers convenience replace the PROCR circuit pack and escalate the problem.
	PASS	The Memory is healthy.

Flash Memory Checksum Test (#86)

This test is a nondestructive test. The test computes the checksum of the DEFINITY Generic 3 software and firmware loaded from the Software Memory Card (SOFTWARE MEM-CARD). A failure of this test indicates corruption of the Flash Memory. However, this failure does NOT always indicate a hardware problem. **DO NOT REPLACE** the Processor circuit pack when this is the only error. A system restart via the **reset system 4** command starting with inserting the Software Memory Card for this system followed by re-inserting the Translation Memory Card memory card should be implemented at the customer's earliest convenience.

In a High or Critical Reliability system, an **upgrade software** command can be used with the Software Memory Card for the system followed by re-inserting the Translation Memory Cards as directed by this upgrade procedure. This command performs the same operation as the **reset system 4** command but is much less service-disruptive.

Table 11-294. TEST #86 Text Checksum Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowabletime period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

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Table 11-294. TEST #86 Text Checksum Test **— *Continued***

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal System Error. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1 - 7	FAIL	The system may or may not continue to operate correctly. The system may fail later when some action requires access to the corrupted area of the Text. 1. The Flash ROM should be reprogrammed via the **upgrade software** command. The memory card should contain the same vintage software that is currently in the system. Refer to the "Software Upgrade" section in this manual. 2. If the test continues to fail, replace the TN790 Processor circuit pack and repeat step 1. 3. If the test continues to fail, escalate the problem.
	PASS	The checksum is correct.

Memory Parity Error Detection Test (#87)

This test is a nondestructive test. The test is run on a few reserved locations in memory. A failure of this test indicates a failure on the Processor circuit pack.

This test determines if the parity circuitry is working. Accordingly, the test determines if parity errors can be detected. The parity circuitry is used to detect DRAM memory failures.

Table 11-295. TEST #87 Memory Parity Error Detection Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1 - 7	FAIL	The parity detection circuitry is not working correctly. If the system can still provide service, this indicates that the Processor circuit pack has a problem but can still function. 1. The TN790 Processor circuit pack should be replaced. The failure is identifying the PROCR as being bad and only the PROCR circuit pack needs to be replaced. 2. If the test still fails, escalate the problem.
	PASS	The parity detection circuitry is working.

Memory Functional Test (#332)

This test is destructive.

This test ensures that every DRAM memory location can be accessed and changed independently. Running this test wipes out all data in DRAM memory. This test is performed during a **reset system 4** or **reset system 5**. If the test fails during a **reset system** command, refer to the "Procedure for SPE-Down Mode" in the Chapter 4, "Initialization and Recovery" for the recommended maintenance strategy. This test can be run as a long demand test on the standby SPE.

Table 11-296. TEST #332 Memory Functional Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1000	ABORT	System resources required to run this test are not available. 1. Repeat the command at one minute intervals a maximum of three times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

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Table 11-296. TEST #332 Memory Functional Test **— *Continued***

Error Code	Test Result	Description/ Recommendation
1 - 7	FAIL	The Standby SPE Processor circuit pack is defective. 1. Repeat the command at one minute intervals a maximum of five times. 2. If the test still shows a failure, the Processor circuit pack should be replaced. 3. If the test continues to fail, escalate the problem.
	PASS	The Standby SPE Processor circuit pack is healthy.

Memory Burst Read Test (#908)

This test verifies that the Memory Burst Read function works properly on the Processor circuit pack.

Table 11-297. TEST #908 Memory Burst Read Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1022 1335 2500	ABORT	Internal System Error. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
1 - 7	FAIL	The Burst Read circuit is not functioning properly. 1. If the test fails, replace the Processor and retry the test. 2. If the test continues to fail after replacing the Processor circuit pack, follow normal escalation procedures.
	PASS	The Burst Read portion of the Processor circuit pack is operating correctly.

PRI-CDR/SEC-CDR (PRI-CDR Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PRI-CDR/SEC-CDR	MINOR	test cdr-link primary/secondary l	CDR Link
PRI-CDR/SEC-CDR	WARNING	test cdr-link primary/secondary	CDR Link

The CDR feature records detailed call information on all incoming and outgoing calls on specified trunk groups and sends this information to an CDR output device. The two physical links can be administered for connecting external CDR output devices to the system. They are identified as the primary CDR (PRI-CDR) link and the secondary CDR (SEC-CDR) link. The CDR link can be administered to a data extension or the EIA port on the system TN773 Processor circuit pack which provides a standard EIA 232C interface. The external CDR output devices are:

- 94A Local Storage Unit (LSU)
- TELESEER CDR Unit
- AT&T Call Accounting System (CAS)
- AT&T Call Detail Recording Unit (CDRU)
- Printer
- Host computer
- Personal computer (PC)
- Customer-provided equipment

Refer to *DEFINITY Communications System Generic 3 Feature Description*, 555-230-204 or *DEFINITY Communications System Generic 1 and Generic 3 Feature Description,* 555-230-201, for details of the CDR feature.

CDR Link Maintenance provides a strategy for maintaining the link between the system and an external CDR output device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. CDR Link Maintenance uses a try-and-wait mechanism for maintaining the CDR link. If the CDR link is torn down due to an error, CDR Link Maintenance intends to bring the CDR link up. If the Link Setup trial fails, CDR Link Maintenance waits 30 seconds before the next retry. If the number of retries reaches the value of a threshold (two), a Minor alarm is raised for service attention.

The following physical configurations are supported for the CDR link:

- From the EIA port of Processor circuit pack to an CDR output device through the standard EIA 232C interface.
- From a data channel on TN777 Network Control circuit pack to a data extension where the CDR output device connects via the standard EIA 232C interface.

  The data extension can be a PDM, MPDM, DTDM, or ADU. The PDM, MPDM, and DTDM connect to a Digital Line Port of TN754 or TN754B Digital Line circuit pack; ADU connects to a Data Line Port of TN726 Data Link circuit pack.

NOTE:
In duplicated systems it is possible for a failure on one of the processor circuit packs to bring down the CDR link even if it is the standby processor. This problem can not be resolved by interchanging processors because the CDR ports on each of the processor circuit packs are connected via WIRE-OR.

CDR Link Maintenance does not cover the maintenance of the elements composing the CDR physical link, which are as follows:

- External CDR output device
- EIA port on Processor circuit pack
- Data Module (PDM/MPDM/DTDM) and Digital Line Port of TN754 or TN754B Digital Line circuit pack
- ADU and Data Line Port of TN726 Data Link circuit pack
- Data Channels on TN777 Network Control circuit pack

If CDR Link Maintenance cannot restore the CDR link, then the maintenance tests of these individual components of the CDR link must be executed to diagnose faults.

Procedures for Restoring the CDR Link

1. Get the status of CDR links.

   Enter **status cdr-link** command and make sure that the CDR links are not busied out for maintenance. If the link is down, then continue to the next step.

2. Where does the CDR link connect to?

   Enter **display system feature** and find out the destinations of CDR links. Continue to the next step.

3. Is the destination an extension or the EIA port?

If the destination is an extension number, then enter the **status data extension** command and verify whether the data extension is in the in-service/idle state. If the data extension is NOT available, then look for the extension number in Alt Name field of Hardware Error Log and refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for resolutions.

If the destination is "eia," then look for PR-MAINT errors in the Hardware Error Log. If present, refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation.

4. Is a data channel on TN777 Network Control circuit pack in the in-service/idle state?

   Enter **list data** command and find out the extension numbers of data channels on TN777 Network Control circuit pack. Enter **status data extension** command and make sure that at least one data channel is in the in-service/idle state. If no data channel is available, then look for DATA-CHL/DATA-CON/DATA-BD errors in the Hardware Error Log. If present, refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation; if the problem persists, escalate the error.

5. Is the external CDR output device available?

   Make sure that the CDR output device is on-line and ready for service. Check the physical connectivity between Data Module and the CDR output device or between the EIA port on backplane of the switch and the CDR output device.

It is recommended to busy out the CDR link before executing maintenance tests over the CDR link. If the CDR link is busied out, then all CDR link maintenance actions are deactivated. The interference to tests of other MO is off.

Hardware Error Log Entries and Test to Clear Values

CDR Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test cdr-link primary|secondary sh
18 (a)	0	busy out cdr	WARNING	OFF	release cdr-link primary|secondary
		primary|secondary			
25 (b)	0 3 to 6 9 99 255	Link Retry Test (#215)	MINOR/ WARNING[2]	OFF	test cdr-link primary|secondary l
513 (c)	0 3 to 6 9				test cdr-link primary|secondary
1025 (d)					
1281 (e)					

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. System Technician has busied out the CDR link to out-of-service state. The CDR link is torn down.

b. Link Retry Test (#215) fails. The Aux Data field contains either the Channel ID of Data Channels on the TN777 circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04, and 9 for EIA port) or an Error Code of 99 indicating that no data channels are available for setting up the link, or an Error Type of 255 indicating an internal system error. Refer to the preceding "Procedures for Restoring the CDR Link" for resolution.

c. The CDR physical link is down due to the following causes: cable to the CDR output device is disconnected; CDR output device is powered off, the data extension where the CDR output device connects to has been busied out or there is a scheduled daily interchange. The Aux Data field contains the Channel ID of Data Channels on the TN777 circuit pack (that is, 3 for Channel 01, 4 for Channel 02, 5 for Channel 03, 6 for Channel 04, and 9 for EIA port). Check the connectivity of wire and cable among wall jacket, data module, and the CDR output device. Enter **status data extension** and verify that the data extension of the CDR output device is in the in-service/idle state. If the data extension is not available, then refer to the preceding "Procedures for Restoring the CDR Link" for resolution. Issue the **display system-parameters-maintenance** command to see the start time of daily maintenance. If the error occurs and is resolved during the interval of daily maintenance, then the error can be ignored.

d. This error indicates that the CDR output device is in an off-line state, for example, paper jam or paper out for a printer device. The CDR link is torn down. Check the CDR output device and act promptly to put it back to on-line state. Enter **test cdr-link primary|secondary** command to set up the CDR link.

e. Software detects an overflow of CDR records generated in the switch due to the heavy trunk traffic and low speed CDR output device. If both primary and secondary links are ON, the secondary link is torn down temporarily for two minutes to speed up the output process to the primary link. No action is necessary for this error type.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Link Retry Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down Test (#213)		X	D
Link Retry Test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is destructive.

This test disconnects the existing link between the system and the external CDR output device. If the link has been disconnected already, this test just returns PASS. All resources allocated for an CDR link are released after this test.

Table 11-298. TEST #213 Link Tear Down Test

Error Code	Test Result	Description/ Recommendation
40	ABORT	Internal System Error.
50	ABORT	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1010	ABORT	The CDR link has been busied out to out-of-service. 1. Enter the **release cdr-link primary|secondary** command to release the CDR link from busyout state. 2. Retry the **test cdr-link primary|secondary long** command to execute the test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The CDR link is torn down.

Link Retry Test (#215)

This test sends a message to the CDR software process to make a data call to the extension where the CDR output device connects to or opens the EIA port to the CDR output device. If the CDR link is already up, this test is passed without making any data call or opening the EIA port.

Table 11-299. TEST #215 Link Retry Test

Error Code	Test Result	Description/ Recommendation
10	ABORT	Internal System Error.
20	ABORT	Internal System Error. Internal error in Maintenance Action Process (MAP). MAP returns an error back to maintenance script (HMM). Timer expires while waiting for the reply from MAP. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
30	ABORT	Internal System Error. 1. Refer to "Procedures for Restoring the CDR Link" for instructions.
1010	ABORT	The CDR link has been busied out to out-of-service. 1. Enter **release cdr-link primary|secondary** command to release the CDR link from busyout state. 2. Retry **test cdr-link primary|secondary long** command to execute the test.
	FAIL	The CDR link CANNOT be established. 1. Refer to the "Procedures for Restoring the CDR Link" for instructions.
	PASS	The CDR link is up.

PROC-SAN (Process Sanity Audits)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PROC-SAN	none	none	Process Sanity Audits

The Process Sanity Audits MO is responsible for monitoring the sanity of software processes in the system. If the Process Sanity Audits MO detects that a process has gone insane (does not respond to a sanity message within an allotted time period), the process is restarted. If the Process Sanity Audits MO detects that multiple processes (or a single key process) do not respond to sanity messages within an allotted time period, a system recovery action is initiated.

The Process Sanity Audits MO has no alarms and no tests. Certain errors are logged to the Hardware Error Log for information purposes only.

Hardware Error Log Entries and Test to Clear Values

Process Sanity Audits Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	none
10 (a)	0	none	none	none	none
204 (a)	any	none	none	none	none

1 Look for other errors of the same type and deal with them accordingly.

a. These errors indicate that a system recovery action has been taken because one or more software processes failed to respond to a sanity audit in a timely fashion. As a result of the recovery action, the system may have temporarily suspended service for a period of time surrounding the error. If these errors persist, escalate the problem immediately.

PROCR (TN790 RISC Processor Circuit Pack)

MO Name As It Appears In Alarm Log	Alarm Level	Initial System Technician Command To Run	Full Name of MO
PROCR	MAJOR	test processor a/b lo r/c	TN790 RISC Processor Circuit Pack
PROCR	MINOR	test processor a/b sh r/c	TN790 RISC Processor Circuit Pack

NOTE:
For systems with a TN773 [G3iV1.1-286] or a TN786B Processor circuit pack, see maintenance object PROCR (Processor Circuit Pack) in this section.

NOTE:
Alarms on the PR-MEM, PROCR and PR-MAINT maintenance objects (MOs) are indicated by the red LED on the Processor circuit pack.

This section applies to the TN790 [G3iV5, G3sV5, or G3vsV5]. The TN790 has a RISC processor (PROCR) that uses on-board Flash ROM and DRAM memory (PR-MEM). This circuit pack also contains the MainTenance Processor (PR-MAINT).

The RISC Processor circuit pack portion is responsible for the execution of the DEFINITY Generic 3 software package. This includes all of the call processing, maintenance, and administration functions. The RISC Processor circuit pack is the most critical component to the correct operation of the system.

The PR-MAINT (MainTenance Processor for RISC systems) is responsible for monitoring the sanity of the RISC Processor circuit pack as well as the environmental conditions. The PR-MAINT provides the serial interfaces for the SAT and for the Digital Communications Equipment (DCE) ports. The PR-MAINT also provides the communications interface to INADS for alarm reporting and remote maintenance capability.

In High and Critical Reliability systems, the PR-MAINT is part of the communications path between the Active Processor Element and the Standby Processor Element.

Hardware Error Log Entries and Test to Clear Values

RISC Processor Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0[2]	0	Any	Any	Any	test processor a/b r 1
1(a)	Any	BOOTPROM Checksum Test (#80)	MAJOR	ON	test processor a/b r 5
513		Processor Write Buffer Test (#900)	MAJOR	ON	test processor a/b r 1
1025(b)	Any	Processor Cache Audit (#896)	MINOR	ON	test processor a/b r 2
1281	Any	Processor Cache Test(#895)	MAJOR	ON	test processor a/b r 1
1793(c)		Processor Bus Timeout Exception Test (#82)	MAJOR	ON	test processor a/b r 2
2049(d)(e)	Any	Processor Sanity Timer Test	MINOR	ON	test processor a/b l c
2305(d)(f)	Any	Address Matcher Test	none	ON	test processor a/b l c

1 The MTP Reset Test (#101) logs you off. The MTP Dual Port Ram Test (#104) can also log you off.

2 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The BOOTPROM Checksum Test (#80) failed. Refer to the FAIL condition of this test for further action.

b. A parity error was detected in the processor’s data cache or instruction cache. Aux Data indicates the difference in the number of parity errors since the last report.

c. The Processor Bus Timeout Test (#82) failed. Refer to the FAIL condition of this test for further action.

d. Aux Data of 100 is an LMM initialization failure.

e. The Processor Sanity Timer Test failed during a reset level 4 or 5 initialization. reset system 4 at the customers convenience and if the alarm occurs again, replace the processor circuit pack. The system will run with this failure, but it is not protected if the system software has a sanity problem. The test processor a/b long clear command will clear this alarm, but the sanity timer is only tested during initialization so the alarm will occur again and the system is not protected against insane software.

f. The Address Matcher Test failed during a reset level 4 or 5 initialization. This failure is not alarmed because the address matcher is only used for high level debugging. The processor circuit pack should be replaced if the Address Matcher is needed for troubleshooting.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *Processor Bus Timeout Exception Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Cache Test (#895)		X	ND
Processor Cache Audit (#896)	X	X	ND
Processor Bus Timeout Exception Test (#82)	X	X	ND
Processor BOOTPROM Checksum Test (#80)	X	X	ND
Processor Write Buffer Test (#900)	X	X	ND
Memory Burst Read Test (#908)(a)	X	X	ND
Read All Memory Test (#85)(a)		X	ND
Memory Parity Error Detection Test (#87)(a)	X	X	ND
Flash Memory Checksum Test (#86)(a)		X	ND
Memory Functional Test (#332) (a) (b)		X	D
MTP Outpulse Relay Test (#102) (c)	X	X	ND
MTP External Modem Present Test (#230) (c)	X	X	ND
MTP Analog Loop Around Test (#103) (c)	X	X	ND
MTP Sanity Handshake Test (#106) (c)	X	X	ND
MTP SAT Loop Around Test (#228) (c)	X	X	ND

Continued on next page

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
MTP Aux Loop Around Test (#229) (c)	X	X	ND
MTP Reset Test (#101) (c)		X	D
MTP Dual Port Ram Test (#104) (c)		X	D

1 D = Destructive; ND = Nondestructive

a. Refer to PR-MEM Maintenance documentation for a description of these tests.

b. There are Functional Memory Test errors against the Processor circuit pack. This test is run only on the Standby SPE in a High or Critical Reliability system. On other systems or on the Active SPE, the test is run only via a reset system 4 command or a reset system 5 command.

c. Refer to PR-MAINT (MainTenance Processor) Maintenance documentation for a description of these tests.

Processor BOOTPROM Checksum Test (#80)

This test is a nondestructive test. This test computes the checksum of the Processor's bootstrap BOOTPROM and compares it to a predetermined value stored within the BOOTPROM. A failure of this test indicates the BOOTPROM is corrupt.

Table 11-300. TEST #80 Processor BOOTPROM Checksum Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.

Continued on next page

Table 11-300. TEST #80 Processor BOOTPROM Checksum Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The computed checksum did not match the BOOTPROM checksum. The system may not continue to operate correctly. The system may fail at some future date when the corrupted area the bootstrap BOOTPROM is accessed. 1. Replace the Processor circuit pack. 2. If the test continues to fail after replacing the Processor circuit pack, follow normal escalation procedures. To replace the Processor circuit pack, refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures".
	PASS	The computed checksum matched the BOOTPROM checksum. This part of the Processor will continue to operate normally.

Processor Bus Timeout Exception Test (#82)

This test is a nondestructive test. The test is used to verify that the RISC Processor can intentionally cause a BUS TIMEOUT EXCEPTION (BTE) and then verifies if it vectors to the correct interrupt routine. This is basically a test of the internal operation of the RISC Processor chip and the bus timeout circuitry.

Table 11-301. TEST #82 Processor Bus Timeout Exception Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.

Continued on next page

Table 11-301. TEST #82 Processor Bus Timeout Exception Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The interrupt was not detected or acted upon. 1. Repeat the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, the Processor circuit pack should be replaced. The replacement must have enough memory for this system. Refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures". 3. If replacement of the Processor circuit pack still results in test failure, the following circuit packs should be replaced, one at a time in the order provided: TN765 Processor Interface, TN777B Network Control, TN778 Packet Control, and TN772 Duplication Interface circuit packs. The test should then be repeated. 4. If the test still fails after you replace all the circuit packs discussed in the previous step, follow normal escalation procedures.
	PASS	The interrupt was correctly detected. The RISC Processor is functioning correctly.

Processor Cache Test (#895)

This test is a nondestructive test. This test overwrites the contents in the Instruction and Data Caches, requiring them to be refilled during normal execution.

This test verifies that the Processor Instruction and Data Caches are functional. Some errors in the caches will simply reduce performance by forcing instructions or data to be read from memory more often than would normally be necessary. In any case, cache problems are serious and the Processor circuit pack must be replaced as soon as possible if they are detected.

Table 11-302. TEST #895 Processor Cache Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.

Continued on next page

Table 11-302. TEST #895 Processor Cache Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Processor cache is not functioning correctly. 1. Replace the Processor circuit pack immediately. 2. If the test continues to fail after replacing the Processor circuit pack, follow normal escalation procedures. To replace the Processor circuit pack, refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures".
	PASS	The cache portion of the Processor circuit pack is operating correctly.

Processor Cache Audit (#896)

This nondestructive audit checks the state of the Cache Parity bit maintained by the RISC CPU. If this bit is set, there may be problems with either the CPU, the Instruction, or Data Cache. An indication of bad cache parity won't itself mean that the system won't operate, but minor to severe performance degradation may be present. For example, a single bad bit in either cache could cause this bit to be set. If the faulty word is seldom accessed, the impact will be small. If the bit is accessed frequently, there could be serious problems with much, or all, of the cache (stuck data bit) with the only direct indication again being the cache parity error or cache test error.

Table 11-303. TEST #896 Processor Cache Audit

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-303. TEST #896 Processor Cache Audit — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Cache Parity Error bit is set, there may be problems with either the CPU or the Instruction or Data Cache. 1. Retry the command. 2. If the test continues to fail, run test processor a|b long. 3. If the Processor Cache test (#895) or the Processor Cache Audit (#896) fails, replace the Processor circuit pack. 4. If the test continues to fail after replacing the Processor pack, follow normal escalation procedures. To replace the Processor circuit pack, refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures".
	PASS	The Processor has not detected any parity errors in the Instruction and Data Caches since the last time this audit was run.

Processor Write Buffer Test (#900)

This test is a nondestructive test. This test verifies that the Write Buffer operates properly on the Processor circuit pack. Failure of this test is serious. The Processor circuit pack must be replaced as soon as possible.

Table 11-304. TEST #900 Processor Write Buffer Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
	FAIL	The Processor Write Buffer is not operating correctly. 1. Replace the Processor circuit pack immediately. 2. If the test continues to fail after replacing the Processor circuit pack, follow normal escalation procedures. To replace the Processor circuit pack, refer to "Replacing Port Circuit Packs" in Chapter 5, "Routine Maintenance Procedures".
	PASS	The Write Buffer portion of the Processor circuit pack is operating correctly.

PROCR (Processor Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PROCR	MAJOR	test processor a/b sh r/c	80286/386 Processor Circuit Pack

NOTE:
For systems with a TN790 RISC Processor circuit pack see maintenance object PROCR (TN790 Circuit Pack) in this section.

NOTE:
Alarms on the TAPE [286 systems only], MEM-BD [386 systems only], PROCR and PR-MAINT maintenance objects (MOs) are indicated by the red LED on the Processor circuit pack.

This section applies to both the TN773 [G3iV1.1-286] and the TN786B Processor circuit packs (PROCR). The TN786B has a 80386 processor that uses on-board flash ROM and DRAM memory, while the TN773 has a 80286 processor that uses DRAM memory only.

The TN773 Processor circuit pack is comprised of the 80286 Processor (PROCR) and the Maintenance/Tape Processor (PR-MAINT). Memory is on two TN770 Memory circuit packs: MEM-BD 1 and MEM-BD (see Figure 11-89).

The TN786B Processor circuit pack is comprised of the 80386 Processor (PROCR), the MainTenance Processor (PR-MAINT) and Memory (MEM-BD). Except for G3iV2-386, which also contains the CPP1 circuit pack, 386 systems contain just the TN786B circuit pack. (see Figure 11-89).

The 80286/386 Processor circuit pack portion is responsible for the execution of the DEFINITY Generic 1 software package. This includes all of the call processing, maintenance, and administration functions. The 80286/386 Processor circuit pack is the most critical component to the correct operation of the system.

The PR-MAINT (Maintenance/Tape Processor for G3iV1.1-286 and MainTenance Processor for 386 systems) is responsible for monitoring the sanity of the 80286/386 Processor circuit pack as well as the environmental conditions. The PR-MAINT provides the serial interfaces for the administration terminal and for the Call Detail Recording (CDR) ports. For G3iV1.1-286 only, the PR-MAINT contains the hardware required for controlling the tape drive. The PR-MAINT also provides the communications interface to INADS for alarm reporting and remote maintenance capability.

In High and Critical Reliability systems, the PR-MAINT is part of the communications path between the Active Processor Element and the Standby Processor Element.

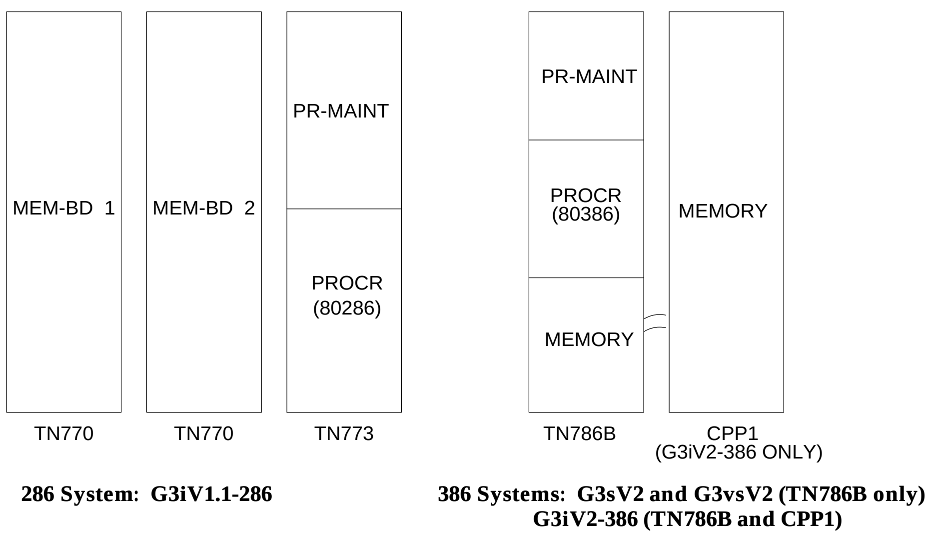

Figure 11-89. Configurations for 286 and 386 Systems

Hardware Error Log Entries and Test to Clear Values

80286/386 Processor Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0[2]	0	Any	Any	Any	test processor a/b r 1
1 (a)	0	Software Initiated Interrupt Test (#77)	MAJOR	ON	test processor a/b r 3
769 (b)	0	ROM Checksum Test (#80)	MAJOR	ON	test processor a/b r 5
1025 (c)	0	Processor Non-maskable Interrupt Test (#82)	MAJOR	ON	test processor a/b r 2
1281 (d)	0	Processor Sanity Timer Test (#83)	MAJOR	ON	test processor a/b l r 2

1 Software does not accept the repeat option on the TN773 circuit pack [G3iV1.1-286]. The repeat option is valid only on the TN786B circuit pack. You must manually repeat the command with the long option the designated number of times from the administration terminal and from a remote SAT because the Sanity Timer Test (#83) logs you off. In G3iV1.1-286, if the **test processor long** System Technician command is executed six times back-to-back, the system goes into SPE-DOWN mode.

2 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The Software Initiated Interrupt Test (#77) failed. Refer to the FAIL condition of this test for further action.

b. The ROM Checksum Test (#80) failed. Refer to the FAIL condition of this test for further action.

c. The Processor Non-maskable Interrupt Test (#82) failed. Refer to the FAIL condition of this test for further action.

d. The Processor Sanity Timer Test (#83) failed. Refer to the FAIL condition of this test for further action.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. By clearing error codes associated with the *Processor Non-maskable Interrupt Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Processor Non-maskable Interrupt Test (#82)	X	X	ND
Processor ROM Checksum Test (#80)	X	X	ND
Processor Software Initiated Interrupt Test (#77)	X	X	ND
Processor Sanity Timer Test (#83)		X	D
MTP Outpulse Relay Test (#102) (a)	X	X	ND
MTP Analog Loop Around Test (#103) (a)	X	X	ND
MTP Sanity Handshake Test (#106) (a)	X	X	ND
MTPSAT Loop Around Test (#228) (a)	X	X	ND
MTP Aux Loop Around Test (#229) (a)	X	X	ND
MTP Reset Test (#101) (a)		X	D
MTP Dual Port Ram Test (#104) (a)		X	D
Read All Memory Test (#85)(b)		X	ND
Memory Error Detection Test (#87)(b)	X	X	ND
Text Checksum Test (#86)(b)		X	ND
Memory Functional Test (#332) (c)(b)		X	D
Memory Board Check Test (#631) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation for a description of these tests.

b. Refer to MEMORY [386 systems only] Maintenance documentation for a description of these tests.

Processor Software Initiated Interrupt Test (#77)

This test is a nondestructive test. The test verifies if the 80286/386 Processor can exercise the three types of software-initiated interrupts:

- Divide by zero
- Single step
- One byte interrupt instruction.

Table 11-305. TEST #77 Processor Software Initiated Interrupt Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-305. TEST #77 Processor Software Initiated Interrupt Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The processor did not detect the software interrupt condition. As a result, the processor executed the incorrect interrupt vector. The system may or may not continue to operate correctly. 1. Repeat the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, the Processor circuit pack should be replaced. Refer to "Circuit Pack Replacement Procedure" in Chapter 8, "Reliability Systems: A Maintenance Aid". **WARNING:** *If the TN786B circuit pack [386 systems only] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The processor detected the software interrupt condition, and it executed the correct interrupt vector. The system continues to operate correctly.

Processor ROM Checksum Test (#80)

This test is a nondestructive test. The test computes the checksum of the processor's bootstrap ROM, and it compares this checksum to a predetermined value stored within the ROM. A failure of this test indicates corruption of the ROM.

Table 11-306. TEST #80 Processor ROM Checksum Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
	FAIL	The computed checksum did not match the ROM checksum. The system may or may not continue to operate correctly. The system may fail later when some action requires access to the corrupted area of the bootstrap ROM. 1. The Processor circuit pack should be replaced. Refer to "Circuit Pack Replacement Procedure" in Chapter 8, "Reliability Systems: A Maintenance Aid". **WARNING:** *If the TN786B circuit pack [386 systems only] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.*
	PASS	The computed checksum matched the ROM checksum. The system continues to operate normally.

Processor Non-maskable Interrupt Test (#82)

This test is a nondestructive test. The test is used to verify that the 80286/386 Processor can detect and respond to non-maskable interrupts. For example, the processor intentionally causes a BUS TIMEOUT EXCEPTION (BTE) and then verifies if it vectors to the correct interrupt routine. This is basically a test of the internal operation of the 80286/386 CPU chip.

Table 11-307. TEST #82 Processor Non-maskable Interrupt Test

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-307. TEST #82 Processor Non-maskable Interrupt Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The interrupt was not detected or acted upon. 1. Repeat the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, the Processor circuit pack should be replaced. Refer to "Circuit Pack Replacement Procedure" in Chapter 8, "Reliability Systems: A Maintenance Aid". **WARNING:** *If the TN786B circuit pack [386 systems only] must be replaced, and if there is a blank in the Expansion Memory circuit pack slot (that is, in the slot immediately to the right of the TN786B circuit pack), remove the blank before removing the circuit pack. Otherwise, the circuit pack and/or the two connectors that are used to connect the Expansion Memory circuit pack (if available) might become damaged.* 3. If replacement of the Processor circuit pack still results in test failure, the following circuit packs should be replaced, one at a time in the order provided: TN770 Memory [G3iV1.1-286 only] Expansion Memory [G3iV2-386 only] TN765 Processor Interface, TN777B Network Control, TN778 Packet Control, and TN772 Duplication Interface circuit packs. The test should then be repeated. 4. If the test still fails after you replace all the circuit packs discussed in the previous step, the problem must be in the control carrier, and the carrier should be replaced.
	PASS	The interrupt was correctly detected. The 80286/386 CPU chip is functioning correctly.

Processor Sanity Timer Test (#83)

This test is destructive.

This test causes service to be disrupted for about seven seconds on the TN773 and for about one second on the TN786B. During this time, the system does not respond to any user action.

This test checks to see if the 80286/386 processor watch-dog sanity timer is functioning correctly. The processor intentionally allows the sanity timer to time out. If the processor detects itself being reset, the test passes, and the processor continues to execute normally. If the processor does not detect a reset, the test has failed. If this test continues to fail, the processor pack should be replaced as soon as possible. The sanity timer is not critical to system operation, but it is needed for processor recovery if the processor stops functioning.

Table 11-308. TEST #83 Processor Sanity Timer Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System software resources required to run this test are not available. 1. Repeat the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-308. TEST #83 Processor Sanity Timer Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The sanity timer did not time out as expected. The system continues to function normally. If the processor gets into an infinite loop, the reset CANNOT be detected, and the system DOES NOT reboot itself to clear the problem. 1. Repeat the command at one-minute intervals a maximum of five times. 2. If test continues to fail, the Processor circuit pack should be replaced as soon as possible.
	PASS	The sanity timer went off as expected. The system continues to function normally. If the processor gets into an infinite loop, the reset IS detected, and the system reboots itself to clear the problem.

RING-GEN (Analog Ring Generator)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
RING-GEN	MAJOR	test environment P	Analog Ring Generator

1 Where P is an appropriate port network number determined via the Port field from the Alarm or Error Log.

All analog phones in DEFINITY Generic 1 cabinets must be provided with a voltage that allows them to ring. The Analog Ring Generator MO represents the device that provides the ringing voltage for analog phones in a multicarrier or single carrier cabinet system. In a multicarrier cabinet system, the Analog Ring Generator resides in the PDU. Figure 11-90 shows the position of the PDU and illustrates that fuse F9 is used for the Analog Ring Generator. Figure 11-91 shows the position of the fuses on the PDU and describes how to replace a fuse. In a single carrier cabinet system, the Analog Ring Generator is part of the WP-91153 power unit, and each carrier in the single carrier cabinet contains its own Analog Ring Generator. A ringing voltage generator failure means that no ringing will occur on analog phones; however, ringing on digital and hybrid phones will still occur.

The ringing voltage is monitored by the Tone-Clock circuit pack. In a port network with duplicated Tone-Clocks, it is the active Tone-Clock that performs this function. In an EPN made up of single-carrier cabinets, the Tone-Clock monitors only the ringing voltage in the carrier that contains the tone clock.

Also, if the TN2182 Tone-Clock is installed in the Processor Interface slot, the ringing voltage is not monitored.

The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins. For more information, refer to the "Troubleshooting Backplane Voltage Problems" section in Chapter 5, "Routine Maintenance Procedures".

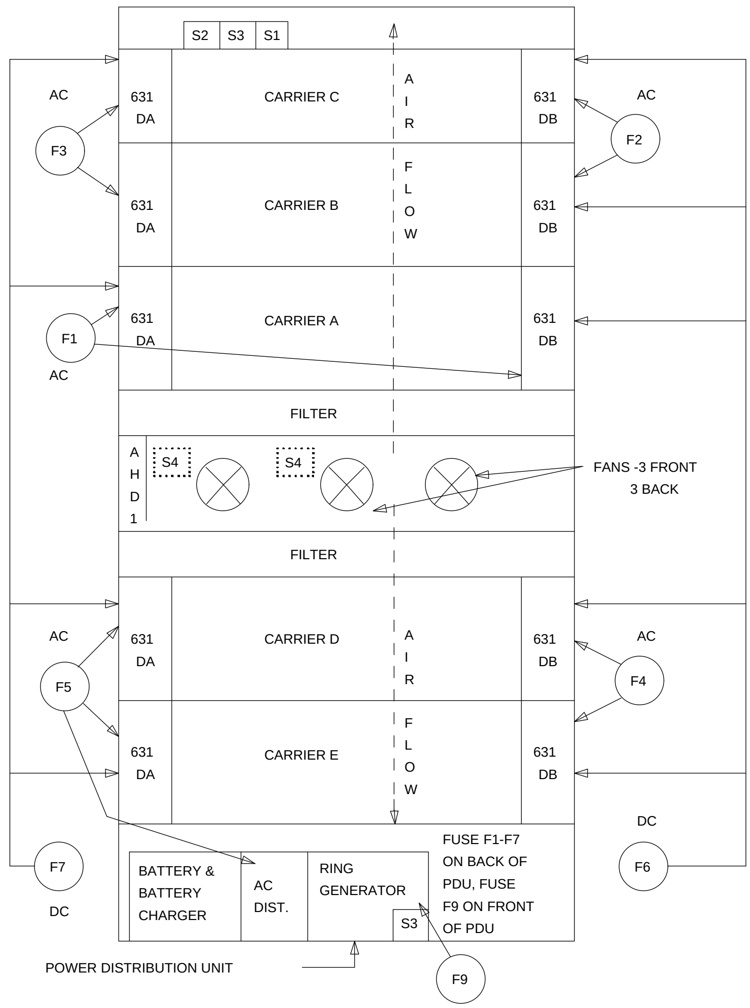

Figure 11-90. Multicarrier Cabinet Environment Components

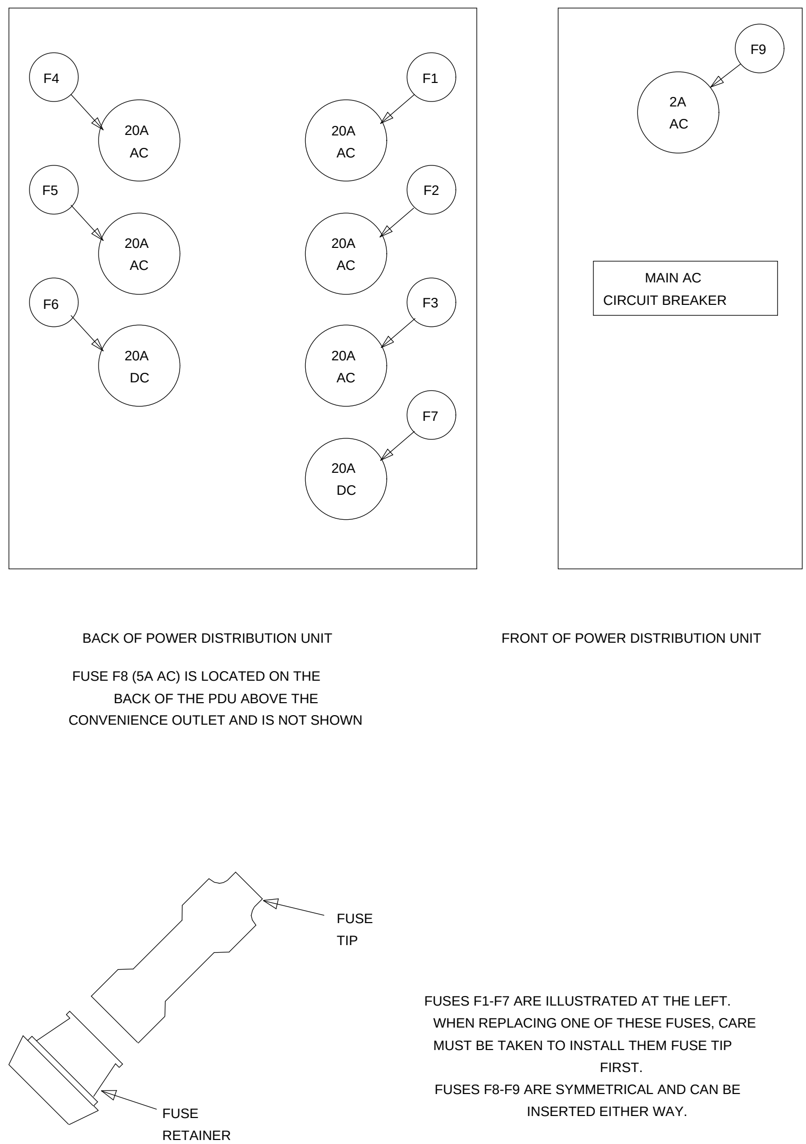

Figure 11-91. Multicarrier Cabinet Fuse Location and Replacement

Hardware Error Log Entries and Test to Clear Values

Analog Ring Generator Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment UU
1		Analog Ring Generator Query Test (#118)	MAJOR	ON	test environment UU r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *Analog Ring Generator Initialization Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Multicarrier Cabinet

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Ring Generator Initialization Test (#117)	X	X	ND
Analog Ring Generator Query Test (#118)	X	X	ND
Battery & Battery Charger Query Test (#5) (a)	X	X	ND
AC Power Query Test (#78) (b)	X	X	ND
Power Unit Query Test (Carrier E) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier D) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier A) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier B) (#127) (c)	X	X	ND
Power Unit Query Test (Carrier C) (#127) (c)	X	X	ND
Emergency Transfer Query Test (#124) (d)	X	X	ND
Cabinet Sensors Query Test (#122) (e)	X	X	ND
External Alarm Lead Query Test (#120) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to POWER (Battery & Battery Charger) Maintenance documentation for a description of this test.

b. Refer to AC-POWER (AC Power) Maintenance documentation for a description of this test.

c. Refer to CARR-POW (Carrier Port Power Unit) for AC- and DC-Powered Systems Maintenance documentation for a description of this test.

d. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

e. Refer to CABINET (Cabinet Sensors) Maintenance documentation for a description of this test.

f. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

Single-Carrier Cabinet

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Ring Generator Initialization Test (#117)	X	X	ND
Analog Ring Generator Query Test (#118)	X	X	ND
Single-Carrier Power Query Test (#79) (a)	X	X	ND
Emergency Transfer Query Test (#124) (b)	X	X	ND
External Alarm Lead Query Test (#120) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to DC-POWER (Power) Maintenance documentation for a description of this test.

b. Refer to EMG-XFER (Emergency Transfer) Maintenance documentation for a description of this test.

c. Refer to EXT-DEV (External Alarm) Maintenance documentation for a description of this test.

Analog Ring Generator Initialization Test (#117)

The TN768, or TN780 will report an error to the system software if the ringing voltage falls to low (only if system software has made a request to the TN768, or TN780 to monitor the voltage). The Analog Ring Generator Initialization Test sends a request to the TN768, or TN780. If there are redundant tone/clock circuit packs in the port network, then the request is sent only to the active tone/clock.

Table 11-309. TEST #117 Analog Ring Generator Initialization Test

Error Code	Test Result	Description/ Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	The system software is unable to determine the active tone/clock circuit pack, unable to allocated the resources necessary to run the test, or unable to send a down link message. 1. Wait for the green LED on the active tone/clock to go out; use the **status port-network** command to determine the active Tone/Clock circuit pack. 2. Rerun the test. If the test aborts again, refer to TDM-CLK Maintenance documentation.
2000	ABORT	Response to the request was not received within the allowable time period. 1. Look for TDM-CLK errors and alarms. Resolve all other Tone/Clock problems first. 2. Rerun the test.
1005	ABORT	The tone/clock is unable to read the analog ringing voltage level when the tone/clock is in the Processor Interface slot. This test is not available for the Processor Port Network in this configuration.
	PASS	The active Tone/Clock has successfully been enabled to monitor the ringing voltage level.

Analog Ring Generator Query Test (#118)

This test requests the Active Tone-Clock circuit pack to check the ringing voltage. The tone/clock circuit pack replies with PASS if the ringing voltage is adequate to ring the analog phones. If not, the active tone/clock circuit pack replies with a FAIL. The Analog Ring Generator Query Test then reports the result.

Table 11-310. TEST #118 Analog Ring Generator Query Test

Error Code	Test Result	Description/ Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	Could not seize the resources to run the test. Other maintenance is running on the active tone/clock circuit pack. 1. Wait for the green LED on the active tone/clock circuit pack to go out; (use the **status port-network** command to determine the Active tone/clock circuit pack). 2. Rerun the test. If the test aborts again, refer to TDM-CLK (TDM Bus Clock) Maintenance documentation.
2000	ABORT	Response to the request was not received within the allowable time period. 1. Look for TDM-CLK errors and alarms. Resolve all other tone/clock problems first. 2. Rerun the test.
1005	ABORT	The tone/clock is unable to read the analog ringing voltage level when the tone/clock is in the Processor Interface slot. This test is not available for the Processor Port Network in this configuration.

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Table 11-310. TEST #118 Analog Ring Generator Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	Ringing voltage is below acceptable levels. PROCEDURE FOR A MULTI-CARRIER CABINET SYSTEM. 1. If this is a High or Critical Reliability system, determine the active Tone-Clock circuit pack by issuing a **status port network** command. Make the Standby Tone-Clock circuit pack active via the **set tone-clock PC** command and rerun the test. a. If the test passes, the trouble is with the new Standby Tone-Clock circuit pack. Refer to the TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for details on replacing the Standby Tone-Clock circuit pack. After the circuit pack is replaced, make this Tone-Clock active again by issuing the **set tone-clock PC** command and rerun the test. b. If the test fails, then proceed with Step 2. 2. Look for and resolve CARR-POW (Carrier Port Power Supply Unit) alarms first, and then rerun the test. 3. Check fuse F9 on the Power Distribution Unit. Replace F9 if it is blown, and rerun the test. If the test still fails, then an Analog Line circuit pack could be defective and causing the Analog Ring Generator and/or fuse F9 to fail. 4. Unseat all Analog circuit packs in the affected cabinet, and replace fuse F9 again if needed. Rerun the test.

Continued on next page

Table 11-310. TEST #118 Analog Ring Generator Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	5. If the test passes, then the Analog Ring Generator is healthy, and one of the Analog circuit packs is defective. Replace the Analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. When the defective Analog circuit pack is found, replace it. Rerun the test. If the test still fails, proceed with Step 6. 6. Since the test still fails, the Analog Ring Generator is defective. Replace the Analog Ring Generator as follows: a. Open the PDU compartment door. The door is hinged on the right and has a magnetic latch on the left. b. If the reset button on the Analog Ring Generator is out, press it in. c. Originate calls to several analog stations on different port circuit packs in different carriers in the affected port network. d. If called stations ring, the fault is cleared. Proceed to Step f. If no stations ring, replace the Analog Ring Generator. To replace the Analog Ring Generator, first disconnect the output (P6) and input (P7) connectors from the Analog Ring Generator and then remove the two screws at the base of the Analog Ring Generator. e. Replace the Analog Ring Generator, secure it with the two screws at the base, and replace the P6 and P7 connectors (P6 goes on top). f. Rerun the test. If the test still fails, proceed to Step 7. 7. The active tone/clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the Active tone/clock and rerun the test. Refer to TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for details on replacing the tone/clock. Rerun the test. If the test still fails, escalate the problem.

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Table 11-310. TEST #118 Analog Ring Generator Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	PROCEDURE FOR A SINGLE-CARRIER CABINET SYSTEM. This failure indicates that there is no ringing voltage in the carrier where the active tone/clock circuit pack resides. Other carriers may or may not have ringing voltage. 1. If this is a Duplicated Option system, then determine the active Tone-Clock circuit pack by issuing a **status port-network** command. Make the Standby Tone-Clock circuit pack active via the **set tone-clock PC** command and rerun the test. a. If the test passes, then the trouble is with the "new" Standby Tone-Clock circuit pack. Refer to TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for details on replacing the Standby Tone-Clock circuit pack. After the circuit pack is replaced, make this Tone-Clock active again by issuing the **set tone-clock PC** command and rerun the test. b. If the test fails, then proceed with Step 2. 2. Unseat all analog circuit packs in the cabinet that contains the Active Tone/Clock circuit pack and rerun the test. 3. If the test passes, then the Analog Ring Generator is healthy and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. When the defective analog circuit pack is found, replace it. Rerun the test. If the test still fails, go to Step 4. 4. Replace the WP-91153 power unit for the affected carrier, and rerun the test. If the test still fails, go to Step 5. 5. The active tone/clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the active tone/clock and rerun the test. Refer to TONE-BD Maintenance documentation for details on replacing the active tone/clock circuit pack. Rerun the test. If the test still fails, escalate the problem.

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Table 11-310. TEST #118 Analog Ring Generator Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	FOR A MULTI-CARRIER CABINET SYSTEM. The analog ringing voltage level is acceptable. FOR A SINGLE-CARRIER CABINET SYSTEM. For a single-carrier cabinet stack, ringing voltage is acceptable in the cabinet containing the active tone/clock circuit pack.

S-SYN-BD (Speech Synthesis Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
S-SYN-BD	MIN	test board PCSS sh	Speech Synthesis Circuit Pack
S-SYN-BD	WRN	test board PCSS sh	Speech Synthesis Circuit Pack

1 Where P is the port network number (1 for PPN and 2 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also S-SYN-PT (Speech Synthesis Port) Maintenance documentation for related port information.

S-SYN-PT (Speech Synthesis Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
S-SYN-PT	MAJOR	test port PCSSpp sh	Speech Synthesis Port
S-SYN-PT	MINOR	test port PCSSpp l	Speech Synthesis Port
S-SYN-PT	WARNING	test port PCSSpp sh	Speech Synthesis Port

1 Where P is the port network number (1 for PPN and 2 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

The TN725 Speech Synthesis circuit pack provides four independent Speech Synthesis Ports which may be connected to any of the voice time slots on the TDM Bus. Each Speech Synthesis Port consists of a speech synthesizer device (SSD) and is managed by a custom-coded programmable speech synthesizer (PSS) controller. The PSS controller is, in turn, controlled by the on-board microprocessor via a command interface specifically designed for this application. The PSS controller's main function is the orderly transfer of encoded speech from the speech vocabulary read-only memory (ROM) to the SSDs. The SSDs decode it and produce 64 kb/s 5-255 PCM (Pulse Code Modulation) speech. The encoded speech is stored in up to 512K bytes of on-board read-only memory (ROM). In addition, each Speech Synthesis Port has an associated dual-tone multifrequency (DTMF) receiver to receive touch-tone digits from a station set connected to the port via a voice time slot. The station set may be connected to the Speech Synthesis Port through either a line or trunk circuit.

When there is an incoming call to a port, the "listen" network time slot is connected to the DTMF receiver input and the "talk" network time slot is connected to the SSD output. This enables the Speech Synthesis Port to support speech synthesis features or touch-tone input with voice response features. Some of the features that use the Speech Synthesis Port's capabilities include Leave Word Calling, Automatic Circuit Assurance, Automatic Wakeup (hotel-motel), and do Not Disturb (hotel-motel).

The Speech Synthesis circuit pack should not be confused with the Announcement circuit pack as different voice features are supported by each circuit pack.

Hardware Error Log Entries and Test to Clear Values

Speech Synthesis Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1(a)	17672	None			
18	0	busyout port PCSSpp	WARNING	OFF	release port PCsspp
130(b)		None	WARNING	ON	test port PCSSpp sh
257		Speech Synthesis PSS Handshake Test (#168)	MAJOR	ON	test port PCSSpp sh r 2
513	17922	Speech Synthesis Memory Test (#166)	MINOR	ON	test port PCSSpp sh r 2
769	17664	Speech Synthesis DTMF Receiver Inquiry Test (#164)	MINOR	ON	test port PCSSpp sh r 2
1025	17670	Speech Synthesis SSD Inquiry Test (#167)	MINOR	ON	test port PCSSpp sh r 2
1281		Speech Synthesis DSP Tone Test (#165)	MINOR	ON	test port PCSSpp sh r 2
1537		Speech Synthesis Memory Test (#166)	MINOR	ON	test port PCSSpp sh r 2
1793		Speech Synthesis DTMF Receiver Test (#163)	MINOR	ON	test port PCSSpp l r 2
2049(c)		Conference Circuit Test (#7)	MINOR	ON	test port PCSSpp l r 2
2305		NPE Crosstalk Test (#6)	MINOR	ON	test port PCSSpp l r 2
3840(d)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. An in-line failure of the on-board microprocessor/PSS handshake has occurred. Refer to Test #168 for repair procedures.

b. This error type indicates that the circuit pack been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. A transient error that does not cause an alarm can occasionally occur during a SPE, TDM BUS, or Tone Clock interchange. Test the port and follow the instructions for conference Test (#7).

d. This error is not service-affecting and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test,* for example, you may also clear errors generated from other tests in the testing sequence.

For example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Speech Synthesis PSS Handshake Test (#168)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Speech Synthesis DTMF Receiver Test (#163)		X	ND
Speech Synthesis Memory Test (#166)	X	X	ND
Speech Synthesis DSP Tone Test (#165)	X	X	ND
Speech Synthesis SSD Inquiry Test (#167)	X	X	ND
Speech Synthesis DTMF Receiver Inquiry Test (#164)	X	X	ND
Speech Synthesis Parameter Update Test (#169)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may occur. This test is usually only part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

Table 11-311. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) Maintenance documentation to diagnose any Active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-311. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the test at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test and the test has been aborted. You must wait until the port is idle (yellow LED if off) before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-311. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining the Error Log.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-312. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid call during the test and the test has been aborted. You must wait until the port is idle (yellow LED if off) before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is not in use, escalate the problem.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. 1. Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.

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Table 11-312. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. 1. Retry the test. 2. If the Test continues to fail then replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and examining the Error Log.

Speech Synthesis DTMF Receiver Test (#163)

A series of DTMF tones are conferenced from the TDM Bus into the port's DTMF receiver and checked to see if the correct tones have been detected during the correct intervals. If all the DTMF tones were detected correctly, the test passes. If any of the tones were not detected correctly, the test fails.

Table 11-313. TEST #163 Speech Synthesis DTMF Receiver

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-313. TEST #163 Speech Synthesis DTMF Receiver — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	DTMF tones were not detected. This type of failure may cause features using touch-tone input to the Speech Synthesis Port to malfunction. 1. Verify that the Tone-Clock circuit pack is functioning correctly by checking the Error Log and using the **test tone-clock long** command. 2. If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The port has detected all DTMF tones correctly. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis DTMF Receiver Inquiry Test (#164)

This test determines the sanity of the port's DTMF receiver. The on-board microprocessor tests the port's DTMF receiver and determines if it is in a sane (test passes) or insane (test fails) condition.

Table 11-314. TEST #164 Speech Synthesis DTMF Receiver Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The DTMF receiver for this port is insane. 1. If the test fails again, replace the circuit pack.
	PASS	The DTMF receiver for this port is sane. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis DSP Tone Test (#165)

The digital signal processor (DSP) associated with each port can generate a 440-Hz tone whose presence can be detected by TN748 General Purpose Tone Detector circuit packs. A 440-Hz tone is generated for 500 msec on a specified time slot which is being listened to by the detector circuit. If the detector determines the tone is present on the time slot, the test passes; otherwise, it fails.

Table 11-315. TEST #165 Speech Synthesis DSP Tone Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1001 1002 1003	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-315. TEST #165 Speech Synthesis DSP Tone Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1021	ABORT	The 440-Hz tone was not detected by the Tone Detector circuit and inter-digit time-out has occurred on the Tone Detector circuit. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, verify all Tone Detector circuit packs in the system are functioning correctly by checking the Error Log and using the **test board PCSS long** command. Replace any faulty Tone Detector circuit packs and repeat the test. 3. If the test continues to abort, replace the Speech Synthesis circuit pack.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The 440-Hz tone was not detected by the Tone Detector circuits. 1. If the test fails again, verify all Tone Detector circuit packs in the system are functioning correctly by checking the Error Log and using the **test board PCSS long** command. Replace any faulty Tone Detector circuit packs and repeat the test. 2. If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The 440-Hz tone has been detected correctly. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis Memory Test (#166)

The encoded speech for the Speech Synthesis circuit pack is stored in on-board read-only memory. A checksum is computed for each 32K speech memory block and compared against a known checksum value. If all computed checksum values are successfully compared against the stored checksum values, the test passes. If, while testing the speech complex memory, the on-board microprocessor finds a memory error, the test is terminated and a failure is reported. This type of failure may affect other ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port.

Table 11-316. TEST #166 Speech Synthesis Memory Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1019	ABORT	Test is already running on a different port, possibly due to background maintenance activity. Only one of these tests may be active on a circuit pack at a time. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-316. TEST #166 Speech Synthesis Memory Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The computed checksum from the speech vocabulary read-only memory did not compare correctly with the stored checksum. This type of failure may cause features using the Speech Synthesis Port's speech services to malfunction and result in degradation of synthesized speech quality ranging from insignificant to major. 1. Replace the circuit pack.
	PASS	The computed checksum values were successfully compared against the stored checksum values. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis SSD Inquiry Test (#167)

This test determines the sanity of the specified port's Speech Synthesis Device (SSD). The on-board microprocessor tests the port's SSD and determines if it is in a sane (test passes) or insane (test fails) condition. Other ports on the Speech Synthesis circuit pack continue to function correctly during this type of failure.

Table 11-317. TEST #167 Speech Synthesis SSD Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	The SSD is insane. 1. Replace the circuit pack.
	PASS	The SSD is sane. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis PSS Handshake Test (#168)

This test verifies control functionality between the on-board microprocessor and PSS controller. A failure occurs if either of the following events occur:

- The on-board microprocessor times out while waiting for the PSS controller to respond.
- An invalid command is received by the on-board microprocessor from the PSS controller.

This type of failure affects all four ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port.

Table 11-318. TEST #168 Speech Synthesis PSS Handshake Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-318. TEST #168 Speech Synthesis PSS Handshake Test — *Continued*

Error Code	Test Result	Description/ Recommendation
Any	FAIL	The on-board microprocessor has timed out while waiting for the PSS controller to respond or an invalid command has been received by the on-board microprocessor from the PSS controller. This type of failure may cause features using the Speech Synthesis Port's speech services to malfunction. 1. Replace the circuit pack.
	PASS	The on-board microprocessor/PSS handshake is working correctly. User-reported troubles should be investigated using other tests and verifying other ports on this circuit pack are working correctly.

Speech Synthesis Parameter Update Test (#169)

This test updates the DTMF interdigit time-out parameter used by the Speech Synthesis circuit pack to be consistent with that specified by the switch processing element (SPE).

Table 11-319. TEST #169 Speech Synthesis Parameter Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. You must wait until the port is idle (yellow LED if off) before retesting. 1. If the port is idle, retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	An internal system error has occurred. 1. If the test continues to fail, escalate the problem.
	PASS	The DTMF interdigit time-out parameter has been updated. 1. User-reported troubles should be investigated using other tests and by verifying that other ports on this circuit pack are working correctly.

SEC-CDR (SEC-CDR Link Maintenance)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
PRI-CDR/SEC-CDR	MINOR	test cdr-link primary/secondary l	CDR Link
PRI-CDR/SEC-CDR	WARNING	test cdr-link primary/secondary	CDR Link

The SEC-CDR (SEC-CDR Link) maintenance strategy is covered in the PRI-CDR/SEC-CDR (PRI-CDR Link) Maintenance documentation.

SHDW-CIR (Common Shadow Circuit)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SHDW-CIR[1]	MAJOR	test duplication 1C sh	Common Shadow Circuit

1 Determine the carrier to test via the Port field from the Alarm or Error Log.

The Common Shadow Circuit is that portion of the Duplication Interface circuit pack that is responsible for memory shadowing in a High or Critical Reliability system. All memory writes on the active SPE are detected by the Common Shadow Circuit on the active Duplication Interface circuit pack via the Memory Bus (M-BUS—bus used by control complex circuit packs to write/read memory and to communicate with one another). The write information is then passed to the Common Shadow Circuit on the Standby Duplication Interface circuit pack via the ICC which then executes the write into the Standby Memory circuit pack via the Standby M-BUS. In this way, the Standby SPE is kept up-to-date with the Active SPE and, as a result, is always ready to take over for the Active SPE.

Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance documentation for a detailed description of SPE-to-SPE connectivity and STBY-SPE (Standby SPE) Maintenance documentation for a description of how the Standby SPE is maintained.

Hardware Error Log Entries and Test to Clear Values

Common Shadow Circuit Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test duplication 1C sh r 1
1		Common Shadow Circuit Loop Back Test (#283)	MAJOR	ON	test duplication 1C r 3
257	Any	Common Shadow Circuit Time-Out Query Test (#285)	MAJOR	OFF	test duplication 1C l r 3
513	1,2	Common Shadow Circuit Address Decoder Test (#284)	MAJOR	ON	test duplication 1C r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Duplication Interface Circuit Pack Status Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Duplication Interface Circuit Pack Status Query Test (#315) (a)	X	X	ND
Duplication Interface Circuit Pack Sanity Circuit Test (#273) (a)		X	D
Duplication Interface Circuit Pack Sanity Maze Test (#277) (a)	X	X	ND
Duplication Interface Circuit Pack SPE A Loop Back Test (#275) (a)	X	X	ND
Duplication Interface Circuit Pack SPE B Loop Back Test (#276) (a)	X	X	ND
Duplication Interface Circuit Pack Manager I Loop Back Test (#274) (a)	X	X	ND
Inter-Duplication Interface Circuit Pack Loop Back Test (#280) (a)	X	X	ND
Duplication Interface Circuit Pack Background Test Query Test (#271)	X	X	ND
Duplication Interface Circuit Pack Invalid Message Query Test (#272) (a)	X	X	ND
Common Shadow Circuit M-BUS Time-Out Query Test (#285)		X	ND
Common Shadow Circuit Loop Back Test (#283)	X	X	ND
Common Shadow Circuit Address Decoder Test (#284)	X	X	ND
SPE Select Switch Query Test (#278) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance documentation for description of this test.

b. Refer to SPE-SELEC (SPE Select Switch) Maintenance documentation for description of this test.

Common Shadow Circuit Loop Back Test (#283)

This test allows maintenance to loop data through the common shadow circuit and examine the results. The test is designed to test the shadow data and shadow address portions of the common shadow circuit. The test is done entirely on the Duplication Interface circuit pack.

The Common Shadow Circuit is put into Maintenance Mode before the test is run. Maintenance software writes data into an address in the maintenance address space. This data is routed through the common shadow circuit and put into the FIFO bank of the common shadow circuit. Maintenance reads the contents of the FIFO bank and compares them with the value written to the maintenance address space. The test is repeated with another address in the maintenance address space.

This test does not disable the common shadow circuit and can be run with no disruption in service. The test must be executed from control carrier B to test the Duplication Interface B Common Shadow Circuit and from control carrier A to test the Duplication Interface A Common Shadow Circuit.

Table 11-320. TEST #283 Common Shadow Circuit Loop Back Test

Error Code	Test Result	Description/ Recommendation
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051	ABORT	Refer to the STBY-SPE Maintenance documentation for a description of these error codes.
1022	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The Common Shadow Circuit portion of the Duplication Interface circuit pack is defective and the Duplication Interface circuit pack must be replaced. 1. Follow the "Repair Procedures for High and Critical Reliability" section in Chapter 8, "Reliability Systems: A Maintenance Aid" and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, escalate the problem.

Continued on next page

Table 11-320. TEST #283 Common Shadow Circuit Loop Back Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or from Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315) in DUPINT Maintenance documentation.
	PASS	Part of the Common Shadow Circuit is operating properly; however, Tests #284 and #285 must pass before the Common Shadow Circuit on this Duplication Interface circuit pack is considered sane.

Common Shadow Circuit Address Decoder Test (#284)

This test verifies the operation of the shadow address decoder portion of the common shadow circuit. Software writes data into memory locations that should not be shadowed. The maintenance register of the common shadow circuit is examined to determine if the shadow address decoder permitted the write to be shadowed. The test fails if the writes were shadowed. This test is run only when demanded by maintenance software and can be run on both Duplication Interface circuit pack A and Duplication Interface circuit pack B. The same addresses used in the Common Shadow Circuit Circuit Loop Back Test (#283) are used.

Table 11-321. TEST #284 Common Shadow Circuit Address Decoder Test

Error Code	Test Result	Description/ Recommendation
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051	ABORT	Refer to the STBY-SPE Maintenance documentation for a description of these error codes.
	ABORT	Internal System Error.
1022	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-321. TEST #284 Common Shadow Circuit Address Decoder Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Common Shadow Circuit portion of the Duplication Interface circuit pack is defective and the Duplication Interface circuit pack must be replaced. 1. Follow the "Repair Procedures for High and Critical Reliability" in Chapter 8, "Reliability Systems: A Maintenance Aid" and replace the Duplication Interface circuit pack. 2. Rerun the test. If the test still fails, escalate the problem.
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD description for the Duplication Interface Circuit Pack Status Query Test (#315) in DUPINT Maintenance documentation.
	PASS	Part of the Common Shadow Circuit is operating properly; however, Tests #283 and #285 must pass before the Common Shadow Circuit on this Duplication Interface circuit pack is considered sane.

Common Shadow Circuit M-BUS Time-Out Query Test (#285)

An M-BUS time-out occurs when the Common Shadow Circuit on the Standby SPE attempts a memory write to the Memory circuit pack via the M-BUS and the write fails. The Common Shadow Circuit M-BUS Time-Out Query first tries to refresh the Standby SPE memory and then queries the Common Shadow Circuit on the Standby Duplication Interface circuit pack for the number of M-BUS time-outs. If there were any M-BUS time-outs, the test fails.

Table 11-322. TEST #285 Common Shadow Circuit M-BUS Time-Out Query Test

Error Code	Test Result	Description/ Recommendation
1029 1030 2011 2012 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051 2054	ABORT	Refer to the STBY-SPE Maintenance documentation for a description of these error codes.
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2013	ABORT	System resources required to run this test are not available.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-322. TEST #285 Common Shadow Circuit M-BUS Time-Out Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The tested Common Shadow Circuit is experiencing time-outs while trying to write to the Memory circuit pack over the M-BUS. 1. Verify that there are the same number of PI (Processor Interface) circuit packs in each carrier. 2. Verify that there are the same number of PKT-CTRL (Packet Control) circuit packs in each carrier. 3. Resolve all other DUPINT (Duplication Interface Circuit Pack), SHDW-CIR (Common Shadow Circuit), and PR-MAINT (Maintenance/Tape Processor) alarms before addressing this problem. 4. Rerun the test. If the test still fails, then the Memory circuit pack on the tested carrier is defective or the M-BUS is defective on the Standby carrier. Refer to the "Repair Procedures for High and Critical Reliability" section in Chapter 8, "Reliability Systems: A Maintenance Aid", and replace the Memory circuit pack. 5. Rerun the test. If the test still fails, escalate the problem. 6. Test the Standby SPE with the **test standby-pe short** command, and address all Duplication Interface circuit pack, Common Shadow Circuit, and Maintenance/Tape Processor tests that do not pass.
	NO BOARD	The Duplication Interface circuit pack has failed to handshake with either the active Maintenance/Tape Processor (in the case of Duplication Interface circuit pack A) or the Duplication Interface circuit pack A (in the case of Duplication Interface circuit pack B). 1. Refer to NO BOARD for a description of the Duplication Interface Circuit Pack Status Query Test (#315) in DUPINT Maintenance documentation.
	PASS	Part of the Common Shadow Circuit is operating properly. However, Tests #283 and #284 must pass before the Common Shadow Circuit on this Duplication Interface circuit pack is considered sane.

SHDW-LNK (Memory Shadowing Link)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SHDW-LNK	MAJOR	test shadow-link	Memory Shadowing Link

A High or Critical Reliability system contains two SPEs. One is known as the Active SPE and is the SPE that is currently responsible for all call processing, administration, and maintenance activities being performed by the system. The other SPE is known as the Standby SPE. The role of the Standby SPE is to be ready to take over as the Active SPE in the event that the current Active SPE fails.

The Standby SPE is usually in a mode known as Standby Mode in which it is ready to assume the role of the Active SPE. To do this, Standby SPE Memory (MEM-BD) must be an up-to-date reflection of Active SPE Memory. This is accomplished via the memory shadowing mechanism described below.

The SHDW-CIR (Common Shadow Circuit) on the Active SPE Duplication Interface circuit pack (DUPINT, TN772) detects all memory writes that the Active SPE Processor (PROCR) makes to Active SPE Memory. The Active SPE Common Shadow Circuit sends this information to the Common Shadow Circuit on the Standby SPE Duplication Interface circuit pack via the Inter-Carrier Cable (ICC). The Common Shadow Circuit on the Standby SPE Duplication Interface circuit pack then writes the data to Standby SPE Memory. This logical connection between Active SPE Memory and Standby SPE Memory is known as the SHDW-LNK (Memory Shadowing Link).

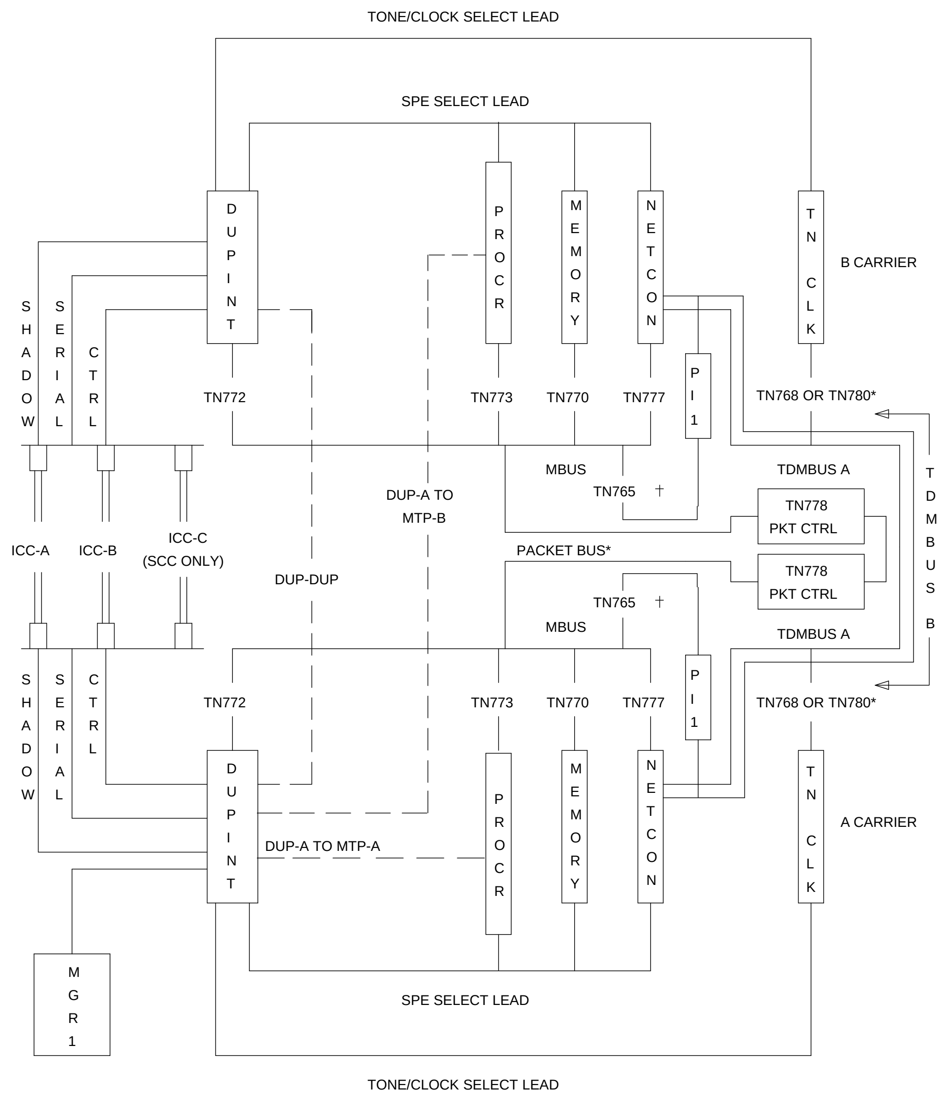
Although most of the components comprising the Memory Shadowing Link (that is, Active SPE Memory, both sets of Common Shadow Circuit, and Standby SPE Memory) may be tested individually, it is useful to test the integrity of the entire logical connection to verify that the shadowing mechanism is functional and that Standby SPE Memory is the same as Active SPE Memory. Therefore, this testing is done under the guise of the Memory Shadowing Link.

The logical connection between the Memory circuit packs of the two SPEs of a High or Critical Reliability system is shown in Figure 11-92. This connection includes the A carrier memory bus, the A carrier TN772 Duplication Interface circuit pack, the shadow extension in the ICC, the B carrier TN772 Duplication Interface circuit pack, and the B carrier memory bus. The dotted lines in Figure 11-92 represent important logical connections between components. The following abbreviations are used in Figure 11-92:

- DUPINT for Duplication Interface Circuit Pack
- PR MAINT for Maintenance/Tape Processor

- PROCR for 80286 or 80386 Processor Circuit Pack
- MEMORY for Memory [286 System only]
- CPP1 for Memory Expansion [G3iV2-386 only]
- MEM-CARD for Flash Memory Card [386 System only]
- NETCON for Network Control Circuit Pack
- PACKET BUS for Packet Control Pack
- TN CLK for Tone-Clock Circuit Pack
- MGR I for Manager I (G1) or G3MT Terminal
- TDM-BUS for Time Division Multiplex Bus
- M-BUS for Memory Bus
- ICC for Inter-Carrier Cable

Please refer to the DUPINT, SHDW-CIR, MEM-BD, PROCR, PR-MAINT, and STBY-SPE Maintenance documentation for more detailed descriptions of these components.



* G1.2 ONLY.
† MCC ONLY.
(IN A SINGLE-CARRIER CABINET CONFIGURATION, THERE CAN BE EITHER 0 or 1 PROCESSOR INTERFACE CIRCUIT PACK. IN A MULTI-CARRIER CABINET CONFIGURATION, THERE CAN BE 0, 1, OR 2 PROCESSOR INTERFACE CIRCUIT PACKS.)

Figure 11-92. SHDW-LNK Interactions for a High or Critical Reliability System

Hardware Error Log Entries and Test to Clear Values

Standby SPE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test shadow-link
2047		Shadow Link Test (#318)	MAJOR	OFF	test shadow-link
2048		Shadow Link Test (#318)	MAJOR	OFF	test shadow-link
2049		Shadow Link Test (#318)	MAJOR	OFF	test shadow-link
2050		Shadow Link Test (#318)	MAJOR	OFF	test shadow-link

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Shadow Link Test,* for example, you may also clear errors generated from other tests in the testing sequence.

The Short and Long Test Sequences for Memory Shadowing Link are identical. Only one test (Test #318) tests the Memory Shadowing Link.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Shadow Link Test (#318)	X	X	ND

1 D = Destructive; ND = Nondestructive

Shadow Link Test (#318)

Interactions

One interaction with the Standby SPE that results when testing the Memory Shadowing Link is as follows:

If the Standby SPE is in Maintenance Mode because a previous test command on a Standby SPE component was issued within the last three minutes, the Active SPE takes the Standby SPE out of Maintenance Mode and puts it in Standby Mode when the Shadow Link Test is run. Therefore, issuing another test command on a Standby SPE component requires that the Standby SPE be put into Maintenance Mode again before the test is run. Thus, the user notices a 1- to 20-minute delay when running another Standby SPE test after executing the Shadow Link Test (see the next Note).

NOTE:
In most cases, the delay lasts only one to two minutes. However, a 20-minute delay is possible.

Another interaction that the Memory Shadowing Link has with the Standby SPE is that if the Shadow Link Test fails, an error of type 67 is logged, and an alarm is raised against the STBY-SPE (Standby SPE). This is because the failure of the Shadow Link Test implies that Standby SPE Memory may not be an up-to-date reflection of Active SPE Memory and, therefore, that the Standby SPE may not be ready to take over as the Active SPE. Refer to "Hardware Error Log Entries and Test to Clear Values" section of STBY-SPE (Standby SPE) Maintenance documentation for more details.

Test Description

Because of the number and nature of steps that it performs, the Shadow Link Test takes from 1 to 5 minutes to run, depending on the load that the system is experiencing at the time. The Shadow Link Test performs the following activities to verify the integrity of the Memory Shadowing Link:

For a 286 based system:

- Disables shadowing from Active SPE Memory (MEM-BD) to Standby SPE Memory.
- Requests the Standby SPE Maintenance/Tape Processor (PR-MAINT) to release the Standby SPE processor (PROCR) for the Standby SPE Processor to clear Standby SPE Memory (zero all memory locations).
- Waits for Standby SPE Processor to report that Standby SPE Memory was successfully cleared.
- Requests the Standby SPE Maintenance/Tape Processor to hold the Standby SPE processor reset.

- Enables shadowing from Active SPE Memory to Standby SPE Memory and causes all of Active SPE Memory to be written to Standby SPE Memory (a refresh operation).
- Disables shadowing from Active SPE Memory to Standby SPE Memory.
- Requests the Standby SPE Maintenance/Tape Processor to release the Standby SPE Processor for the Standby SPE Processor to perform a RAM checksum test on Standby SPE Memory (just updated by the refresh operation).
- Waits for Standby SPE Processor to report the results of the RAM checksum test.
- Requests the Standby SPE Maintenance/Tape Processor to hold the Standby SPE Processor reset.
- Enables shadowing from Active SPE Memory to Standby SPE Memory and causes all of Active SPE Memory to be written to Standby SPE Memory (a refresh operation).

For a 386/flash based system:

- Disables shadowing from Active SPE Memory (MEM-BD) to Standby SPE Memory.
- Requests the Standby SPE Maintenance/Tape Processor (PR-MAINT) to release the Standby SPE processor (PROCR) for the Standby SPE Processor to clear a magic area in Standby SPE Memory.
- Requests the Standby SPE Maintenance/Tape Processor to hold the Standby SPE processor reset.
- Enables shadowing from Active SPE Memory to Standby SPE Memory and causes all of Active SPE Memory to be written to Standby SPE Memory (a refresh operation).
- Disables shadowing from Active SPE Memory to Standby SPE Memory.
- Requests the Standby SPE Maintenance/Tape Processor to release the Standby SPE Processor for the Standby SPE Processor to perform a verification on the magic area in Standby SPE Memory (just updated by the refresh operation).
- Requests the Standby SPE Maintenance/Tape Processor to hold the Standby SPE Processor reset.
- Enables shadowing from Active SPE Memory to Standby SPE Memory and causes all of Active SPE Memory to be written to Standby SPE Memory (a refresh operation).

NOTE:
The shadowing verification method used for 80386 systems does not do a complete RAM checksum. It only clears a special magic area in the Standby SPE's memory and then updates that area by shadowing. It then verifies the value in that magic area based on the Active SPE's value. Thus,

the test is not as comprehensive in terms of testing the memory aspect of shadowing as is the 80286 method. The reason for this is the inability to shadow flash memory.

Manager I (G1) or G3MT Message Line Errors

In addition to Shadow Link Test (#318) Error Codes, the following Manager I (G1) or G3MT message line errors may be displayed when attempting to run this test. They are:

- "Standby SPE not available; for information use status system"

  This message line error corresponds to Error Code 2020. It is displayed if the Shadow Link Test is attempted within the first five minutes of a restart of the Active SPE (that is, prior to the Active SPE holding the Standby SPE reset and refreshing it).

- "Standby SPE busy with another task; for information use status system"

  This message line error corresponds to Error Code 2018. It is displayed if the Shadow Link Test is attempted while the Active SPE is performing some Maintenance Mode activity on the Standby SPE other than system technician-demanded maintenance.

- "Cannot interrupt Standby SPE while entering maintenance mode; please try later"

  This message line error is displayed when **test shadow-link** has been issued and subsequently canceled and then **refresh spe-standby** is issued while maintenance software is in the process of performing the Shadow Link Test. Allow up to three minutes for the Shadow Link Test to complete before issuing the **refresh spe-standby** command again.

In either case, the following actions should be taken:

1. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem.
2. Repeat the command.
3. Issue the **test spe-standby long** command.

Table 11-323. TEST #318 Shadow Link Test

Error Code	Test Result	Description/ Recommendation
1029 2011 2012 2013 2014 2018 2020 2024 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2047	FAIL	The Standby SPE Maintenance/Tape Processor released the Standby SPE processor with a request to clear Standby SPE Memory; Standby SPE Memory was not successfully cleared. 1. Check for Standby SPE Processor errors and alarms. Refer to PROCR (80286 Processor Circuit Pack) Maintenance documentation and follow the prescribed procedures. 2. Check for Standby SPE Memory errors and alarms. Refer to MEM-BD (Memory) Maintenance documentation and follow the prescribed procedures. 3. If all problems found in Steps 1 and 2 have now been repaired, proceed with Step 5. If no problems were found in Steps 1 and 2, proceed with Step 4.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2047 *(cont'd.)*	FAIL	4. Issue the **display errors** command and check to see if an Error Type 58 is logged against STBY-SPE. If an Error Type 58 is logged **OR** if no error types are logged against STBY-SPE, the problem is either the Standby SPE Processor circuit pack or the Standby SPE Memory circuit pack. ■ If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has not been replaced yet, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 5, 6, and 7. If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has been replaced, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 5, 6, and 7. ■ If the red LED on the Standby SPE Memory circuit pack is on, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 5, 6, and 7. ■ If neither red LED is on **AND** if this is the first attempt to clear the problem, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 5, 6, and 7. ■ If neither red LED is on **AND** if this is the second attempt to clear the problem (that is, the Standby SPE Processor circuit pack has already been replaced), replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 5, 6, and 7. ■ If neither red LED is on **AND** if this is the third attempt to clear the problem (that is, the Standby SPE Processor and Standby SPE Memory circuit packs have already been replaced), stop here and escalate the problem.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2047 *(cont'd.)*	FAIL	5. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 6. Repeat the test. 7. Issue the **test spe-standby long** command to thoroughly test all Standby SPE components.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2048	FAIL	The Standby SPE Maintenance/Tape Processor released the Standby SPE Processor with a request to perform the RAM Checksum Test on Standby SPE Memory and the RAM checksum was determined to be incorrect. This indicates that a problem exists with one or more components that make up the Memory Shadowing Link such that Active SPE Memory was not accurately shadowed to Standby SPE Memory. 1. Check for both Active SPE and Standby SPE Common Shadow Circuit errors and alarms. Refer to SHDW-CIR (Common Shadow Circuit) Maintenance documentation and follow the prescribed procedures. 2. Check for Standby SPE Memory errors and alarms. Refer to MEM-BD (Memory) Maintenance documentation and follow the prescribed procedures. 3. Check the Inter-Carrier Cable to see if it is loose or disconnected. If so, follow the repair procedures for reconnecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 4. If all problems found in Steps 1, 2, or 3 have now been repaired, proceed with Step 9. If no problems were found in Steps 1, 2, or 3, proceed with Step 5. 5. Issue the **display errors** command and check to see if an Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2048 *(cont'd.)*	FAIL	6. Issue the **display errors** command and check to see if an Error Type 82 is logged against STBY-SPE. If so, the problem is the carrier B Duplication Interface circuit pack. Replace the carrier B Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. 7. Issue the **display errors** command and check to see if an Error Type 85 is logged against STBY-SPE. If so, the problem may be the Standby SPE Memory circuit pack. Replace the Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2048 *(cont'd.)*	FAIL	8. Issue the **display errors** command and check to see if an Error Type 58 is logged against STBY-SPE. If an Error Type 58 is logged **OR** if no error types are logged against STBY-SPE, the problem is either the Standby SPE Processor circuit pack, or the Standby SPE Memory circuit pack, or the carrier B Duplication-Interface circuit pack, or the carrier A Duplication-Interface circuit pack. ■ If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has not been replaced yet, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has been replaced, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Standby SPE Memory circuit pack is on, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Standby SPE Duplication Interface circuit pack is on, replace the Standby SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Active SPE Duplication Interface circuit pack is on, replace the Active SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2048 *(cont'd.)*	FAIL	Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" to understand how to correctly replace the Duplication-Interface circuit pack. ■ If none of the four red LEDs are on **AND** if this is the first attempt to clear the problem, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are on **AND** if this is the second attempt to clear the problem (that is, the Standby SPE Processor circuit pack has already been replaced), replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are on **AND** if this is the third attempt to clear the problem (that is, the Standby SPE Processor and Standby SPE Memory circuit packs have already been replaced), replace the Standby SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are on **AND** if this is the fourth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and Standby SPE Duplication Interface circuit packs have already been replaced), replace the Active SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. **NOTE:** The Duplication Interface circuit pack must be made to reside in the Standby SPE before it can be replaced.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2048 *(cont'd.)*	FAIL	Refer to Chapter 8, "Reliability Systems: A Maintenance Aid" to understand how to correctly replace the Duplication-Interface circuit pack. ■ If none of the four red LEDs are on **AND** if this is the fifth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and both Duplication Interface circuit packs have already been replaced), stop here and escalate the problem. 9. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 10. Repeat the test. 11. Issue the **test spe-standby long** command to thoroughly test all Standby SPE components.

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Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2049	FAIL	The Standby SPE Maintenance/Tape Processor released the Standby SPE processor with a request to perform the RAM Checksum Test on Standby SPE Memory. The RAM checksum was correct; however, a significant discrepancy was detected between two special Standby SPE Memory locations that should contain the same time stamp value as the one shadowed over from the Active SPE. This indicates that a problem exists with one or more components that make up the Memory Shadowing Link such that Active SPE Memory was not accurately shadowed to Standby SPE Memory. 1. Check for both Active SPE and Standby SPE Common Shadow Circuit errors and alarms. Refer to SHDW-CIR (Common Shadow Circuit) Maintenance documentation and follow the prescribed procedures. 2. Check for Standby SPE Memory errors and alarms. Refer to MEM-BD (Memory) Maintenance documentation and follow the prescribed procedures. 3. Check the Inter-Carrier Cable to see if it is loose or disconnected. Also if intermittent problems are occurring inspect the Inter-Carrier Cable for cuts or broken leads. If so, follow the repair procedures for reconnecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 4. If all problems found in Steps 1, 2, or 3 have now been repaired, proceed with Step 9. If no problems were found in Steps 1, 2, or 3, proceed with Step 5. 5. Issue the **display errors** command and check to see if an Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11.

Continued on next page

Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2049 *(cont'd.)*	FAIL	6. Issue the **display errors** command and check to see if an Error Type 82 is logged against STBY-SPE. If so, the problem is the carrier B Duplication Interface circuit pack. Replace the carrier B Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. 7. Issue the **display errors** command and check to see if an Error Type 85 is logged against STBY-SPE. If so, the problem may be the Standby SPE Memory circuit pack. Replace the Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11.

Continued on next page

Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2049	FAIL *(cont'd.)*	8. Issue the **display errors** command and check to see if an Error Type 58 is logged against STBY-SPE. If an Error Type 58 is logged **OR** if no error types are logged against STBY-SPE, the problem is either the Standby SPE Processor circuit pack, or the Standby SPE Memory circuit pack, or the carrier B Duplication-Interface circuit pack, or the carrier A Duplication-Interface circuit pack. ■ If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has not been replaced yet, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has been replaced, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Standby SPE Memory circuit pack is lit, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Standby SPE Duplication Interface circuit pack is lit, replace the Standby SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If the red LED on the Active SPE Duplication Interface circuit pack is lit, replace the Active SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. **NOTE:** The Duplication Interface circuit pack must be made to reside in the Standby SPE before it can be replaced.

Continued on next page

Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2049 *(cont'd.)*	FAIL	Refer to the "Replacing Defective SPE Circuit Packs" section in Chapter 8, "Reliability Systems: A Maintenance Aid" to understand how to correctly replace the Duplication-Interface circuit pack. ■ If none of the four red LEDs are lit **AND** if this is the first attempt to clear the problem, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are lit **AND** if this is the second attempt to clear the problem (that is, the Standby SPE Processor circuit pack has already been replaced), replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are lit **AND** if this is the third attempt to clear the problem (that is, the Standby SPE Processor and Standby SPE Memory circuit packs have already been replaced), replace the Standby SPE Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. ■ If none of the four red LEDs are lit **AND** if this is the fourth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and Standby SPE Duplication Interface circuit packs have already been replaced), replace the Active SPE Duplication Interface circuit pack as described in Chapter 8, 'Reliability Systems: A Maintenance Aid" and proceed with Steps 9, 10, and 11. **NOTE:** The Duplication Interface circuit pack must be made to reside in the Standby SPE before it can be replaced.

Continued on next page

Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2049 *(cont'd.)*	FAIL	Refer to the "Replacing Defective SPE Circuit Packs" section in Chapter 8, "Reliability Systems: A Maintenance Aid" to understand how to correctly replace the Duplication-Interface circuit pack. ■ If none of the four red LEDs are lit **AND** if this is the fifth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and both Duplication Interface circuit packs have already been replaced), stop here and escalate the problem. 9. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 10. Repeat the test. 11. Issue the **test spe-standby long** command to thoroughly test all Standby SPE components.

Continued on next page

Table 11-323. TEST #318 Shadow Link Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2050	FAIL	The Standby SPE Maintenance/Tape Processor released the Standby SPE Processor with a request to perform the RAM Checksum Test on Standby SPE Memory. The RAM checksum was correct and the two special Standby SPE Memory locations contain the same time stamp value as the one shadowed over from the Active SPE; however, that time stamp value is significantly different from the value of the Standby SPE's Time-of-Day clock. This indicates that either the Active SPE Time-of-Day clock has never been set (for example, at system installation time) or that the Active SPE Time-of-Day clock was set (with a significant change) while shadowing to the Standby SPE was disabled. 1. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 2. Issue the **set time** command and set the Time-of-Day clock. 3. Repeat the test.
	PASS	When the Shadow Link Test passes, the integrity of the Memory Shadowing Link has been verified and as long as memory shadowing is enabled, Standby SPE Memory is an up-to-date reflection of Active SPE Memory. This test also provides a positive indication of the functionality of Active SPE Memory, both sets of Common Shadow Circuit, and Standby SPE Memory.

SPE-SELEC (SPE Select Switch)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
SPE-SELEC	MAJOR	test duplication-interface 1C sh	SPE Select Switch
SPE-SELEC	WARNING	test duplication-interface 1C sh	SPE Select Switch

1 Where C is the carrier determined by the Port field in the error or alarm log.

The SPE Select Switch MO tracks the state of the SPE Select Switches in a High or Critical Reliability system. The switches are located on the Duplication Interface circuit pack and can be used to hard-select the active processor in a High or Critical Reliability system. Each switch has three positions: SPE-A (the left position), AUTO (the middle position), and SPE-B (the right position). To hard-select SPE-A, both switches must be in the SPE-A position. To hard-select SPE-B, both switches must be in the SPE-B position. Any other combination of SPE Select Switches leaves control of the active SPE to the software. Whenever a switch is out of the AUTO position, a Warning alarm is raised. If both switches are out of the AUTO position for six hours, a Major alarm is raised. Duplication Interface circuit pack B reports the state of the SPE-SELEC Switch B to Duplication Interface circuit pack A which, in turn, reports the state of SPE-SELEC Switch A directly to the system software.

NOTE:
Each switch is a separate MO. If both switches are out of the AUTO position, then both switches are alarmed.

It is also possible to get an "init cause" of the SPE-SELEC Switch if SPE B is active and power to carrier B is lost. In this case, an SPE switch to SPE A occurs, and the "init cause" shows either "SPE-Select Switch" or "SPE-Down."

Hardware Error Log Entries and Test to Clear Values

SPE Select Switch Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test duplication-interface 1C sh r 1
1	Any	SPE Select Query Test (#278)	WARNING/ MAJOR[2]	OFF	test duplication-interface 1C sh r
257	any	SPE Select Query Test (#278)	WARNING/ MAJOR[2]	OFF	test duplication-interface 1C sh r 2

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This error type initially raises a Warning alarm. If this error type persists and alarms are not downgraded on this MO due to the values of **set options**, then, after a period of time, a Major alarm is raised.

Notes:

a. The Warning alarm is upgraded to Major if the error is not resolved in six hours.

b. Determine the carrier (a or b) by the Port field in the Error or Alarm Log. For SPE-SELEC, the Port field is 1A (**test duplication interface a**) or 1B (**test duplication interface b**).

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Duplication Interface Circuit Pack Status Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Duplication Interface Circuit Pack Status Query Test (#315) (a)	X	X	ND
Duplication Interface Circuit Pack Sanity Circuit Test (#273) (a)		X	D
Duplication Interface Circuit Pack Sanity Maze Test (#277) (a)	X	X	ND
Duplication Interface Circuit Pack SPE A Loop Back Test (#275) (a)	X	X	ND
Duplication Interface Circuit Pack SPE B Loop Back Test (#276) (a)	X	X	ND
Duplication Interface Circuit Pack Manager I Loop Back Test (#274) (a)	X	X	ND
Inter-Duplication Interface Circuit Pack Loop Back Test (#280)	X	X	ND
Duplication Interface Circuit Pack Background Test Query Test (#271) (a)	X	X	ND
Duplication Interface Circuit Pack Invalid Message Query Test (#272) (a)	X	X	ND
Common Shadow Circuit M-BUS Time-out Query Test (#285) (b)		X	ND
Common Shadow Circuit Loop Back Test (#283) (b)	X	X	ND
Common Shadow Circuit Address Decoder Test (#284) (b)	X	X	ND
SPE Select Switch Query Test (#278)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to the DUPINT (Duplication Interface Circuit Pack) Maintenance documentation for description of this test.

b. Refer to the SHDW-CIR (Common Shadow Circuit) Maintenance documentation for description of this test.

SPE Select Query Test (#278)

This test queries the Duplication Interface circuit pack for the state of SPE Select Switch. The test passes if the switch is in the AUTO position. The test fails if the switch is not in the AUTO position or if the Duplication Interface circuit pack is not present.

Table 11-324. TEST #278 SPE Select Query Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The switch currently selects SPE-A active.
2	FAIL	The switch currently selects SPE-B active. 1. Move the switch to the AUTO position. 2. Rerun the test. If the test still fails, follow normal escalation procedures.

Continued on next page

Table 11-324. TEST #278 SPE Select Query Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	The Duplication Interface circuit pack is not present or not functioning. 1. Resolve all alarms logged against the Duplication Interface circuit pack (DUPINT). 2. Rerun the test. If the test still fails, follow normal escalation procedures.
	PASS	The Duplication Interface circuit pack has reported that the SPE Select Switch is in the AUTO position. 1. If a visual inspection shows the SPE Select Switch is not in the AUTO position, then resolve all alarms logged against Duplication Interface circuit pack (DUPINT). 2. Repeat the test. 3. If Duplication Interface circuit pack B is being tested and a visual inspection shows that the switch is not in the normal position, Duplication Interface circuit pack A may be incorrectly reporting the state of SPE-Select Switch B. Replace Duplication Interface circuit pack A, and rerun the test.

STBY-SPE (Standby SPE)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
STBY-SPE	WARNING	status system 1	Standby SPE
STBY-SPE	MAJOR	test spe-standby	Standby SPE

A High or Critical Reliability system contains two switch processing elements (SPEs). The first such element is known as the Active SPE. The Active SPE is currently responsible for all call processing, administration, and maintenance activities that are being performed by the system. The other SPE is known as the Standby SPE. The Standby SPE becomes the Active SPE whenever the current Active SPE fails. The Standby SPE does not perform call processing or administration activities. However, it does perform maintenance activities, but these activities are carried out completely under the direction of the Active SPE in order to monitor and maintain the health of the Standby SPE.

NOTE:
Verify that the Standby SPE is functional (no duplication alarms exist and the SPE has returned to the Standby Mode) by running the **status system 1** command. If the standby SPE is in the maint/idle mode with no standby alarms, use the **standby refresh** command to put the standby SPE into the standby mode. Verify the results by using the **status system 1** command. For more information about the **status system** command see Chapter 10 .

NOTE:
Only G3V1 (TN773), G3V2-386 (TN786B), G3iV5 (TN790), and later configurations supports High or Critical Reliability.

The Standby SPE is always in one of three modes: Standby, Maintenance, or Down. Usually, the Standby SPE is in Standby Mode. In this mode,

1. The Switch Control (SW-CTL) on the Standby SPE Network Control circuit pack is isolated from the TDM Bus so that it does not interfere with attempts by the Switch Control on the Active SPE Network Control circuit pack to control the TDM Bus
2. The Standby SPE (PKT-CTRL) Packet Control circuit pack is isolated from the Packet Bus to prevent interference with the activity on the Active SPE Packet Control circuit pack
3. The Standby SPE (PROCR) Processor is held in a reset state so that it does not run software
4. For G3iV2-386, the 12 volt power supply on the Standby SPE Network Control circuit pack (TN777B) can not be turned on when the Standby SPE Processor is held in the reset state

5. Standby SPE Memory (MEM-BD in G3iV1.1-286 or MEMORY in a G3iV2-386) is shadowed from Active SPE Memory. This means that Standby SPE Memory is updated to reflect every change in Active SPE Memory (for example, calls and administration changes). In G3iV2-386, the system memory consists of two types of memory: flash ROM for system boot image and initialized data, and DRAM for system read/write data. Only the DRAM portion in the Active SPE can be shadowed to the Standby SPE DRAM memory. In Standby Mode, the Standby SPE is available to assume the role of the Active SPE.

In certain circumstances, the Standby SPE is put into Maintenance Mode by the Active SPE. In this mode, the SW-CTL and PKT-CTRL on the Standby SPE are still isolated from the TDM Bus and Packet Bus, memory shadowing is disabled, and its processor is no longer held in a reset state. Data Channels on the standby SPE Network Control circuit pack can access the TDM bus, and the maintenance testing can be executed in this maintenance mode. The 12 volt power supply on the standby SPE Network Control circuit pack can also be turned on for Memory Card maintenance testing. In Maintenance Mode, the Standby SPE accepts maintenance activity requests from the Active SPE to perform testing on Standby SPE components. For many of the requested activities, maintenance software on the Standby SPE is restarted in order to conduct the activity. Translation saves and announcement saves may be performed on the Standby SPE when it is in Maintenance Mode. While in Maintenance Mode, the Standby SPE is not as readily available to assume the role of the Active SPE, but it may do so depending upon the severity of the Active SPE fault(s).

Whenever the Standby SPE is returned to Standby Mode from Maintenance Mode, its DRAM Memory is refreshed. This means that the Active SPE DRAM Memory is shadowed over to Standby SPE DRAM Memory. In G3iV2-386, the flash ROM memory in the Standby SPE is not refreshed, and the shadowing circuit cannot write data into the flash ROM memory. The refresh is necessary because, while in Maintenance Mode, memory shadowing to the Standby SPE is disabled and Standby SPE Memory is not updated to reflect changes in Active SPE Memory. After the refresh, Standby SPE Memory once again is an up-to-date reflection of Active SPE Memory.

The Standby SPE goes into Down Mode whenever certain error conditions are detected. These error conditions are described in detail in the "Hardware Error Log Entries and Test to Clear Values" section. Once the error condition(s) that cause(s) the Standby SPE to go into Down Mode are corrected, the Standby SPE is first put into Maintenance Mode to conduct testing on Standby SPE components. It is then returned to Standby Mode.

The current mode of the Standby SPE can be determined by issuing the **status system** command.

Components in Standby SPE Complex

The Standby SPE Maintenance Object is actually a composite of all the circuit packs in the Standby SPE. For G3iV1.1-286, these include the TN773 Processor circuit pack, the TN770 Memory circuit pack, the TN777 Network Control circuit pack, the TN774 Tape Unit, the TN778 Packet Control circuit pack, the TN765 Processor Interface circuit pack(s), and the TN772 Duplication Interface circuit pack. When located in the Standby SPE, all of these components are tested under the guide of the STBY-SPE maintenance object.

However, for G3iV2-386, the SPE complex requires a different set of circuit packs, including The TN786B Processor and the CPP1 Memory circuit pack, or the TN790 circuit pack, and the TN777B Network Control circuit pack with memory card. No Tape Unit is required for 386 configurations. The other circuit packs mentioned for G3iV1.1-286, including the TN778 Packet Control circuit pack, the TN765 Processor Interface circuit pack(s), and the TN772 Duplication Interface circuit pack are still used in G3iV2-386.

WARNING:

Verify that there is an identical set of SPE complex circuit packs in each SPE. For example, there should be the same number of Memory circuit pack(s) in each SPE. If there are Processor Interface circuit pack(s) (one or two) in the Active SPE, the same number of PI circuit packs must be present in the Standby SPE. If one SPE has a Packet Control Circuit Pack, the other SPE must also have one. If the set of circuit packs in each SPE is not identical, alarms could result against the STBY-SPE, DUPINT, SHDW-CIR, PI-BD, PKT-CTRL, PROCR, MEM-BD and MEMORY maintenance objects.

The accessing and testing of the Standby SPE may be affected by the health of the circuit packs through which the Active SPE communicates with the Standby SPE. These circuit packs include the Active SPE Processor circuit pack, the Duplication Interface circuit pack in the A carrier, and the Standby SPE Processor circuit pack. Additionally, the Inter-Carrier Cable (ICC) and the backplane affect the ability of the Active SPE to communicate with the Standby SPE. The ability to shadow Active SPE memory into Standby SPE memory is affected by the Duplication Interface circuit pack in the A carrier, the Duplication Interface circuit pack in the B carrier, and the Memory circuit pack(s) in the Standby SPE. Additionally, the Active SPE Memory Bus, the ICC, backplane, and the Standby SPE Memory Bus affect the ability to correctly shadow Active SPE memory into Standby SPE memory.

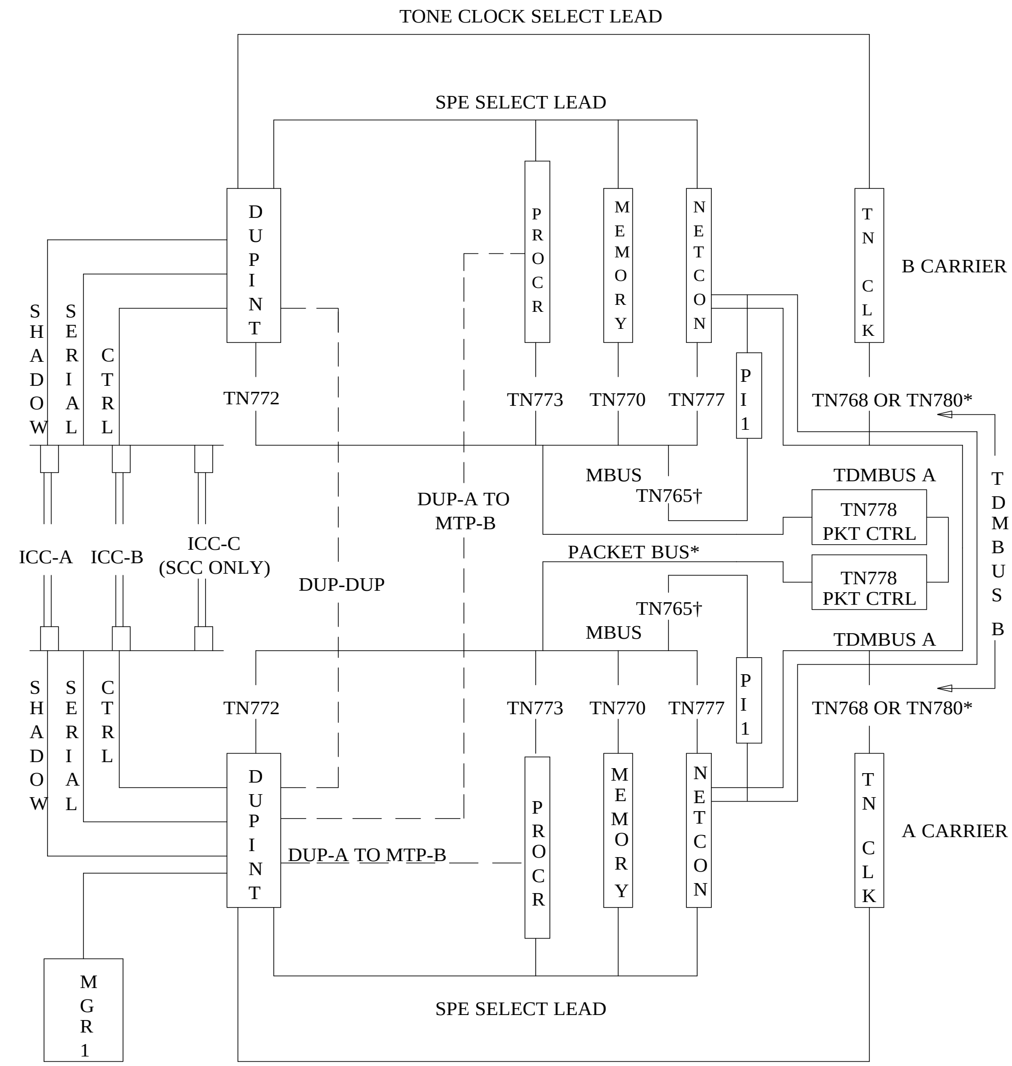
These dependencies can be seen in Figure 11-93 for G3iV1.1-286 and in Figure 11-94 for the G3iV2-386 or the TN790. These figures depict the interconnection between the two SPEs of a High or Critical Reliability system. The following abbreviations are used in the figures:

- DUPINT for Duplication Interface circuit pack
- PROCR/MEM for TN786B or TN790 Processor Circuit Packs with Memory

- PROCR for Processor Circuit Pack
- MEMORY for Memory Circuit Pack(s)
- MTP for Maintenance Processor in Processor Circuit Pack
- NETCON for Network Control Circuit Pack
- MEM CARD for Memory Card Plugged in the Network Control Circuit Pack
- PI for Processor Interface Circuit Pack(s)
- PKT CTRL for Packet Control Circuit Pack
- TN CLK for Tone-Clock Circuit Pack
- MGR *I for Manager I Terminal
- TDM BUS for Time Division Multiplex Bus
- PACKET BUS for Packet Bus
- M-BUS for Memory Bus
- ICC for Inter-Carrier Cable
- SCC for Single-Carrier Cabinet

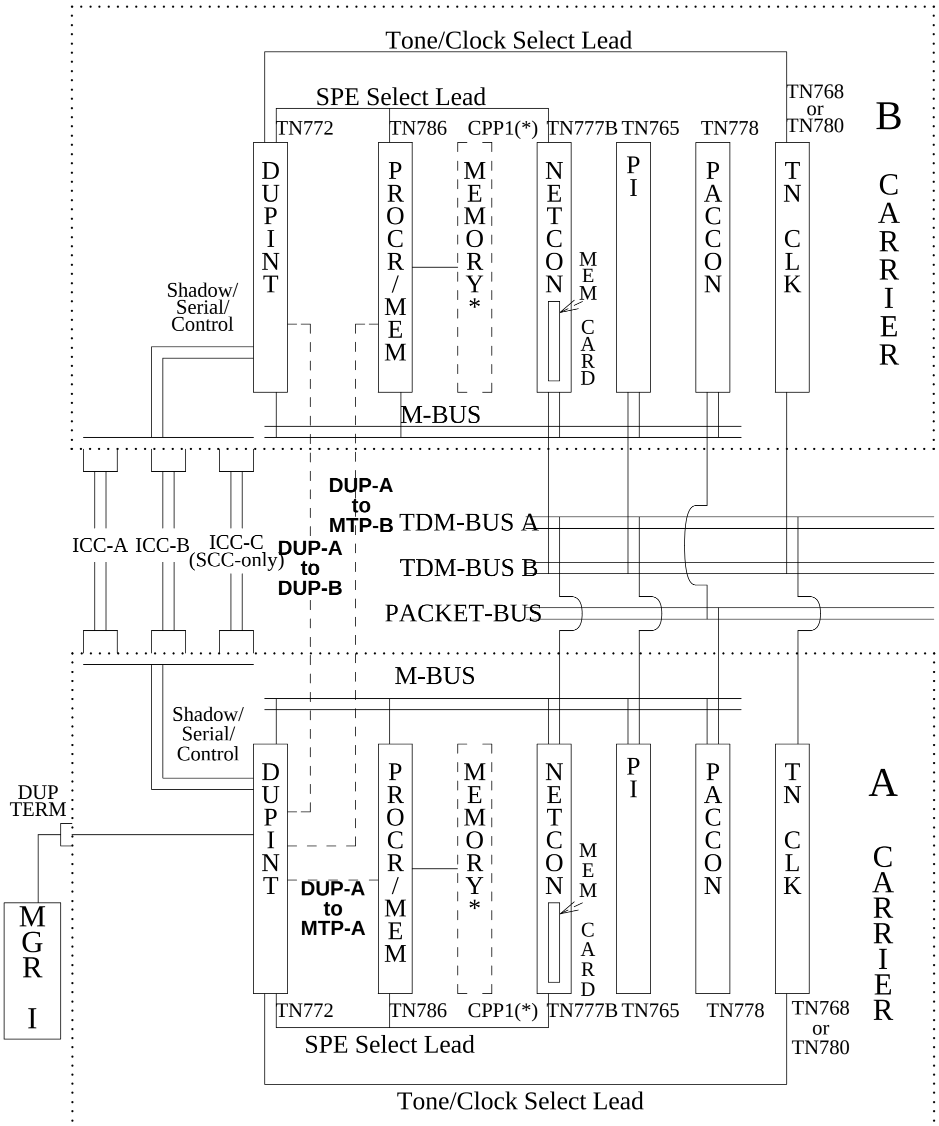
The dashed lines in the figure represent important logical connections between components.

Refer to the DUPINT, SHDW-CIR, MEM-BD, MEMORY, PROCR, PR-MAINT, TDM-BUS, PKT-BUS, TDM-CLK, PI-BD, PI-SCI, PKT-CTRL, SW-CTL, DATA-CHL, 12V-PWR, CARD-MEM and STBY-SPE Maintenance documentation for more detailed descriptions of the individual components.



* G1.2 ONLY.
† MCC ONLY.
(IN A SINGLE-CARRIER CABINET CONFIGURATION, THERE CAN BE EITHER 0 OR 1 PROCESSOR INTERFACE CIRCUIT PACK. IN A MULTICARRIER CABINET CONFIGURATION, THERE CAN BE 0, 1, OR 2 PROCESSOR INTERFACE CIRCUIT PACKS.)

Figure 11-93. STBY-SPE Interactions for a Duplex G3iV1.1-286 System



(*) G3iV2-386 System Only

Figure 11-94. STBY-SPE Interactions for a Duplex G3iV2-386 System

Hardware Error Log Entries and Test to Clear Values

Table 11-325. Standby SPE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test spe-standby l See note (n).
1(a)	0 2014 2016 2017 2022 2024 2025	Inability to Do Standby SPE Maintenance Activity	MAJOR	ON	test spe-standby sh See note (n).
18	any	Standby SPE busied out	WARNING	OFF	release spe-standby
58 (b)	Any	Standby SPE in Down Mode			test processor [[0]1] a | b sh See note (n).
67 (c)	Any	Memory Shadowing Link Failure Detected			test shadow-link See note (n).
80 (d)	Any	Handshake Loss With Carrier A Dupint			test duplication-interface a sh test duplication-interface b sh See note (n).
81 (e)	Any	Handshake Loss With Standby SPE Processor			test duplication-interface a sh test duplication-interface b sh See note (n).
8 (f)	Any	Handshake Loss Between Dupints			test duplication-interface a sh test duplication-interface b sh See note (n).
85 (g)	Any	Timeouts Detected While Shadowing			test duplication-interface a l test duplication-interface b l See note (n).
98 (h)	Any	Active SPEMTP DPR Failure Detected			test processor [[0]1] a | b sh See note (n).
99 (i)	Any	Active SPEMTP Insanity Detected			test processor [[0]1] a | b sh See note (n).

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Table 11-325. Standby SPE Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
106 (j)	Any	Standby SPE Memory Failure Detected			test memory [[0]1] a | b l See note (n).
139	Any	See note (k).			See note (k).
149 (l)	any	See note (l).			refresh spe-standby See note (n)
257 (n)	0 2014 2015 2017 2021 2024 2048 2049 2050 2051 2054	Standby SPE Not Put Into Standby Mode	Major	ON	refresh spe-standby (See note (n).
801 (o)	any	No response from Standby SPE after upgrade	MAJOR	ON	upgrade software
802 (p)	any	Checksum on Standby SPE failed after upgrade	MAJOR	ON	upgrade software
803 (q)	any	No translation card-mem inserted after Standby SPE upgrade	MAJOR	OFF	upgrade software
804 (r)	any	Lost communication with Standby SPE during reboot following upgrade	MAJOR	ON	upgrade software
805 (s)	any	No software mem-card inserted in active SPE	MAJOR	OFF	upgrade software
806 (t)	any	Checksum on new Standby SPE failed	MAJOR	ON	upgrade software

Continued on next page

Table 11-325. Standby SPE Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
807 (u)	any	No translation mem-card inserted in new Standby SPE	MAJOR	OFF	
808 (v)	any	Lost communication with new Standby SPE	MAJOR	ON	upgrade software
809 (w)	any	Failed to perform SPE-interchange	MAJOR	OFF	upgrade software
810 (x)	any	Bad checksum on software mem-card	MAJOR	OFF	upgrade software
812 (y)	any	SPE interchanged forced with health-override option:	WARNING	OFF	See note (y).
822(z)	any	A non-hot interchange to the standby SPE occurred.			See note (z).
826 (aa)	any	Standby software mismatch	MAJOR	ON	upgrade software

1 Run the short test sequence first. If all the tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

It is important to note that when more than one of the above error types exists at the same time, the alarm against the Standby SPE is cleared only when (1) any problems described by the Aux Data values for Error Types 1 and 257 are resolved **and** (2) all problems described in (b) through (o) are resolved.

Notes:

a. Aux Data value 0 is equivalent to Aux Data value 2017. All Aux Data values listed for Error Type 1 are described in "System Technician-Demanded Tests: Test Result Error Codes". These values are shared between Standby SPE maintenance activity results and the test results for the System Technician commands on Standby SPE components because the values represent the common set of problems that can be encountered when attempting to conduct any form of maintenance activity on the Standby SPE.

b. Error Type 58 is logged when the Duplication Interface circuit pack in the A carrier reports that the Standby SPE has gone into Down Mode. This implies an inability to communicate with the Standby SPE.

   The ability to communicate with the Standby SPE should be checked by issuing the **test processor a | b short** command, where "a | b" indicates the carrier that contains the Standby SPE. If all of the tests execute such that no test returns an Aux Data value of 2014, 2015, 2016, 2017, 2022, 2024, or 2025, the Standby SPE was successfully put into Maintenance Mode. This indicates that the communication path between the Active SPE and the Standby SPE may be functional. However, to restore the functionality of the communication path, look for the presence of Error Types 80, 81, and 106 and use the recommended commands to clear these errors.

c. Error Type 67 is logged when the Shadow Link Test (#318) fails. This implies that the shadowing mechanism is not functioning.

   The functionality of the Memory Shadowing Link should be checked by issuing the **test shadow-link** command. If the test passes, the memory shadowing mechanism may be functional. However, to restore the memory shadowing, look for the presence of Error Types 82, 85, and 106 and use the recommended commands to clear these errors.

d. Error Type 80 is logged when the Active SPE Maintenance/Tape Processor reports that the handshake that is maintained between the processor and the Duplication Interface circuit pack in the A carrier has been lost. This implies an inability to communicate with the Standby SPE.

   The status of the handshakes should be checked by issuing the **test duplication-interface a** and the **test duplication-interface b** commands. These commands initiate background tests that verify whether the handshake between Dupint-A and Active-MTP is operational.

   If the handshake between Dupint-A and Active-MTP is operational, the communication path between the Active SPE and the Standby SPE may be functional. However, to restore the communication path, look for the presence of Error Types 58, 81, 82, 98, 99, and 106 and use the recommended commands to clear these errors.

e. Error Type 81 is logged when the Duplication Interface circuit pack in the A carrier reports that the handshake that is maintained between the circuit pack and the Maintenance/Tape Processor on the Standby SPE has been lost. This implies an inability to communicate with the Standby SPE.

   The status of the handshakes should be checked by issuing the **test duplication-interface a** and the **test duplication-interface b** commands. These commands initiate background tests that verify whether the handshake between Dupint-A and Standby-MTP is operational.

If the handshake between Dupint-A and Standby-MTP is operational, the communication path between the Active SPE and the Standby SPE may be functional. However, to restore the communication path, look for the presence of Error Types 58, 80, 82, 98, 99, and 106 and use the recommended commands to clear these errors.

f. Error Type 82 is logged when the Duplication Interface circuit pack in the A carrier reports that the handshake that is maintained between the circuit pack and the Duplication Interface circuit pack in carrier B has been lost. This implies that the shadowing mechanism is not functioning.

   The status of the handshakes should be checked by issuing the **test duplication-interface a** and the **test duplication-interface b** commands. These commands initiate background tests that verify whether the handshake between Dupint-A and Dupint-B is operational. If the handshake between Dupint-A and Dupint-B is operational, the memory shadowing mechanism may be functional. However, to restore the memory shadowing, look for the presence of Error Types 67, 85, and 106 and use the recommended commands to clear these errors.

   NOTE:
   Because the handshake between Dupint-A and Dupint-B is tested in the background, the test results from executing the **test duplication-interface a** command do not indicate their current status. However, if the background testing determines that all three handshakes (that is, Dupint-A to Dupint-B, Dupint-A to Active-MTP, and Dupint-A to Standby-MTP) have become operational, and if there are no other current STBY-SPE errors, Error Types 80, 81, and 82 and the associated STBY-SPE alarm will be cleared in about 30 minutes.

g. Error Type 85 is logged when the Duplication Interface circuit pack detects that writes made to the Standby SPE Memory are not being acknowledged. This implies that the shadowing mechanism is not functioning.

   The presence of time-outs when shadowing to the Standby SPE Memory should be checked by issuing the **test duplication-interface a long** command. This command runs a test that forces memory writes to the Standby SPE Memory and detects time-outs waiting for acknowledgments. If time-outs are not detected, memory shadowing may be functional. However, to restore the functionality of memory shadowing, look for the presence of Error Types 67, 82, and 106 and use the recommended commands to clear these errors.

h. Error Type 98 is logged when the Active SPEMTP Dual Port RAM Test (#104) fails. This implies an inability to communicate with the Active MTP.

   The ability to communicate with the Active MTP should be checked by issuing the **test processor a | b short** command, where "a | b" indicates the carrier that contains the Active SPE.

i. Error Type 99 is logged when the Active SPE detects that the handshake that is maintained between the Active SPE Processor and the Active SPE Maintenance/Tape Processor has been lost. This implies an inability to communicate with the Active MTP.

   The ability to communicate with the Active MTP should be checked by issuing the **test processor a | b short** command, where "a | b" indicates the carrier that contains the Active SPE.

j. Error Type 106 is logged when the Standby SPE Memory Functional Test (#332) fails. This implies an inability to communicate with the Standby SPE and also that the shadowing mechanism is not functioning.

   The functionality of the Standby SPE Memory should be checked by issuing the **test memory a | b long** command, where "a | b" indicates the carrier that contains the Standby SPE. This command runs the Memory Functional Test. If the test passes, the communication path between the Active SPE and the Standby SPE may be functional. However, to restore the functionality of the communication path, look for the presence of Error Types 58, 80, 81, 98, and 99 and use the recommended commands to resolve these errors.

   Additionally, if the Memory Functional Test passes, the memory shadowing mechanism may be functional. However, to restore the functionality of memory shadowing, look for the presence of Error Types 67, 82, and 85 and use the recommended commands to resolve these errors.

k. If Error Type 139 is present, this error type takes precedence over all other error types until it is resolved. This error type indicates an incompatibility between the two Processor circuit packs in a High or Critical Reliability system. For a High or Critical Reliability system to work, the two Processor circuit packs must function together so that the circuit packs can perform interchanges between themselves.

   Use the following procedure to resolve this error:

   1. Set the SPE-Select switches one at a time to select the Active SPE. This also forces the Tone-Clock in this SPE to become active.
   2. If the active SPE is the B carrier, issue the **test duplication-interface a long** command.
   3. Execute the **test spe-standby long** command.
   4. Use the **display error** command with the "dup-spe" category to see if the Error Code 139 recurred. If the error did not recur, and if all STBY-SPE tests have passed, the system is functioning normally.
   5. Restore the SPE-Select switches to normal.
   6. If Error Code 139 still exists (and if the STBY-SPE tests have failed), one of the Processor circuit packs must be replaced. The system will function normally, but it will not be able to interchange properly to the Standby SPE without service disruption. Replacing the Standby processor is the best solution to this problem. However, the processor must be replaced with one of a vintage that is

compatible with the current Active Processor. (Refer to the "Circuit Pack Replacement Procedure" section in Chapter 8, "Reliability Systems: A Maintenance Aid".)

However, if it is found that the Active processor must be replaced (for example, the Standby processor is of a newer vintage), the repair strategy is more complex. Use the following procedure to replace the Active Processor circuit pack:

NOTE:
Replacing the Active Processor circuit pack will disrupt service. Schedule this procedure at the customer's convenience.

1. Set the SPE-Select switches one at a time to select the Standby SPE. An SPE-interchange with a reset level of 3 or 4 results.
2. Replace the new Standby (and former Active) SPE Processor circuit pack with a circuit pack of the appropriate vintage. (Refer to the "Circuit Pack Replacement Procedure" section in Chapter 8, "Reliability Systems: A Maintenance Aid".)
3. Issue the **test spe-standby long** command. Use the **display error** command with the "dup-spe" category to verify that all tests pass and that Error Type 139 does not recur.
4. Restore the SPE-Select switches to their normal position.

l. Error Type 149 occurs when the Standby SPE goes into down mode during system technician demanded testing. Wait three minutes, then look for other STBY-SPE errors and follow the procedures described for these errors.

m. Aux Data value 0 is equivalent to Aux Data value 2017. Aux Data values 2014, 2015, 2017, 2021, 2024, and 2051 for Error Type 257 are described in the "System Technician-Demanded Tests: Test Result Error Codes". The Aux Data values 2048, 2049, and 2050 for Error Type 257 are described in SHDW-LNK (Memory Shadowing Link) Maintenance documentation. These values are shared between Standby SPE maintenance activity results and the test results for System Technician commands on Standby SPE components because the values represent the common set of problems that can be encountered when attempting to conduct any form of maintenance activity on the Standby SPE.

Error Type 257 with an Aux Data value of 2051 and a Major alarm results when, in attempting to refresh the Standby SPE, it is determined that software cannot communicate with the Duplication Interface circuit pack in the A carrier. This implies that the shadowing mechanism is not functioning. This error type is accompanied by Error Type 80.

Error Type 257 with an Aux Data value of 2051 and no alarm results when, in attempting to refresh the Standby SPE, it is determined that software cannot communicate with the Duplication Interface circuit pack in the B carrier. This does not necessarily imply that the shadowing mechanism is not functioning, but it **is** possible that it is not functioning. This error type is accompanied by Error Type 82. However, Error Type 82 may not be logged until sometime later.

n. After issuing the specified command(s) to clear this alarm, perform the following procedure to clear the STBY-SPE alarm:

   1. If all the tests pass or abort, issue a **refresh spe-standby** command. If the refresh is successful, wait one minute and then check for alarms against STBY-SPE. If the refresh was not successful, or if there are still alarms against STBY-SPE, continue attempts to resolve other STBY-SPE error types. The **busyout spe-standby** and **release spe-standby** commands may also be used to clear out STBY-SPE alarms. After entering the **busyout spe-standby** command followed by the **release spe-standby** command, all STBY-SPE alarms are retired and, one minute later, the equivalent of scheduled maintenance is run on the standby SPE. Note that the **busyout spe-standby** and **release spe-standby** commands do not affect alarms on other Maintenance Objects in the standby processor complex.
   2. If some of the tests fail, refer to the appropriate MO section and follow the procedures described there.

The following table summarizes the error types that may affect the functionalities of the Communication Path to the Standby SPE and of Memory Shadowing. To restore the function, all error types that may affect the function must be investigated and resolved by following the recommended commands or procedures.

Function Affected	Error Types
Communication Path To Standby SPE	58, 80, 81, 98, 99, 106, 1 with Aux Data values 2016, 2017, 2022, 2024, or 2025; 139 with Aux Data value 2015.
Memory Shadowing	67, 82, 85, 106, 257 with Aux Data values 2014, 2015, 2021, 2024, 2048, 2049, 2050, or 2051.

o. Error Type 801 (80386 only) is logged when the **upgrade software** command failed due to the loss of communication with the Standby SPE during the upgrade. This implies that the software reprogramming of the Standby SPE never completed.

   The **upgrade software** command should be re-executed. If it fails again, the Standby SPE Processor circuit pack should be replaced.

p. Error Type 802 (80386 only) is logged when the **upgrade software** command failed due to the bad flash checksum on the Standby SPE after the completion of the upgrade. This implies that the on-board flash memory may not be functional. The Standby SPE is running the new software while the Active SPE is still running the old software. However, due to the bad flash checksum, the behavior of the Standby SPE may be unpredictable.

The **upgrade software** command should be re-executed. If the command fails again, the Standby SPE Processor circuit pack should be replaced.

q. Error Type 803 (80386 only) is logged when the **upgrade software** command failed due to the failure to insert the translation card-mem into the Standby SPE in time during the reboot immediately following a successful upgrade. This implies that the Standby SPE is running the new software while the Active SPE is still running the old software.

   The translation card-mem should be inserted into the Standby SPE at the appropriate time so as to allow the **upgrade software** command to be re-executed.

r. Error Type 804 (80386 only) is logged when the **upgrade software** command failed due to a loss of communication with the Standby SPE during the reboot immediately following a successful software upgrade. This implies that the communication path between the Active SPE and the Standby SPE may not be functional.

   Issue the **test duplication-interface a** and the **test duplication-interface b** commands. If the tests pass, re-execute the **upgrade software** command.

s. Error Type 805 (80386 only) is logged when the **upgrade software** command failed due to the failure to insert the software card-mem in the Active SPE in time.

   The software card-mem should be inserted into the Active SPE at the appropriate time so as to allow the **upgrade software** command to be re-executed.

t. Error Type 806 (80386 only) is logged when the **upgrade software** command failed due to a bad flash checksum on the new Standby SPE after an upgrade of the old Standby SPE and SPE-Interchange. This implies that the on-board flash memory may not be functional. The behavior of the Standby SPE may unpredictable.

   The **upgrade software** command should be re-executed. If the command fails again, the Standby SPE Processor circuit pack should be replaced.

u. Error Type 807 (80386 only) is logged when the **upgrade software** command failed due to the failure to insert the translation card-mem into the new Standby SPE after an upgrade of the old standby SPE and SPE-Interchange.

   The translation card-mem should be inserted into the Standby SPE.

v. Error Type 808 (80386 only) is logged when the **upgrade software** command failed due to the loss of communication with the new Standby SPE during an upgrade following the upgrade of the old standby SPE and SPE-Interchange. This implies that the programming of the Standby SPE never completed.

Use the "Special Upgrade Procedure" to re-execute an upgrade on the Standby SPE only. If the upgrade fails again, the Standby SPE Processor circuit pack should be replaced.

w. Error Type 809 (80386 only) is logged when the **upgrade software** command failed due to the failure to perform an SPE-Interchange immediately after the successful upgrade of the Standby SPE. This implies possible problems with the Dupint circuit packs.

   Issue the **test duplication-interface a** and **test duplication-interface b** commands. If the tests pass, re-execute the **upgrade software** command.

x. Error Type 810 (80386 only) is logged when the **upgrade software** command failed due to a bad checksum on the software card-mem during the upgrade of the new Standby SPE following the successful upgrade of the old Standby SPE and of SPE-Interchange.

   The software card-mem should be replaced by one that has a good checksum. The **upgrade software** command should be re-executed.

y. Whenever an SPE interchange is forced by using the **health-override** option as part of the **reset system interchange** command, a WARNING OFF circuit pack STBY-SPE alarm is raised, and the Fault Severity Level (FSL) of the new standby SPE is raised to its highest possible value to prevent an SPE interchange back to the original active SPE. This artificial FSL lasts one hour or until a **busyout spe-standby** command is executed, followed by a **release spe-standby** command. After this time, the FSL of the two SPEs are recomputed, and the healthiest SPE becomes or remains active.

z. The system interchanged from the active SPE to the standby SPE with a restart that is more disruptive to service than the normal system hot start. The switches were not used to force this interchange. The level of restart can be observed by using the **display initcauses** command. Look for other alarms on the standby SPE that possibly caused this interchange. Also see "Reset System Interchange (High or Critical Reliability Systems Only)" in Chapter 4, "Initialization and Recovery".

aa. The software vintage in the Standby SPE does not match the software vintage in the active SPE.

   The **upgrade software** command should be executed for the standby SPE as described in Chapter 5, "Routine Maintenance Procedures".

System Technician-Demanded Tests

The following commands can be used to test and manipulate part or all of the standby SPE:

- **busyout spe-standby**

The **busyout spe-standby** command is used to stop all standby maintenance activity, disable shadowing, and hold the standby processor reset. A warning off circuit pack alarm is also raised against STBY-SPE MO. This command is more powerful than the **refresh spe-standby** command because it preempts the standby and enters maintenance mode, where as the **refresh spe-standby** does not do this.

- **release spe-standby**

  The **release spe-standby** command is used to remove the busyout condition, restore memory shadowing, and force a refresh. One minute after the command is executed, the equivalent of standby scheduled maintenance is run.

- **refresh spe-standby**

  The **refresh spe-standby** command is used to put the Standby SPE immediately into Standby Mode. The command conducts the same activities regardless of whether the Standby SPE is already in Standby Mode or whether it is in Maintenance Mode. Whenever this command is issued, any Standby SPE maintenance activity currently in progress (except for entering maintenance mode) is preempted, the Standby SPE Processor is held reset, and the Standby SPE's memory is refreshed. Recall that the refresh is necessary because, while the Standby SPE is in Maintenance Mode, memory shadowing is disabled. When the Standby SPE is returned to Standby Mode, its memory must be brought up-to-date with Active SPE memory.

  Because they can preempt Standby SPE maintenance activities, the **refresh spe-standby** and **busyout spe-standby** commands should be used judiciously. If the Standby SPE is in Maintenance Mode when one of these commands is issued, the current maintenance activity being conducted by the Standby SPE is immediately terminated with the following potential side-effects:

  - Testing of the Standby SPE components that are the target of the maintenance activity may not have completed. Depending on the maintenance activity and the point at which such activity is terminated, tests that detect faults and/or lack of faults on those Standby SPE components may not have had the opportunity to run. Accordingly, alarms will not be raised or retired on the components.
  - If the maintenance activity is Scheduled Maintenance, and if the **refresh spe-standby** or **busyout spe-standby** command is issued before a scheduled translation save is performed, the translation save is not completed, and the translation data on both the Active SPE and Standby SPE and on the tapes [G3iV1.1-286] or on the memory cards [G3iV2-386] do not reflect the changes made since the last translation save.

  In general, after a **refresh spe-standby** has been used, and after the user has finished working with the system, the **test spe-standby long** command should be issued in the event that the **refresh spe-standby** command preempted a Standby SPE maintenance activity. Testing the standby SPE allows standby maintenance to re-determine the health of the standby SPE and to compare this health to that of the active SPE. This testing could result in an SPE interchange to a healthier SPE.

If the **busyout spe-standby** command has been used, the **release spe-standby** command should also be used. The latter command fully tests the standby SPE one minute later.

Also, if the **refresh spe-standby** or **busyout spe-standby** command was used within the time frame that scheduled maintenance with a translation save was to have been conducted, the **save translation** command should be issued to ensure that the current translation data has been written to the Active SPE and Standby SPE tapes.

When using the **refresh spe-standby** to preempt Standby SPE maintenance activities, it may be necessary to issue the **refresh spe-standby** command multiple times in order to preempt all Standby SPE maintenance activity. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the **status system** form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later". Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** command.

- **reset spe-standby <level>**

  Normally, when the standby is brought into maintenance mode, it is done so with a Warm Restart. The **reset spe-standby** command can be used to bring the standby SPE from standby mode into maintenance mode with the requested restart level.

- **reset system-interchange <health-override>**

  If the health-override option is NOT specified, and if the standby Fault Severity Level (FSL) is less than or equal to that of the active SPE, and if the standby SPE is in standby mode, the interchange is allowed. Actually, if the standby FSL is less than that of the active FSL, the system does its own interchange in due time. If the FSL of the standby SPE is higher than that of the active SPE, but the alarmed standby maintenance objects do not affect the ability of the standby SPE to be put into standby mode, the command is rejected. This indicates that the health-override option can be used. If there are problems that would prevent the standby SPE from running system software, the command is rejected outright.

  If the health-override option is specified, and if the standby SPE is in standby mode, a Hot interchange is performed, regardless of the FSL level of the two SPEs. Once the interchange is performed, if the new active FSL is higher than the standby FSL, a STBY-SPE warning alarm is raised against the new standby SPE. This indicates that the system was forced to switch SPEs and is currently being held on the active SPE artificially. This prevents a SPE interchange back to the original active SPE. This STBY-SPE warning alarm lasts for one hour. After this time passes, system switches to the SPE with the lowest FSL.

The STBY-SPE alarm is also retired if there is some indication of system technician testing of the standby SPE before the one hour expires. The assumption here is that a system technician person is present because the health-override option was used. Therefore, if there is some indication that repair work is going on, the alarm generated by the health-override should be retired. The following are indications of system technician testing being done: the standby SPE is busied out and then released, the active SPE is hard selected via the switches, or a **test spe-standby long** command is performed.

On a G3iV2-386 system only, if the two SPEs are running different versions of software, and if this is the only standby SPE problem, the health-override option can be used to force a Cold 2 interchange to the standby SPE.

- **test processor [[0]1] a|b [short | long]**

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the PROCR-BD and PR-MAINT sections for a complete list of the tests that are run.

- **test memory [[0]1] a|b [short | long]**

  For this command, there is one additional test for the Standby SPE Memory circuit pack: the Memory Functional Test #332. Refer to the MEM-BD section for a complete list of the tests that are run.

- **test data-module <extension>**

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the DATA-CHL section for a complete list of the tests that are run.

- **test tape [[0]1] a|b [short | long]** (for 286 configuration only).

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the TAPE section for a complete list of the tests that are run.

- **test network-control [[0]1] a|b [short | long]**

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the SW-CTL, DATA-BD, DATA-CHL, and CARD-MEM sections for a complete list of the tests that are run.

- [G3iV2-386] **test card-mem [[0]1] a|b [short | long]**

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the CARD-MEM section for a complete list of the tests that are run.

- **test packet-control [[0]1] a|b [short | long]**

For **test packet-control**, the most significant difference between testing the Active Packet Control versus the Standby Packet Control is that the Reset Test (#586) runs on the Standby SPE Packet Control circuit pack. Also, the short and long options cause the identical set of tests to run. Refer to the PKT-CTRL section for a complete list of the tests that are run.

- **test interface [[0]1] a1 | a2 | b1 | b2 [short | long]**

  For this command, there is a single test for the Standby SPE Processor Interface circuit pack(s) and a single test for each Processor Interface Port on a Processor Interface circuit pack. These tests are different from the tests that are run for the corresponding Active SPE Processor Interface circuit pack(s) and Processor Interface Port(s). Refer to the PI-PT section for a complete list of the tests that are run.

- **test duplication-interface [0[1] a|b [short | long]**

  Runs the same set of tests on the standby SPE as on the Active SPE. Refer to the DUPINT section for a complete list of the tests that are run.

- **test spe-standby [short | long]**

  The **test spe-standby [short | long]** command results in the execution of all tests that would be run if each of the previous commands in this list was executed individually. Because of the number of tests that it runs, **test spe-standby [short | long]** takes from 10 to 30 minutes to complete.

  The Short and Long Test Sequences for **test spe-standby** are listed on the following pages. Refer to the appropriate maintenance section for a complete description of each of the tests.

Test Sequence of Test SPE-Standby Command

Test Number	Name of Test and Associated Maintenance Object	Short Test Sequence	Long Test Sequence
332	Memory Functional Test (MEM-BD for 286 or MEMORY for 386)		X
318	Shadow Link Test (SHDW-LNK)		X
285	Common Shadow Circuit MBUS Time-out Query (SHDW-CIR)		X
283	Common Shadow Circuit Loop Back Test (SHDW-CIR)	X	X
284	Common Shadow Circuit Address Decoder Test (SHDW-CIR)	X	X
278	SPE Select Switch Query (SPE-SELEC)	X	X
315	Duplication Interface Status Query (DUPINT)	X	X

Test Sequence of Test SPE-Standby Command

Test Number	Name of Test and Associated Maintenance Object	Short Test Sequence	Long Test Sequence
275	Duplication Interface SPE A Loop Back Test (DUPINT)	X	X
276	Duplication Interface SPE B Loop Back Test (DUPINT)	X	X
280	Inter-Duplication Interface Loop Back Test (DUPINT)	X	X
271	Duplication Interface Background Test Query (DUPINT)	X	X
277	Duplication Interface Sanity Maze Test (DUPINT)	X	X
272	Duplication Interface Invalid Message Query (DUPINT)	X	X
274	Duplication Interface Manager I Loop Back Test (DUPINT)	X	X
273	Duplication Interface Sanity Circuit Test (DUPINT)		X
85	Read All Memory Test (MEM-BD for 286 or MEMORY for 386)		X
86	RAM Checksum Test (MEM-BD for 286 or MEMORY for 386)		X
87	**For a 286 Configuration:** Memory Error Detection/Correction/Exception Test (MEM-BD or MEMORY) **For a 386 Configuration:** Memory Parity Test (MEM-BD or MEMORY)	X	
631	**For 286 Configuration Only:** Memory Board Vintage Check Test (MEM-BD or MEMORY)	X	X
52	Control Channel Test (DATA-BD)	X	X
50	NPE Audit (DATA-BD)		X
For each administered Network Control Data Channel in the Standby SPE, the following DATA-CHL tests are run:			
107	Data Channel Reset (DATA-CHL)		X
108	Data Channel DPR Test (DATA-CHL)		X

Test Sequence of Test SPE-Standby Command

Test Number	Name of Test and Associated Maintenance Object	Short Test Sequence	Long Test Sequence
109	Data Channel Maintenance Loop Around Test (DATA-CHL)	X	X
110	Data Channel Crosstalk Test (DATA-CHL)	X	X
111	Data Channel Loop Back Test (DATA-CHL)	X	X
93	Switch Control Reset Test (SW-CTL)		X
325	Destructive EPN Maintenance Board Interface Test (SW-CTL)		X
95	Time-of-Day Clock Test (SW-CTL)	X	X
92	Control Channel Interface Test (SW-CTL)	X	X
94	Control Channel Transmission Test (SW-CTL)	X	X
324	EPN Maintenance Board Interface Test (SW-CTL)	X	X
77	Processor Software Initiated Interrupt Test (PROCR)	X	X
80	Processor ROM Checksum Test (PROCR)	X	X
82	Processor Non-Maskable Interrupt Test (PROCR)	X	X
83	Processor Sanity Timer Test (PROCR)		X
102	MTP Outpulse Relay Test (PR-MAINT)	X	X
103	MTP Analog Loop Around Test (PR-MAINT)	X	X
106	MTP Sanity Handshake Test (PR-MAINT)	X	X
228	MTP Manager I Channel Loop Around Test (PR-MAINT)	X	X
229	MTP Auxiliary Channel Loop Around Test (PR-MAINT)	X	X
101	MTP Reset Test (PR-MAINT)		X
104	MTP Dual Port RAM Test (PR-MAINT)		X

Test Sequence of Test SPE-Standby Command

Test Number	Name of Test and Associated Maintenance Object	Short Test Sequence	Long Test Sequence
For 286 Configuration, the following Tape tests are run:			
67	Tape Reset Test (TAPE)		X
692	Tape Block Error Test (TAPE)		X
65	Tape Read/Write Test (TAPE)		X
230	Tape DMA Address Latch Test (TAPE)	X	X
66	Tape Diagnostic Test (TAPE)	X	X
69	Tape Status Test (TAPE)	X	X
421	Tape Consistency Test (TAPE-DAT)		X
For a 386 configuration, the following Memory Card and 12 Volt Power Supply tests are executed:			
701	12 Volt Power Supply Test (12V-PWR)	X	X
695	Cartridge Insertion Test (CARD-MEM)	X	X
696	Cartridge Format and Read Test (CARD-MEM)	X	X
697	Cartridge Match Test (CARD-MEM)	X	X
698	Cartridge Write-Protected Test (CARD-MEM)	X	X
699	Cartridge Directory Sanity Check and Recovery Test (CARD-MEM)	X	X
694	Cartridge Translation Data Integrity Test (CARD-MEM)		X
693	Cartridge Erase/Write/Read Test (CARD-MEM)		X
703	Flash Data Consistency Test (FL-DATA)		X
For each Processor Interface circuit pack in the Standby SPE, the following PI-BD tests are run:			
52	Control Channel Test (PI-BD)	X	X
50	NPE Audit (PI-BD)		X
423	Standby PI Board Test (PI-BD)	X	X
For each administered Processor Interface Port, the following test is run:			
404	Standby PI Port Test (PI-PT)	X	X

Test Sequence of Test SPE-Standby Command

Test Number	Name of Test and Associated Maintenance Object	Short Test Sequence	Long Test Sequence
For a Packet Control circuit packet in the Standby SPE, the following three tests are run:			
586	Packet Control System Technician Reset Test (PKT-CTRL)	X	X
583	Packet Control Read and Clear Error Counter Test (PKT-CTRL)	X	X
585	Packet Control Loop Around Test (PKT-CTRL)	X	X

Useful Facts About Running Tests on the Standby SPE

Although this subsection is not about the individual test commands listed previously, several useful facts about executing these commands for Standby SPE components are mentioned here. These facts also apply to the **test spe-standby [short | long]** command.

1. If the Standby SPE is in Standby Mode, execution of the listed test commands results in the Active SPE putting the Standby SPE into Maintenance Mode. Up to a two minute delay may be observed before the first test in the sequence is run and its test results are displayed on the terminal. Each subsequent test in the sequence takes from 10 to 60 seconds to run, except for the CARD-MEM Erase/Write/Read test #693, which takes one to five minutes to run.
2. The **test memory [[0]1] a | b long** command is an exception to the first item. The first test in the sequence is the Memory Functional Test (#332) which takes from 30 seconds to two minutes. After the Memory Functional Test (#332) is run, the same delays described in Item 1 of this list are relevant.
3. The **test duplication-interface [[0]1] a | b long** command is also an exception to the first item. The first test in the sequence is the MBUS Time-out Query (#285) which takes from 30 seconds to 2 minutes to run. After the MBUS Time-out Query (#285) is run, the same delays described in Item 1 of this list are relevant.
4. The **test spe-standby long** command is also an exception to the first item. The first test in the sequence is, the Memory Functional Test (#332), takes from 30 seconds to two minutes to run. After the Memory Functional Test (#332) is run, the next test in the sequence, the Shadow Link Test (#318), takes from one to five minutes to run. After the Shadow Link Test (#318) is run, the next test in the sequence, the MBUS Time-out Query (#285), takes from 30 seconds to two minutes to run. After the MBUS Time-out Query (#285) is run, the same delays described in Item 1 of this list are relevant.
5. If one of listed test commands is executed so that the Active SPE puts the Standby SPE into Maintenance Mode, the Active SPE leaves the Standby SPE in Maintenance Mode for three minutes after the completion of the command. If an additional test command (with the exception of those described in Items 6, 7, and 8) is executed within three minutes, the one to 20-minute delay prior to the first test will **not** be observed. Each test in the sequence, including the first test, takes from 10 to 60 seconds to run.

   Furthermore, the Active SPE leaves the Standby SPE in Maintenance Mode for three minutes after the completion of the additional command. This is true for each additional test command issued on a Standby SPE component.
6. The **test memory [[0]1] a | b long** command is an exception to Item 5. Because of the nature of the Memory Functional Test (#332) the same delays as described in Item 2 are always observed for **test memory [[0]1] a | b long**.

7. The **test duplication-interface [[0]1] a | b long** command is also an exception to Item 5. Because of the nature of the MBUS Time-out Query (#285) the same delays as described in Item 3 are always observed for **test duplication-interface [[0]1] a | b long**.
8. The **test spe-standby long** command is also an exception to Item 5. Because of the nature of the Memory Functional Test (#285), the Shadow Link Test (#318), and the MBUS Time-out Query (#285) the same delays as described in Item 4 are always observed for **test spe-standby long**.
9. For test commands whose sequence spans multiple terminal screens (for example, **test spe-standby [short | long]**) the same 3-minute window that was described in Item 4 applies to pressing the "page" key to proceed to the next screen of test results. If the "page" key is not pressed within three minutes of the completion of the last test on the current screen, the one to 20 minute delay is observed before the first test on the next screen is run and its test results are displayed on the terminal. Each subsequent test on that screen takes from 10 to 60 seconds to run. If the "page" key is pressed within three minutes of the completion of the last test on the current screen, the one to 20 minute delay will **not** be observed.

Test Result Error Codes and Text Strings

The text string messages and error codes documented in the Error Codes tables at the end of this section may result from any of the system technician commands described earlier in this section.

In general, these error codes result from an inability of the Active SPE to successfully conduct a maintenance activity request on the Standby SPE and not from a problem detected by the test itself. In fact, all error codes except for 2015, 2021, 2047, 2048, 2049, and 2050 indicate that the test was not actually run.

If an error code returned from a test does not appear in the Error Code table, the Active SPE successfully conducted the maintenance activity request on the Standby SPE, and the test was actually run (in most cases). For details on this error code, refer to the documentation describing the specific object you now suspect as possibly being defective. In the Short and Long Test Sequences listed earlier in this section, the name of the object tested appears directly after each test number and name.

Several of the conditions corresponding to the error codes documented here may be detected as soon as the **test <component> [[0]1] a | b [short | long]** command is issued. The net result is that none of the tests in the sequence for the component will be attempted and a message will appear on the terminal message line describing why the command was rejected.

The following is a list of these text strings.

- **Cannot interrupt Standby SPE while entering maintenance mode; please try later**

  This message line error is displayed when a **refresh spe-standby** command is issued while maintenance software is in the process of putting the Standby SPE into Maintenance mode when any of the Error Types listed in "Hardware Error Log Entries and Test to Clear Value" have occurred and have not been resolved. It is also displayed when a system technician-demanded test has been issued and subsequently canceled because maintenance software is performing the Memory Functional Test, Shadow Link Test, or M-BUS Time-out Query. Another cause may be that maintenance software is in the process of putting the Standby SPE into Maintenance Mode to run any other system technician-demanded test that must be conducted on the Standby SPE in Maintenance Mode. Allow up to 10 minutes for the maintenance software to complete its attempt to put the Standby SPE into Maintenance Mode before issuing the **refresh spe-standby** command.

- **Cannot perform SPE interchange; for information use status system**

  This message is displayed in response to the **reset system interchange** command and because there are outstanding STBY-SPE errors. Display the error log using the "dup-spe" category, and following the procedures for all STBY-SPE errors.

- **Cannot reset standby SPE at this time; use the 'status system' command**

  This message is displayed when the standby SPE memory is not refreshed. Issue the **refresh spe-standby** command and try the reset again.

- **Could only hold Standby SPE reset because Active SPE is locked via SPE select switches**

  This message is displayed when the **refresh spe-standby** command is issued when the active SPE is selected via the SPE select switches. Because the select switches disable shadowing, the refresh command can not refresh the memory on the standby SPE. The only effect the refresh command has is to hold the standby SPE reset.

- **Refresh not successful; use the 'display errors' and the 'dup-spe' category to check for standby SPE errors**

  This message line error, which corresponds to Error Codes 2012, 2013, 2014, 2015, 2021, 2024, 2048, 2049, 2050, or 2051, is displayed when a **refresh spe-standby** command fails.

- **Standby SPE busy with another task; for information use status system**

  This message line error, which corresponds to Error Code 2018, is displayed if a test command on a Standby SPE component is attempted while the Active SPE is performing some Maintenance Mode activity on the Standby SPE other than system technician-demanded maintenance.

  1. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** and **release spe-standby** command to put the standby into standby mode.
  2. Repeat the command.
  3. Issue the **test spe-standby long** command.

- **Standby** SPE **failed to reset with requested restart level; check for STBY-SPE errors**

- **Standby SPE memory not refreshed; use the 'refresh spe-standby' command**

When a command that requires the standby SPE to be brought into maintenance mode is entered, but the standby SPE memory is not refreshed, this message is displayed. Issue the **refresh spe-standby** command and retry the command.

- **Standby SPE not available; for information use status system**

  This message line error, which corresponds to Error Code 2020, is displayed if a test command on a Standby SPE component is attempted within the first five minutes of a restart of the Active SPE (that is, prior to the Active SPE holding the Standby SPE reset and refreshing it).

  1. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** and **release spe-standby** command to put the standby into standby mode.
  2. Repeat the command.
  3. Issue the **test spe-standby long** command.

- **Unable to interchange because the active SPE is locked active**

  An SPE interchange cannot be performed when the active SPE is locked via the SPE select switches. Move the select switches back to the auto position and retry the **reset system interchange** command.

- **Unable to interchange because the standby SPE is busied out**

  An SPE interchange can not be performed when the standby SPE is busied out. Release the standby SPE by entering the **release spe-standby** command and retry the command.

- **Unable to interchange due to alarms on the standby SPE; Use the ‘health-override’ option**

  When components in the standby SPE complex are alarmed, and if these Standby alarms are more severe than the alarms in the active SPE complex, the **reset system-interchange** command returns this message. Using the **reset system-interchange health-override** command forces the interchange. See the **Reset System** command page for more details.

Table 11-326. Test Result Error Codes Associated with the Standby SPE

Error Code	Test Result	Description/ Recommendation
4	ABORT	The Active SPE was unable to disable or enable shadowing from Active SPE memory to Standby SPE memory. The communication path between the Active SPE and the carrier A Duplication Interface circuit pack may have failed, or the carrier A Duplication Interface circuit pack may have failed. 1. Check for Active SPE Maintenance/Tape Processor errors and alarms. Refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation and follow the prescribed procedures. 2. Check for carrier A Duplication Interface circuit pack errors and alarms. Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance documentation and follow the prescribed procedures. 3. If the B carrier contains the Active SPE, check the Inter-Carrier Cable to see if it is loose or disconnected. If so, follow the repair procedures for connecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 4. If all problems found in Steps 1, 2, and 3 have now been repaired, proceed with Step 7. If no problems were found in Steps 1, 2, and 3, proceed with Step 5. 5. Issue the **display errors** command and check to see if an Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 7, 8, and 9.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
4 *(cont'd.)*	ABORT	6. If no error type is logged, the problem may be the carrier A Duplication Interface circuit pack. ■ If the red LED on the carrier A Duplication Interface circuit pack is on, replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 7, 8, and 9. ■ If the red LED on the carrier A Duplication Interface circuit pack is not on **AND** if this is the first attempt to clear the problem, replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 7, 8, and 9. ■ If the LED is not on **AND** if this is the second attempt to clear the problem (that is, the carrier A Duplication Interface circuit pack has already been replaced), stop here and escalate the problem. 7. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** and **release spe-standby** command to put the standby into standby mode. 8. Repeat the command. 9. Issue the **test spe-standby long** command.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
1029	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1030	ABORT	The component on which the test was to be run is on the Standby SPE. This test may only be run on this component when it resides on the Active SPE. If it is absolutely necessary to conduct this test on the Standby SPE component, implement the following steps to make it become an Active SPE component. 1. Issue the **refresh spe-standby** command to return the Standby SPE to Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 2. Issue the **reset system interchange** command in order to cause an SPE switch. At this point, the component resides on the Active SPE.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
1030 *(cont'd.)*	ABORT	3. Move the SPE Select switches to make the SPE with the problem the current Active SPE. This action prevents software from switching to the other SPE since the current SPE has the error against it. 4. Repeat the test. 5. If the test passes and the alarm is resolved, return the SPE Select switches to the AUTO position. 6. If the test fails and the defective circuit pack is identified, the circuit pack needs to be replaced. However, the circuit pack now resides on the current Active SPE. Return the SPE Select switches to the AUTO position. Issue the **refresh spe-standby** command and then execute a **reset system interchange** command to cause an SPE switch. 7. The system is now on the healthy SPE. Replace the defective circuit pack on the Standby SPE as previously identified in Step 4. Refer to the "Replacing Defective SPE Circuit Packs" section in Chapter 8, "Reliability Systems: A Maintenance Aid". 8. Repeat the procedure, beginning with Step 1.
2011 2012 2013	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2015	ABORT	The Standby SPE Maintenance/Tape Processor did not reply to an Active SPE request to hold the Standby SPE Processor reset. The communication path between the Active SPE and the Standby SPE Maintenance/Tape Processor may have failed, or the Standby SPE Maintenance/Tape Processor may have failed. Follow the procedures described for Error Code 2024 in the STBY-SPE section.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2016 2017	ABORT	The Active SPE attempted to put the Standby SPE into Maintenance Mode, but did not receive notification from the Standby SPE Maintenance software that it successfully entered Maintenance Mode **OR**, once in Maintenance Mode, the Standby SPE sent a request to the Active SPE to have the Active SPE conduct a portion of a test in the Standby SPE's behalf, but the Standby SPE did not receive a response to its request. In either case, the communication path between the Active SPE and the Standby SPE may have failed. Follow the procedures described for Error Code 2024 in the STBY-SPE section.
2018	ABORT	The test requires that a maintenance activity request be made to the Standby SPE; however, the request cannot be made because the Standby SPE is busy processing a previous maintenance activity request. 1. Issue the **refresh spe-standby** command to force the Standby SPE to Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 30 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the **status system** form after this attempt, escalate the problem. 2. Repeat the test. 3. Issue the **test spe-standby long** command to thoroughly test all Standby SPE components.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2019	ABORT	A translation save on the Standby SPE was not carried out because the Shadow Link Test failed. (The Shadow Link Test was done to verify the integrity of the translation data on the Standby SPE.) 1. Check for Memory Shadowing Link errors and alarms. Refer to SHDW-LNK (Memory Shadowing Link) Maintenance documentation and follow the prescribed procedures.
2020	ABORT	The test requires that a maintenance activity request be made to the Standby SPE; however, the request cannot be made because the Active SPE was restarted within the last five minutes and has not yet initialized the Standby SPE. Therefore, the Standby SPE is not available to handle maintenance activity requests. 1. Issue the **refresh spe-standby** command to force the Standby SPE to Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use ‘display errors’ to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the **status system** form after this attempt, escalate the problem. 2. Repeat the test. 3. If the Active SPE was restarted with a Cold 1 or a reboot, issue the **test spe-standby long** command to thoroughly test all Standby SPE components.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2021	ABORT	An attempt to refresh Standby SPE memory from Active SPE memory encountered a problem. In this case, the refresh from Active SPE Memory to Standby SPE Memory probably succeeded. However, the following steps should be followed just to verify that there are no problems. 1. Check for Active SPE Memory errors and alarms. Refer to MEM-BD (Memory circuit pack) Maintenance and follow the prescribed maintenance procedures. 2. Issue the **refresh spe-standby** command. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the **status system** form after this attempt, escalate the problem.
2022	ABORT	The Active SPE successfully put the Standby SPE into Maintenance Mode but received an incorrect response to a maintenance activity request that it made to the Standby SPE **OR,** once in Maintenance Mode, the Standby SPE sent a request to the Active SPE to have the Active SPE conduct a portion of a test in the Standby SPE's behalf, but the Standby SPE received an incorrect response to its request. The communication path between the Active SPE and the Standby SPE may have failed. Follow the procedures described for Error Code 2024 in the STBY-SPE section.
2023	ABORT	Internal System Error 1. Follow normal escalation procedures.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2024	ABORT	The Standby SPE Maintenance/Tape Processor did not respond to an Active SPE request to release the Standby SPE Processor to perform a function; **OR** the Standby SPE Processor was released but did not carry out the requested function and/or did not reply to the request; **OR** the Standby SPE Processor was released but cannot run because the Standby SPE Memory is defective. The communication path between the Active SPE and the Standby SPE Maintenance/Tape Processor may have failed, or the Standby SPE Maintenance/Tape Processor may have failed, or the Standby SPE Processor may have failed. 1. Check for Active SPE Maintenance/Tape Processor errors and alarms. Refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation and follow the prescribed procedures. 2. Check for carrier A Duplication Interface circuit pack errors and alarms. Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance documentation and follow the prescribed procedures. 3. Check for Standby SPE Maintenance/Tape Processor errors and alarms. Refer to PR-MAINT (Maintenance/Tape Processor) Maintenance documentation and follow the prescribed procedures. 4. Check for Standby SPE Processor errors and alarms. Refer to PROCR (80286 Processor Circuit Pack) Maintenance documentation and follow the prescribed procedures. 5. Check for Standby SPE Memory errors and alarms. Refer to MEM-BD (Memory circuit pack) Maintenance documentation and follow the prescribed procedures.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2024 *(cont'd.)*	ABORT	6. Check the Inter-Carrier Cable to see if it is loose or disconnected. If so, follow the repair procedures for reconnecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 7. If all problems found in Steps 1, 2, 3, 4, 5, and 6 have now been repaired, proceed with Step 11. If no problems were found in Steps 1, 2, 3, 4, 5, and 6, proceed with Step 8. 8. Issue the **display errors** command and check to see if Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. 9. Issue the **display errors** command and check to see if an Error Type 81 is logged against STBY-SPE. If so, the problem is the Standby SPE Processor circuit pack. Replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2024 *(cont'd.)*	ABORT	10. Issue the **display errors** command and check to see if Error Type 58 is logged against STBY-SPE. If an Error Type 58 is logged **OR** if none of the three error types are logged, the problem is either the Standby SPE Processor circuit pack or the Standby SPE Memory circuit pack or the carrier A Duplication Interface circuit pack. ■ If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has not been replaced yet, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. If the red LED on the Standby SPE Processor circuit pack is on, and if the Standby SPE Processor circuit pack has been replaced, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If the red LED on the Standby SPE Memory circuit pack is on, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If the red LED on the carrier A Duplication Interface circuit pack is on, replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If none of the three red LEDs is on **AND** if this is the first attempt to clear the problem, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2024 *(cont'd.)*	ABORT	■ If none of the three red LEDs is on **AND** if this is the second attempt to clear the problem, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If none of the three red LEDs is on **AND** if this is the third attempt to clear the problem, replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If none of the three red LEDs is on **AND** if this is the fourth attempt to clear the problem, replace the carrier B Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If none of the three LEDs is on **AND** if this is the fifth attempt to clear the problem, stop here and escalate the problem.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2024 *(cont'd.)*	ABORT	11. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** and **release spe-standby** command to put the standby into standby mode. 12. Repeat the command. 13. Issue the **test spe-standby long** command.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2025	ABORT	The Standby SPE Maintenance/Tape Processor successfully released the Standby SPE processor, but the Standby SPE processor did not successfully carry out the requested function. Either there is a problem with one or more components that make up the Memory Shadowing Link such that Active SPE Memory was not accurately shadowed to Standby SPE Memory **OR** there is a problem with the Standby SPE Processor circuit pack or the Standby SPE Memory circuit pack. 1. Check for both Active SPE and Standby SPE Common Shadow Circuit errors and alarms. Refer to SHDW-CIR (Common Shadow Circuit) Maintenance documentation and follow the prescribed procedures. 2. Check for Standby SPE Memory errors and alarms. Refer to MEM-BD (Memory circuit pack) Maintenance documentation and follow the prescribed procedures. 3. Check for Standby SPE Processor errors and alarms. Refer to PROCR (80286 Processor Circuit Pack) Maintenance documentation and follow the prescribed procedures. 4. Check the Inter-Carrier Cable to see if the cable is loose or disconnected. If so, follow the repair procedures for reconnecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 5. If all problems found in Steps 1, 2, 3, and 4 have now been repaired, proceed with Step 10. If no problems were found in Steps 1, 2, 3, and 4, proceed with Step 6.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2025 *(cont'd.)*	ABORT	6. Issue the **display errors** command and check to see if an Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. 7. Issue the **display errors** command and check to see if an Error Type 82 is logged against STBY-SPE. If so, the problem is the carrier B Duplication Interface circuit pack. Replace the carrier B Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. 8. Issue the **display errors** command and check to see if Error Type 85 is logged against STBY-SPE. If so, the problem may be the Standby SPE Memory circuit pack. Replace the Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. 9. Issue the **display errors** command and check to see if Error Type 58 is logged against STBY-SPE. If Error Type 58 is logged **OR** if no error type is logged, the problem is either the Standby SPE Processor circuit pack, the Standby SPE Memory circuit pack, or the carrier A Duplication Interface circuit pack. ■ If the red LED on the Standby SPE Processor circuit pack is on and the Standby SPE Processor circuit pack has not been replaced yet, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. If the red LED on the Standby SPE Processor circuit pack is on, and if the Standby SPE Processor circuit pack has been replaced, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2025 *(cont'd.)*	ABORT	■ If the red LED on the Standby SPE Memory circuit pack is on, replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. ■ If the red LED on the carrier A Duplication Interface circuit pack is on, replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 11, 12, and 13. ■ If none of the three red LEDs is on **AND** if this is the first attempt to clear the problem, replace the Standby SPE Processor circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. ■ If none of the three red LEDs is on **AND** if this is the second attempt to clear the problem (that is, the Standby SPE Processor circuit pack has already been replaced), replace the Standby SPE Memory circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12. ■ If none of the three red LEDs is on **AND** if this is the third attempt to clear the problem (that is, the Standby SPE Processor and Standby SPE Memory circuit packs have already been replaced), replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 10, 11, and 12.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2025 *(cont'd.)*	ABORT	■ If none of the three red LEDs is on **AND** if this is the fourth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and carrier A Duplication Interface circuit packs have already been replaced), proceed with Step 10. ■ If none of the three red LEDs is on **AND** if this is the fifth attempt to clear the problem (that is, the Standby SPE Processor, Standby SPE Memory, and carrier A Duplication Interface circuit packs have already been replaced and the test has been repeated once), stop here and escalate the problem. 10. Issue the **refresh spe-standby** command to put the Standby SPE into Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, use the **busyout spe-standby** and **release spe-standby** command to put the standby into standby mode. 11. Repeat the command. 12. Issue the **test spe-standby long** command.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2051	ABORT	When attempting to refresh Standby SPE memory from Active SPE memory, the Active SPE could not determine the status of one of the Duplication Interface circuit packs, or it determined that one of the Duplication Interface circuit packs was defective. 1. Check for carrier A Duplication Interface circuit pack errors and alarms. Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance documentation and follow the prescribed procedures. 2. Check for carrier B Duplication Interface circuit pack errors and alarms. Refer to DUPINT (Duplication Interface Circuit Pack) Maintenance and follow the prescribed procedures. 3. Check the Inter-Carrier Cable to see if the cable is loose or disconnected. If so, follow the repair procedures for reconnecting the Inter-Carrier Cable described in Chapter 8, "Reliability Systems: A Maintenance Aid". 4. If all problems found in Steps 1, 2, and 3 have now been repaired, proceed with Step 8. If no problems were found in Steps 1, 2, and 3, proceed with Step 5. 5. Issue the **display errors** command and check to see if Error Type 80 is logged against STBY-SPE. If so, the problem is the carrier A Duplication Interface circuit pack. Replace the carrier A Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 8, 9, and 10. 6. Issue the **display errors** command and check to see if Error Type 82 is logged against STBY-SPE. If so, the problem is the carrier B Duplication Interface circuit pack. Replace the carrier B Duplication Interface circuit pack as described in Chapter 8, "Reliability Systems: A Maintenance Aid" and proceed with Steps 8, 9, and 10. 7. If Error Type 80 or 82 is not logged, stop here and escalate the problem.

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Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
2051 *(cont'd.)*	ABORT	8. Issue the **refresh spe-standby** command to put the Standby SPE in Standby Mode. This command may have to be issued multiple times. If the **refresh spe-standby** command successfully completes five times without the Standby SPE becoming labeled "standby" on the status system form, wait 20 minutes. This does not include cases where the command completes with the terminal message line errors "Refresh not successful; use 'display errors' to check for STBY-SPE errors" or "Cannot interrupt Standby SPE while entering maintenance mode; please try later." Issue the **refresh spe-standby** command once more. If the Standby SPE is not labeled "standby" on the status system form after this attempt, escalate the problem. 9. Repeat the test. 10. Issue the **test spe-standby long** command to thoroughly test all Standby SPE components.
2054	ABORT	This indicates an incompatibility between the two Processor circuit packs in a Duplication Option system. Follow the repair steps for STBY-SPE error 139 note (k).
2068	ABORT	When attempting to refresh Standby SPE memory from Active SPE memory, a problem was encountered when refreshing Packet Control circuit pack memory. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
other	ABORT	Any ABORT with an error code other than the ones listed previously indicates a problem that prevented the test from running. See Test Result of each maintenance object under test for details.

Continued on next page

Table 11-326. Test Result Error Codes Associated with the Standby SPE — *Continued*

Error Code	Test Result	Description/ Recommendation
other	FAIL	Any FAIL indicates that the test was actually run on the associated Standby SPE component. However, the test did not succeed and returned FAIL with the reason for the failure. See Test Result of each maintenance object under test for details.
	PASS	The test was actually successfully run on the associated Standby SPE component and returned PASS. See Test Result of each maintenance object under test for details.

STRAT-3 (Stratum 3 Clock)]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
STRAT-3	MAJOR	test synchronization	Stratum 3 Clock
STRAT-3	MINOR	test synchronization	Stratum 3 Clock
STRAT-3	WARNING	test synchronization	Stratum 3 Clock

The *Digital Synchronization Network Plan (PUB 60110)* specifies a hierarchy of synchronization nodes consisting of strata 1 to 4, where the sole Stratum 1 clock in the network is the most accurate. DEFINITY supports both Stratum 3 and Stratum 4 operations. Refer to SYNC (Synchronization) Maintenance documentation for details on Stratum 4 operation.

A Stratum 3 clock derives its timing from two DS1 references that are connected to a Stratum 3 or better (that is, lower stratum) source. The Stratum 3 clock provides a holdover of at least 24 hours should both DS1 references fail. (After 24 hours, the Stratum 3 clock still provides service but its accuracy may be degraded). The *Digital Synchronization Network Plan (PUB 60110)* requires that the Stratum 3 clock have duplicated components.

The recognition of the Stratum 3 clock itself as well as its alarm signals, is supported only by the TN780 Tone-Clock circuit pack. The TN780 Tone-Clock circuit pack is also backwards-compatible with the TN768 Tone-Clock circuit pack.

The Stratum 3 clock may be connected to either the PPN or an EPN if the TN780 Tone-Clock circuit pack(s) is present in that port network. However, for reliability, it is recommended that the clock be connected to the PPN. Refer to *DEFINITY Communications System Generic 3 Implementation*, 555-230-653 for details on how to move the Stratum 3 clock between port networks.

The only operation that software can perform is a query of the alarm leads. The only recovery action that can be performed on a catastrophic failure of the Stratum 3 clock is the utilization of the local oscillator on the Active TN780 Tone-Clock circuit pack. Neither software nor the TN780 Tone-Clock circuit pack can request additional information about the health of the Stratum 3 clock other than the information provided by the alarm leads. Furthermore, neither the software nor the TN780 Tone-Clock circuit pack can request that the external clock switch references, change configuration, disable/enable, initialize, etc.

In G3iV1.1-286 and G3iV2-386, the Stratum 3 clock has been implemented as an external that follows the specification in PUB 60110 for Stratum 3. Figure 11-95 shows how the Stratum 3 hardware configuration provides clock and alarm signals to the TN780 Tone-Clock circuit pack(s). The reference DS1 facilities are connected directly to the Stratum 3 clock for timing purposes, but the DS1 data may be routed into the switch by using a Y connector.

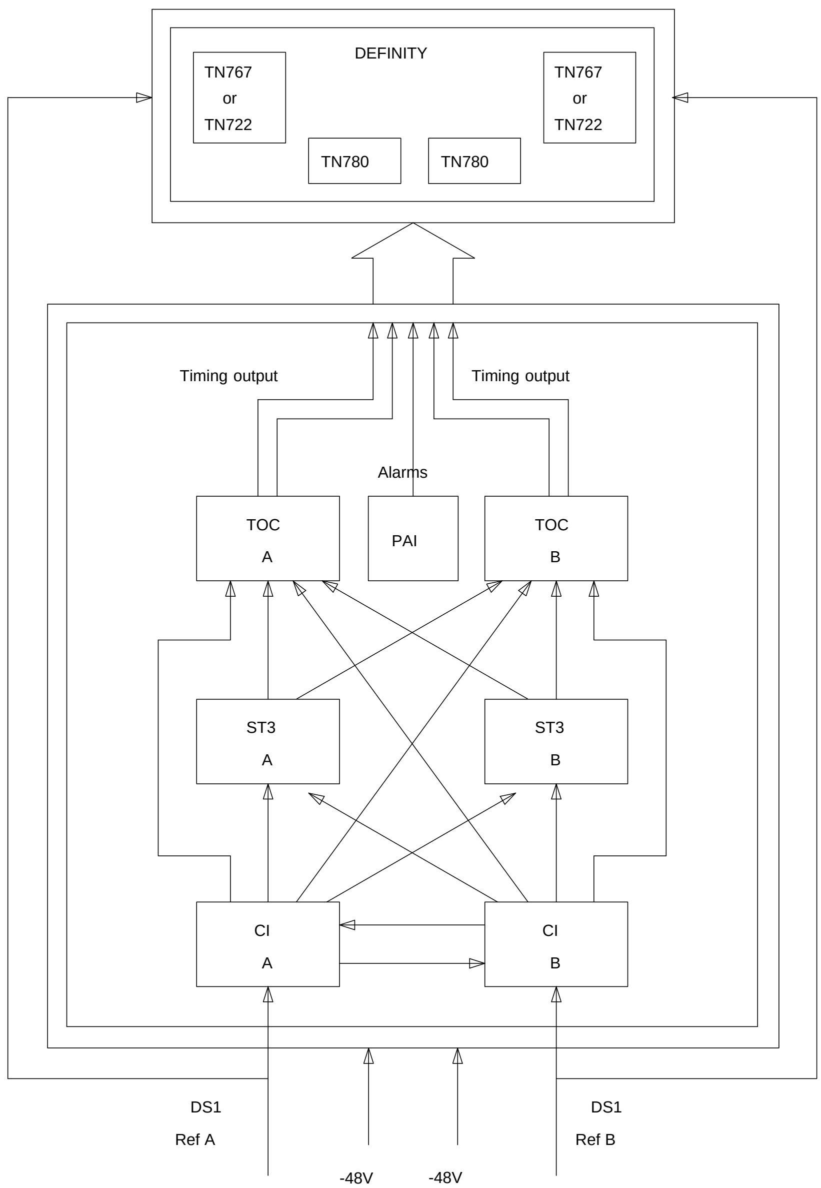

Figure 11-95. Stratum 3 Clock Hardware Configuration

NOTE:
When looking in the Stratum 3 cabinet, "A" card is on the left and "B" card is on the right.

Stratum 3 Clock LED Strategy

Red and green LEDs are provided on the components of the Stratum 3 clock for status and alarm indications.

WARNING:
The normal LED scheme is not followed for this device. Green LEDs do not indicate maintenance activity. There are no yellow LEDs, and there are more than three LEDs per circuit pack.

The Stratum 3 clock has the following components:

- 2 Clock Input cards (CI)

  Provides the logic to select the better DS1 reference or Clock Input card. The red FAIL LED on this card indicates a failure with the card or the DS1 reference connected to it.

- 2 Stratum 3 Cards (ST3)

  Provides 24-hour holdover. The red FAIL LED on this card indicates a failure with the card. Replace the card.

- 2 Timing Output Cards (TOC)

  Provides cable length compensation, multiple output ports, selection of the ST3, and CI outputs. This type of card has two red failure LEDs: one indicates a failure of the card; the other indicates a failure in one or more output ports. In either case, replace the card.

- 1 PBX Alarm Interface (PAI)

  Filters power supplied to the clock, provides fuse protection, and provides alarm indications based on inputs supplied by other cards. The six LEDs on this card provide indications for the six alarm or status conditions as follows:

  1. Loss of DS1 reference A.
  2. Loss of DS1 reference B.
  3. Loss of one clock unit.
  4. Loss of both clock units.
  5. Loss of one power supply.
  6. Loss of both power supplies.

NOTE:
Removal of a card in the Stratum 3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum 3 clock to full service.

The output of the CI and PAI cards go directly to the TN780 Tone-Clock circuit pack via two 25-pair amp-terminated cables. All of the cards have red and/or green LEDs for providing status or alarm indications. The following table shows the Stratum 3 Clock LED indications.

NOTE:
The abbreviations used in the table were defined previously with the exception of SRC (source) and PLL (Phase Locked Loop).

Table 11-327. Stratum 3 Clock LED Indications

Card	Name	Color	Indication
PAI	REF A	Red	Loss of input reference A or CI A failed
	REF B	Red	Loss of input reference B or CI A failed
	ST A	Red	Failed Stratum 3 clock A
	ST B	Red	Failed Stratum 3 clock B
	PWR A	Green	-48VDC A present
	PWR B	Green	-48VDC B present
CI	FAIL	Red	Card failure
	DS1	Green	DS1 source present
	CC	Green	Composite clock source[1] present
	SRC ACTIVE	Green	Card is currently on-line
ST3	FAIL	Red	Card failure
	LOCK	Red	PLL lost sync with reference or holdover mode
	REF A	Red	Timing Reference from CI A
	REF B	Red	Timing Reference from CI B
TOC	FAIL	Red	Card failure
	PORT ALM	Red	Output port alarm (one or more)
	ST	Green	Reference present from ST clock
	INPUT	Green	Reference present from CI
	500’	Green	500 feet phase advance
	1000’	Green	1000 feet phase advance

1 Composite Clock source refers to the protocol used to electrically transfer timing from the Stratum 3 clock to the PBX switch. The Composite Clock source is not relevant to Definity Generic 1.1.

NOTE:
When looking in the Stratum 3 cabinet, "A" card is on the left and "B" card is on the right.

Hardware Error Log Entries and Test to Clear Values

Stratum 3 Clock Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test synchronization r 4
1 (d)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR	OFF	test synchronization r 4
257 (e)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR	OFF	test synchronization r 4
257 (c)		None	WARNING	ON	
513 (f)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR	ON	test synchronization r 4
769 (g)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR	ON	test synchronization r 4
1025 (h)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR/ MAJOR(a)	ON	test synchronization r 4
1281 (i)	Any	Stratum 3 Clock Alarm Query (#649)	MINOR/ MAJOR(a)	ON	test synchronization r 4
1537 (b)		none	MINOR/ MAJOR(a)	ON	

1 Run the Short Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. In the context of the Stratum 3 clock, an OFF-BOARD alarm occurs when there is a DS1 facility problem; otherwise, the alarm is ON-BOARD indicating that there is a fault in the Stratum 3 clock or in the connection between the Stratum 3 clock and the PBX (Private Branch Exchange) switch. If the Stratum 3 clock cannot be referenced, and therefore the local oscillator on the TN780 Tone-Clock circuit pack must serve as the reference instead, a Major alarm is raised. Otherwise, a Minor alarm is raised.

b. This error can be caused by one of the following conditions:

   1. One or both TOCs (Timing Output Cards) may have failed,
   2. the connection between the Stratum 3 clock and the TN780 Tone-Clock circuit pack may be faulty, or
   3. the TN780 Tone-Clock circuit pack may be defective.

A Minor alarm results if the Stratum 3 clock can still provide timing to the PBX; otherwise, a Major alarm is raised because the Stratum 3 clock is not providing timing and the PBX is referencing the local oscillator on the TN780 Tone-Clock circuit pack. If only the Active TN780 Tone-Clock circuit pack were faulty, the Standby TN780 Tone-Clock circuit pack would become active and still synchronize to the Stratum 3 clock. When the system switches to the Standby Tone-Clock circuit pack, the alarm is resolved, and it raises a TDM-CLK (TDM Bus Clock) alarm to indicate that the TN780 Tone-Clock circuit pack may be defective.

If the alarm is minor:

Look for a red LED on either or both TOC cards. If there is a red LED, then replace the card. If there is no red LED, then, using the *Stratum 3 Wiring Guide*, check that the wiring installation is correct. After replacing the card or correctly rewiring the installation, clear the alarm by first issuing the **disable synchronization-switch** command followed by the **enable synchronization-switch** command. Wait two minutes and then execute the **status synchronization** command. If Maintenance Name on the status screen shows "STRAT-3," then the problem is resolved. If not, then escalate the problem.

If the alarm is major:

Check connections between the Stratum 3 clock and the PBX. If there are no loose connections, using the *Stratum 3 Wiring Guide*, check that the wiring installation is correct. After reconnecting the loose connection or correctly rewiring it, clear the alarm by first issuing the **disable synchronization-switch** command followed by the **enable synchronization-switch** command. Wait one minute, and then execute the **status synchronization** command. If Maintenance Name on the status screen shows "STRAT-3," then the problem is resolved. If not, then escalate the problem.

If the Standby Tone-Clock circuit pack become active:

Check connection between the Stratum 3 clock and the TN780 Tone-Clock circuit pack from which the system has just switched. If there are no loose connections, then, replace the TN780 Tone-Clock circuit pack. Refer to the "How to Replace a Tone-Clock Circuit Pack" section in the TDM-CLK (TDM Bus Clock) Maintenance documentation. Before switching back to the new TN780 Tone-Clock circuit pack, use the **test tone-clock PC long** command to check that the Tone-Clock is receiving a signal from the Stratum 3 clock. The notation "PC" denotes a port network number and carrier. If all tests pass, switch to the new Tone-Clock circuit pack via the **set tone-clock PC override** command. If Test #651 fails, then the original TN780 Tone-Clock should be reinserted, and the cable between the Stratum 3 clock and the TN780 Tone-Clock circuit pack should be replaced. If Test #651 continues to fail, then escalate the problem.

c. This error indicates that the Tone/Clock circuit pack in the master port network is not a TN780 Tone/Clock circuit pack when a Stratum 3 clock is administered. Verify that the Tone/Clock in the master port network is TN780.

d. This error indicates that the Stratum 3 clock has either reference A or CI card A failed. Please refer to the error code 1 in the test description of the Test #649 for the repair procedure.

e. This error indicates that the Stratum 3 clock has one power supply failed. Please refer to the error code 2 in the test description of the Test #649 for the repair procedure.

f. This error indicates that the Stratum 3 clock has one clock unit failed. Please refer to the error code 4 in the test description of the Test #649 for the repair procedure.

g. This error indicates that the Stratum 3 clock has either reference B or CI card B failed. Please refer to the error code 8 in the test description of the Test #649 for the repair procedure.

h. This error indicates that the Stratum 3 clock has all power supplies failed. Please refer to the error code 16 in the test description of the Test #649 for the repair procedure.

i. This error indicates that the Stratum 3 clock has all clock units failed. Please refer to the error code 32 in the test description of the Test #649 for the repair procedure.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Stratum 3 Clock Alarm Query Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Stratum 3 Clock Alarm Query (#649)	X	X	ND

1 D = Destructive; ND = Nondestructive

Stratum 3 Clock Alarm Query (#649)

The Stratum 3 clock provides the system with the following six alarm indications via the TN780 Tone-Clock circuit pack:

1. Reference A failed or CI card A failed.
2. Reference B failed or CI card B failed.
3. One power supply failed.
4. All power supplies failed.
5. One clock unit failed.
6. All clock unit(s) failed.

This test queries the Stratum 3 clock for its alarm status (through the TN780 Tone-Clock circuit pack) and reports the results of the query.

WARNING:
The removal of a card in the Stratum 3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum 3 clock to full service.

Table 11-328. TEST #649 Stratum 3 Clock Alarm Query

Error Code	Test Result	Description/ Recommendation
1001	ABORT	The system could not allocate the necessary resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	This test aborts when it is run on a Stratum 4 system. Do not change synchronization to Stratum 3 without consulting the synchronization plan administrator for this switch.

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Table 11-328. TEST #649 Stratum 3 Clock Alarm Query — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	Either Reference A failed or CI card A failed. This condition usually indicates a failure of the DS1 reference; however, there may also be a failure of the CI card to which the reference is connected. System Technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure. If you are NOT ON-SITE, use the following procedure: 1. Look for DS1-BD (DS1 Interface Circuit Pack) errors using the **display error** command. Refer to the DS1-BD Maintenance documentation for recommended strategy to resolve any DS1-BD errors found. 2. If there are no DS1-BD errors OR after resolving all DS1-BD errors, issue the **test synchronization r 4** command to determine if the alarm is still present. If all repetitions of the tests pass, then the alarm no longer exists. Otherwise, system technician should be dispatched with a spare CI card to use the following instructions on-site. If you are ON-SITE, use the following procedure: 1. Look for a red LED on CI card A (that is, the left CI card). If there is a red LED, then replace the CI card, if a spare is available. If no spare CI is available on-site, proceed to Step 3. If after replacing the CI card, the red LED on the new CI card lights also, then proceed to Step 3. 2. If a spare CI card is available, replace the suspect CI card. Otherwise, issue the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures.

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Table 11-328. TEST #649 Stratum 3 Clock Alarm Query — *Continued*

Error Code	Test Result	Description/ Recommendation
1 *(cont'd.)*	FAIL	3. Look for DS1-BD (DS1 Interface Circuit Pack) errors using the **display error** command. Refer to the DS1-BD Maintenance documentation for recommended strategy to resolve any DS1-BD errors found. If there are no DS1-BD errors, proceed to Step 5. 4. After all DS1-BD errors have been resolved, determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures. 5. Check the DS1 reference A connections to the Stratum 3 clock. 6. Determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures. If the problem persists after you have performed this procedure three times, follow normal escalation procedures.
2	FAIL	One power supply failed. This error only occurs when the Stratum 3 clock has two power supplies, and one of them has failed. However, the clock can function with one power supply. 1. Locate the failed power supply by looking for a power supply with a red LED and replace it. 2. Determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, then follow the procedures for those test failures. If the problem persists after you have performed this procedure three times, then follow normal escalation procedures.

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Table 11-328. TEST #649 Stratum 3 Clock Alarm Query — *Continued*

Error Code	Test Result	Description/ Recommendation
4	FAIL	One clock unit failed. 1. Look at the Stratum 3 cabinet for a red LED on a circuit card marked "ST3." Replace the card. 2. Determine if the alarm still exists by issuing the **test synchronization r 4** to clear the alarm. If any test repetitions fail, follow the procedures for those failures. If the problem persists after you have performed this procedure three times, follow normal escalation procedures.
8	FAIL	Reference B failed or CI card B failed. This condition usually indicates a failure of the DS1 reference; however, there may also be a failure of the CI card to which the reference is connected. System Technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure. If you are NOT ON-SITE, use the following procedure: 1. If there are no DS1-BD errors OR after resolving all DS1-BD errors, issue the **test synchronization r 4** command to determine if the alarm is still present. If all repetitions of the tests pass, the alarm no longer exists. Otherwise, system technician should be dispatched with a spare CI card to use the following instructions on-site. If you are ON-SITE, use the following procedure: 1. Look for a red LED on a CI card B (the right CI card). If there is a red LED, replace the CI card, if a spare is available. If no spare CI is available on-site, proceed to Step 3. If after replacing the CI card, the red LED on the new CI card lights also, proceed to Step 3. 2. Otherwise, issue the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures.

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Table 11-328. TEST #649 Stratum 3 Clock Alarm Query — *Continued*

Error Code	Test Result	Description/ Recommendation
8 *(cont'd.)*	FAIL	3. Look for DS1-BD (DS1 Interface Circuit Pack) errors using the **display error** command. Refer to the DS1-BD Maintenance documentation for recommended strategy to resolve any DS1-BD errors found. If there are no DS1-BD errors, proceed to Step 5. 4. After all DS1-BD errors have been resolved, determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures. 5. Check the DS1 reference A connections to the Stratum 3 clock. 6. Determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures. If the problem persists after you have performed this procedure three times, follow normal escalation procedures.
16	FAIL	All power supplies failed. 1. Replace the failed power supplies. 2. If battery backup for the Stratum 3 clock is not supplied or if the battery backup holdover time has been exceeded, the system references the local oscillator on the Active TN780 Tone-Clock circuit pack until software detects one or both power supplies has(have) been restored (approximately 40 minutes). To speed up this restoration, issue the **test synchronization r 4** command. All tests should pass. If any repetitions should fail, follow the procedures for those failures. If the problem persists after you have performed this procedure three times, follow normal escalation procedures.

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Table 11-328. TEST #649 Stratum 3 Clock Alarm Query — *Continued*

Error Code	Test Result	Description/ Recommendation
32	FAIL	All clock unit(s) failed. 1. Look at the Stratum 3 cabinet for red LEDs on circuit cards marked "ST3." Replace the card(s). 2. Determine if the alarm still exists by issuing the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, follow the procedure for those failures. If the problem persists after you have performed this procedure three times, follow normal escalation procedures.
2101	FAIL	The TN780 Tone-Clock circuit pack detects loss of signal. Refer to Note (b) of the STRAT-3 Hardware Error Log Entries table in the STRAT-3 (Stratum 3 Clock) Maintenance documentation for replacement procedures.
	PASS	The Stratum 3 clock has reported that it has no alarm conditions. If synchronization problems have been reported, look for SYNC errors and refer to SYNC (Synchronization) Maintenance documentation for recommended strategy for those errors.

SVC-SLOT (Service Slot)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SVC-SLOT	MINOR	none	Service Slot

The Service Slot maintenance object is used to detect when an invalid circuit pack is inserted into a SERVICE slot. The SERVICE slot is the leftmost slot in the J58890BB Port Carrier. It is identified as circuit pack slot location "00" in all commands, field entries, and displays used by the system administrator and the service technician.

This slot does not provide tip and ring connectivity to the wall field. Therefore, only the following circuit pack types are allowed in the slot:

- Call Classifier (TN744)
- Integrated Announcement (TN750)
- Maintenance/Test (TN771C)
- Speech Synthesizer (TN725B)
- Tone Detector (TN748C)

A MINOR alarm is generated against the Service Slot maintenance object when a circuit pack of a type other than that included in the previous list is inserted into a SERVICE slot.

The Service Slot maintenance object name is used instead of the maintenance object name for the illegal circuit pack to prevent any attempt to assign a port to an illegal circuit pack that is physically inserted into the SERVICE slot.

Hardware Error Log Entries and Test to Clear Values

Service Slot Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
600 (a)		None	MINOR	ON	

Notes:

a. This error type indicates that a circuit pack type other than one of the following types was inserted into slot 00 (SERVICE slot) of the J58890BB port carrier.

- Call Classifier (TN744)
- Integrated Announcement (TN750)
- Maintenance/Test (TN771C)
- Speech Synthesizer (TN725B)
- Tone Detector (TN748C)

The code of the invalid circuit pack can be displayed by using the **list configuration board UUCSS** command, where "UU" is the universal cabinet number, "C" is the carrier number, and "SS" is the slot number (always 00) of the alarmed circuit pack.

Remove the invalid circuit pack to retire the alarm.

SW-CTL (Switch Control)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SW-CTL	MINOR	test network-control a/b sh	Switch Control
SW-CTL	MAJOR	test network-control a/b sh	Switch Control

The Switch Control resides on the TN777 Network Control (Netcon) circuit pack. The data channels (DATA-BD and DATA-CHL) also reside on the Netcon circuit pack. Standard systems have a single Netcon circuit pack and High and Critical Reliability systems have a Netcon circuit pack in each SPE complex. The Netcon in a standard system cannot be replaced without bringing the system down. The Netcon in the standby SPE of a High or Critical Reliability system can be changed without affecting normal system operation.

The Switch Control is used to send control information between port circuit packs and the processor (see Figure 11-96). This control information is sent via the PPN cabinet's Time Division Multiplex (TDM) Bus. The portion of the TDM Bus used to transmit control messages is called the control channel. The control channel can be on either TDM Bus A or TDM Bus B, but only one bus is used for the control channel at any given time.

The Switch Control is critical in the setup and takedown of all calls but is not involved in the voice or data transmission that takes place during established calls. It is the Switch Control that detects when port circuit packs are plugged into or removed from the PPN cabinet. This information is then sent to the processor. The Switch Control monitors the health of the control channel on the PPN cabinet TDM Bus and informs the processor when errors occur.

The Switch Control contains the hardware Time of Day (TIME-DAY) clock that the system uses for all its date and time information. In addition, the Switch Control also contains hardware to monitor critical system timing signals and informs the processor when these signals fail. For example, if the timing signals from a Tone-Clock circuit pack in the PPN cabinet fail, the Switch Control informs the processor, and the processor can switch in a spare Tone-Clock circuit pack, if one is available (High or Critical Reliability system).

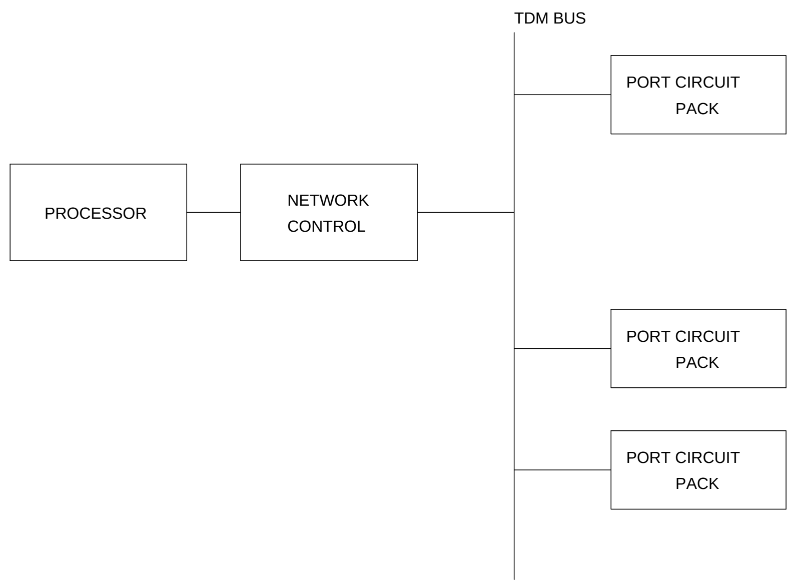

Figure 11-96. Switch Control Connectivity

Hardware Error Log Entries and Test to Clear Values

Switch Control Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test network-control a/b sh r 1
1	Any	Control Channel Test (#94)	MAJOR	ON	test network-control a/b r 3
2 (a)		Control Channel Test (#94)	MAJOR	ON	test network control a/b r 3
257 (b)	0 or 1	None			
513	(c)	Time of Day Clock Test (#95)	MINOR	ON	test network-control a/b l r 3
769 (d)	Any	None			
1025		Switch Control Loop Around Test (#92)	MAJOR	ON	test network-control a/b r 3
1281 (e)	Any	None			
1537		Switch Control Reset Test #93	MAJOR	ON	test network-control a/b l r 2
1793 (f)	Any	None			
2817		MCD Loop Around Test (#324)	MAJOR	ON	test network-control a/b r 2
3073		MCD Memory Test (#325)	MAJOR	ON	test network-control a/b r 3
3329 (g)		None	MAJOR	ON	(g)

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. This error may not cause a Switch Control alarm if Error Type 769 is also present since this error may actually be caused by the loss of clock signals and not by a Switch Control failure.

b. The 257 errors are reported to the processor by the Switch Control and indicate possible hardware problems on the Network Control circuit pack. The receipt of these errors causes Switch Control maintenance to run specific Switch Control tests. If there really is a problem, the Switch Control tests usually causes other errors to be logged. In the rare case where no other errors are logged but 257 errors are occurring at a high rate (more than 10 in the last hour), the Network Control circuit pack should be replaced at the customer's convenience.

c. If the Aux Data is less than 100, the test may have been interrupted by LMM operations. Wait one minute, then test again. Retry the test a maximum of three times. If the Aux Data is more than 100 or fails two out of three times with Aux Data less than 100, the Netcon circuit pack needs to be replaced.

d. A 769 error occurs when the Switch Control reports a loss of timing signals to the processor. When this error is present, the Switch Control is usually not alarmed since any Switch Control test failures are really the result of faulty signals from the PPN cabinet Tone-Clock circuit pack. See TDM-CLK (TDM Bus Clock) Maintenance documentation for the procedures needed to diagnose Tone-Clock circuit pack troubles.

e. This error indicates a loss of handshake between SW-CTL and the system software. Look for and resolve all other SW-CTL errors. In the rare case where no other errors are logged, but Error Type 1281 is occurring at a high rate (more than 10 in the previous hour), escalate the problem.

   For G3s, a loss of handshake between Switch Control in Network Control circuit pack (TN777B) and Processor circuit pack (TN786B or TN790) can be caused by the following components: Network Control circuit pack (TN777B), Processor circuit pack (TN786), Processor Interface circuit pack (TN765), Packet Control circuit pack (TN778), and M-BUS.

   Follow these repair steps:

   1. Look for and resolve all other SW-CTL errors.
   2. Look for and resolve all other PI-SCI, PI-BD, and PKT-CTRL errors.
   3. If the error indicates a failure in the Network Control circuit pack, Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions to replace the Network Control circuit pack. Boot the system up after the Network Control circuit pack has been inserted successfully into the control carrier.
   4. If the error of loss of handshake persists after the replacement of the Network Control circuit pack, then refer to Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions to replace the Processor circuit pack.

      Refer to the "Software Upgrade" section in Chapter 5, "Routine Maintenance Procedures", to load the system software from the Memory Card (J58890TG-1 List 3) with the correct software release into the Processor circuit pack. Boot the system up after the system software is successfully loaded into the Processor circuit pack.
   5. If the error of loss of handshake persists after the replacement of the Processor circuit pack, then escalate the problem and consider the replacement of the control carrier. It's possible that the M-bus on the backplane of the control carrier may be defective.

Recommended Repair Kits: Network Control circuit pack (TN777B), Processor circuit pack (TN786B or TN790), and Memory Card (J58890TG-1 List 3) with correct software release.

f. The Aux Data for this error is not meaningful. The 1793 errors are in-line errors that indicate a possible problem with the interface between the Switch Control and the processor. The receipt of these errors causes Switch Control maintenance to run specific Switch Control tests. If there really is a problem, the Switch Control tests usually causes other errors to be logged. In the rare case where no other errors are logged but 1793 errors are occurring at a high rate (more than 10 in the last hour), the Network Control circuit pack should be replaced at the customer's convenience.

g. This error indicates bad clock detection circuitry on the Netcon circuit pack. Replace the Netcon circuit pack according to the control carrier circuit pack replacement procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Switch Control Reset Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Switch Control Reset Test (#93)		X	D
Control Channel Interface Test (#92)	X	X	ND
Control Channel Transmission Test (#94)	X	X	ND
Destructive EPN Maintenance Board Interface Test (#325)		X	D
EPN Maintenance Board Interface Test (#324)	X	X	ND
Time of Day Clock Test (#95)	X	X	ND
Control Channel Loop Around Test (DATA-BD) (#52) (a)	X	X	ND
NPE Audit Test (DATA-BD) (#50) (a)		X	ND
Data Channel Reset Test (DATA-CHL) (#107) (b)		X	D
Data Channel Interface Test (DATA-CHL) (#108) (b)		X	D
Maintenance Loop Around Test (DATA-CHL) (#109) (b)	X	X	ND
Data Channel Crosstalk Test (DATA-CHL) (#110) (b)	X	X	ND
Data Channel Local Loop Back Test (DATA-CHL) (#111) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation for a description of these tests.

b. Refer to DATA-CHL (Network Control Channel) Maintenance documentation for a description of these tests.

Control Channel Interface Test (#92)

Loop back messages are sent to the Switch Control via the interface used for control channel messages. The messages are returned to the SPE for verification via the same interface.

Table 11-329. TEST #92 Control Channel Interface Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-329. TEST #92 Control Channel Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
other	FAIL	Messages could not be looped back through the control channel interface. If this is a standard system, the customer probably cannot make or receive calls. 1. This failure could be due to either a Netcon circuit pack hardware failure or the loss of system timing signals. If the Switch Control is alarmed, then a Netcon circuit pack failure should be suspected. If the Switch Control is not alarmed, investigate the possibility of the loss of system timing signals before attempting to replace the Netcon circuit pack. Test #94 also fails if the system timing signals are lost. If Test #94 passes, do not suspect the loss of timing signals. 2. Run the Short Test Sequence several times to make sure that this failure is occurring consistently, run the Long Test Sequence to reset the Switch Control. Sometimes running the Long Test Sequence may clear the problem. If the test is still failing, proceed to Step 3 or 4. 3. If the system is still able to process calls, replace the Netcon circuit pack at the customer's convenience (Standard system) or right away (High or Critical Reliability system). 4. If calls cannot be made, replace the Netcon circuit pack immediately. 5. The procedure for replacing the Network Control circuit pack (DATA-BD) in a High or Critical Reliability system is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The control channel interface between the processor and the Switch Control is working correctly.

Switch Control Reset Test (#93)

This test is destructive.

This test resets the Switch Control and determines if it can successfully go through its initialization sequence. The test is destructive since there is the possibility of losing some control messages to or from port circuit packs.

Table 11-330. TEST #93 Switch Control Reset Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to Standby SPE Maintenance documentation for a description of these error codes.

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Table 11-330. TEST #93 Switch Control Reset Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000 or None	FAIL	The Switch Control could not be successfully reset. If this is a standard system, the customer probably cannot make or receive calls. 1. This failure could be due to either a Network Control circuit pack hardware failure or the loss of system timing signals. If the Switch Control is alarmed, then a Network Control circuit pack failure should be suspected. If the Switch Control is not alarmed, then investigate the possibility of the loss of system timing signals. See TDM-CLK (TDM Bus Clock) Maintenance documentation. If many port circuit pack LEDs are lit, suspect a TDM Bus Clock problem. If only the Network Control circuit pack LED is lit, suspect the Network Control circuit pack. If the Network Control circuit pack is determined to be at fault, proceed to Step 2. 2. If the system is still able to process calls, replace the Netcon circuit pack at the customer's convenience (Standard system) or right away (High or Critical Reliability system). 3. If calls cannot be made, replace the Netcon circuit pack immediately. 4. The procedure for replacing the Netcon circuit pack in a High or Critical Reliability system is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The Switch Control has initialized correctly. Look at results of the other tests to see if it is operating correctly.

Control Channel Transmission Test (#94)

Control channel messages are sent from the SPE to selected port circuit packs and the response from the port circuit packs is checked. This tests the ability of the Switch Control to send and receive messages on the control channel of the TDM Bus.

This test cannot run on the Standby SPE Switch Control. Therefore, it is possible to have defective hardware on the Standby Network Control circuit pack that is not detectable.

Table 11-331. TEST #94 Control Channel Transmission Test

Error Code	Test Result	Description/ Recommendation
0	ABORT	The port circuit packs necessary for this test are not available. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test keeps aborting for this reason, then the Network Control circuit pack should be replaced.
1030	ABORT	The Switch Control on the Standby SPE is being tested. 1. For recommended maintenance procedure, refer to ABORT Error Code 1030 in STBY-SPE Maintenance documentation.
2012	ABORT	Internal System Error.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.

Continued on next page

Table 11-331. TEST #94 Control Channel Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	FAIL	The Switch Control cannot communicate on the TDM Bus control channel. The customer probably cannot make or receive calls. 1. Run the Short Test Sequence several times to make sure this failure is occurring consistently, run the Long Test Sequence to reset the Switch Control. Sometimes, running the Long Test Sequence may clear the problem. Remember that the Long Test Sequence is **destructive**. Placing and receiving calls is affected for several seconds. 2. If there are no TDM Bus alarms against the Standby TDM Bus, switch the control channel from its current bus to the Standby bus. If this test passes on the new bus, investigate the possibility of TDM Bus failures. If the test fails even after the control channel is switched to the standby TDM Bus, proceed to Step 3 or 4. 3. If the system is still able to process calls, replace the Netcon circuit pack at the customer’s convenience (Standard system) or right away (High or Critical Reliability system). 4. If calls cannot be made, replace the Netcon circuit pack immediately. 5. The procedure for replacing the Netcon circuit pack in a High or Critical Reliability system is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The Switch Control can communicate with the port circuit packs over the TDM Bus.

Time of Day Clock Test (#95)

The short term accuracy of the Time of Day (TIME-DAY) clock is tested. The test reads the clock once, waits a short time, and reads the clock again. The second reading of the clock must be within certain limits relative to the first reading for the test to pass. The **display time** command can be used to display the current setting of the TIME-DAY clock.

Table 11-332. TEST #95 Time of Day Clock Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	The test was interrupted by a higher priority task. 1. Rerun the test at one-minute intervals a maximum of five times. 2. If the test aborts five times, wait until the system is less heavily used and rerun the test at that time. 3. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
2012	ABORT	Internal System Error.
2013	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-332. TEST #95 Time of Day Clock Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2001	FAIL	The Time of Day clock could not be read. 1. Run the **set time** command and set the time to the current time. 2. Run the Short Test Sequence several times to determine if setting the time corrected the error. Proceed to Step 3 if the error is still occurring. 3. Replace the Netcon circuit pack at the customer's convenience (Standard system) or right away (High or Critical Reliability system).
other	FAIL	The accuracy of Time of Day clock is not within limits. 1. Run the Short Test Sequence several times to make sure the error is occurring consistently. 2. Replace the Network Control (DATA-BD) circuit pack at the customer's convenience (unduplicated system) or right away (High or Critical Reliability system). 3. The procedure for replacing the Network Control (DATA-BD) circuit pack is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The Time of Day clock on the Switch Control circuit pack is operating correctly.

Switch Control EPN Maintenance Board Interface Test (#324)

Loop back messages are sent to the Switch Control via the interface used for EPN maintenance circuit pack messages. The messages are returned to the SPE for verification via the same interface.

Table 11-333. TEST #324 Switch Control EPN Maintenance Board Interface Test

Error Code	Test Result	Description/ Recommendation
1005	ABORT	The system does not contain an EPN so this test is not executed.
1030	ABORT	The component on which the test was to be run is on the Standby SPE. This test may only be run on this component when it resides on the Active SPE. 1. For recommended maintenance procedure, refer to ABORT Error Code 1030 in STBY-SPE Maintenance documentation.
32400	ABORT	Test disabled via software patch. 1. Escalate to the next tier level for instructions on enabling test.
2012 32413 32416 32423 32425	ABORT	Internal System Error.
2013 32411 32421	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
32414 32417 32424 32427	ABORT	The messages failed to return (timed out) and were not verified. 1. Retry the command at one-minute intervals for a maximum of five retries. 2. If the test continues to abort and SW-CTL Test #325 passes, there is not a problem, but if SW-CTL Test #325 fails, follow the recommendations for SW-CTL Test #325.

Continued on next page

Table 11-333. TEST #324 Switch Control EPN Maintenance Board Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to Standby SPE Maintenance documentation for a description of these error codes.
	ABORT	Refer to STBY-SPE Maintenance documentation for a description of these error codes.
any	FAIL	This failure indicates that communications with the Maintenance circuit pack in the EPN is probably not possible. The EPN Manager I may not be usable. 1. Run the Short Test Sequence several times to make sure the error is occurring consistently, run the Long Test Sequence to reset the Switch Control. Sometimes running the Long Test Sequence may clear the problem. Remember the Long Test Sequence is **destructive**. Placing and receiving calls is affected for several seconds. 2. Replace the Netcon circuit pack whenever it is convenient for the customer (unduplicated system) or right away (High or Critical Reliability system). 3. The procedure for replacing the Netcon circuit pack is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The EPN Maintenance circuit pack interface between the processor and the Switch Control is working correctly. Test #325 is a more thorough test of this interface but it is **destructive**.

Switch Control Destructive EPN Maintenance Board Interface Test (#325)

This test is destructive.

This test writes test patterns into the EPN Maintenance circuit pack interface and verifies that it can read back these test patterns successfully. Messages to or from the EPN Maintenance circuit pack can be lost when this test is run.

Table 11-334. TEST #325 Switch Control Destructive EPN Maintenance Board Interface Test

Error Code	Test Result	Description/ Recommendation
1005	ABORT	The system does not contain an EPN so this test is not executed.
32500	ABORT	Test disabled via software patch. 1. Escalate to the next tier level for instructions on enabling test.
2013 32511	ABORT	Could not allocate the system resources to run for this test.
2012 32513 32514	ABORT	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1029 2014 2015 2016 2017 2018 2020 2022 2024 2025 2051	ABORT	Refer to Standby SPE Maintenance documentation for a description of these error codes.

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Table 11-334. TEST #325 Switch Control Destructive EPN Maintenance Board Interface Test — *Continued*

Error Code	Test Result	Description/ Recommendation
32515	FAIL	This failure indicates that communications with the Maintenance circuit pack in the EPN is probably not possible. The EPN Manager I may not be usable. 1. Run the Long Test Sequence several times to make sure the error is occurring consistently. Remember the Long Test Sequence is **destructive**. Placing and receiving calls is affected for several seconds. 2. Replace the Netcon circuit pack whenever it is convenient for the customer (unduplicated system) or right away (High or Critical Reliability system). 3. The procedure for replacing the Netcon circuit pack is described in Chapter 8, "Reliability Systems: A Maintenance Aid". The procedure for doing the same in systems without High or Critical Reliability is described in Chapter 5, "Routine Maintenance Procedures".
	PASS	The EPN Maintenance circuit pack interface between the processor and the Switch Control is working correctly.

(Synchronization)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SYNC	MAJOR	display errors	Synchronization Maintenance
SYNC	MINOR	display errors	Synchronization Maintenance
SYNC	WARNING	test synchronization	Synchronization Maintenance

The Synchronization Maintenance is composed of both hardware and software components and its purpose is to provide a common reference frequency for reliable digital communication between Generic 1 systems and other PBXs, COs or CPE. Synchronization is achieved via the use of several system components which include the Tone-Clock (TN768 or TN780), the DS1 Interface (TN722, TN767 or TN464 [G3iV2-386]), and the Expansion Interface (TN776 or TN570) circuit packs. Synchronization is achieved between the Processor Port Network (PPN) and the Expansion Port Networks (EPNs) via the Expansion Interface Link (EXP-LINK) between the networks. The TN570 and TN780 circuit packs are supported by G3iV1.1-286 and G3iV2-386. Depending on the network synchronization plan and the status of synchronization sources, the system timing reference may be a Tone-Clock circuit pack, DS1 interface circuit packs or an external Stratum 3 clock. Stratum 4 synchronization extracts timing information directly from a DS1 reference or from a Tone-Clock. Stratum 3 synchronization requires the use of a Stratum 3 clock which provides a timing signal, derived from DS1 references, to the TN780 Tone-Clock circuit pack. The external Stratum 3 clock is a more stable timing source than the Stratum 4 clock and provides 24-hour holdover in case of reference failures. The Stratum 3 clock has redundant components. Stratum 3 synchronization is available as an option for G3iV1.1-286 and G3iV2-386. Synchronization maintenance in DEFINITY Generic 1 is the same as that for G3iV1.1-286 and G3iV2-386 except for the use of Error Types 1793 and 2305, the support of the second EPN, and the Stratum 3 clock.

Stratum 4 Synchronization

The system can be configured with primary and secondary synchronization references (DS1 interface circuit packs) when using Stratum 4 synchronization. Both references are optional (since the local oscillator can be used), and the secondary reference is optional if a primary is provided. If this system is the master for the network, then its local oscillator would be used and no DS1s would be used as references.

If the primary synchronization reference is not providing a valid timing signal, the system automatically switches to the secondary synchronization reference. If the secondary reference does not provide a valid timing signal or is not administered as a synchronization reference, a Tone-Clock circuit pack provides the system timing source. The system does not revert to the primary if the current reference is the secondary and is failing; however the system switches from the local oscillator to another reference when the new reference becomes available. The following diagram should assist in understanding Stratum 4 Synchronization Maintenance components within the system. This diagram depicts a possible Generic 1.2 configuration; DEFINITY Generic 1 does not support two EPNs, but the operation and maintenance described below is the same except for the references to multiple EPNs.

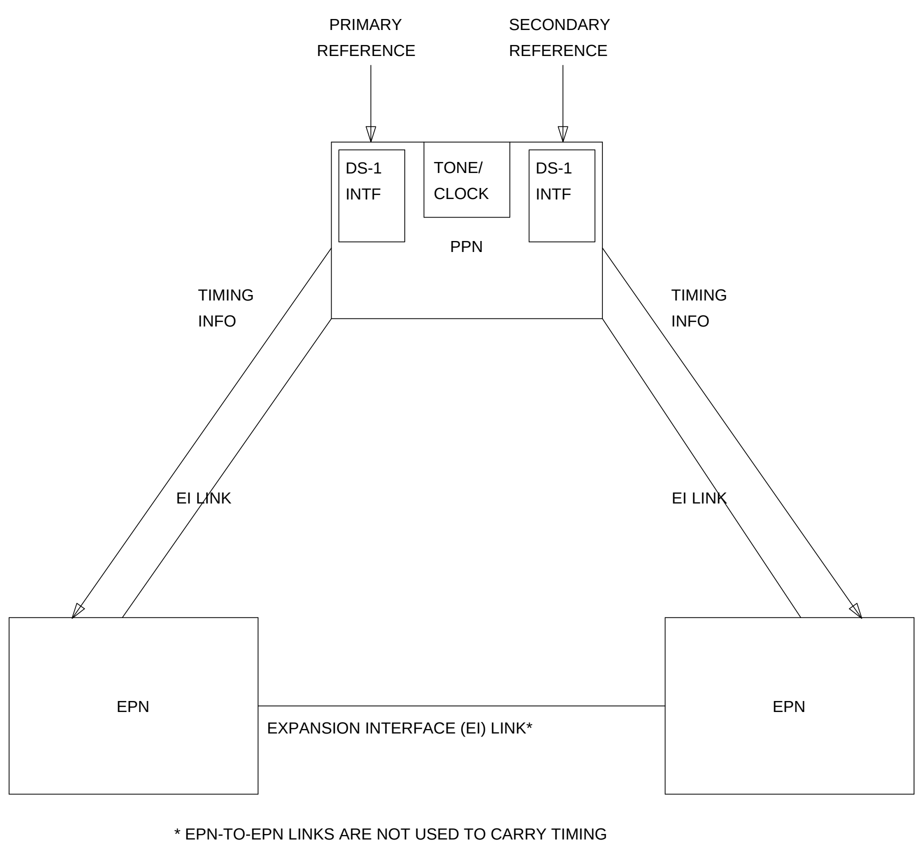

Figure 11-97. Typical Stratum 4 Synchronization Configuration

If the primary synchronization reference in the previous diagram is providing a valid timing signal, then the flow of system synchronization would travel from the

DS1 interface circuit pack in the PPN across the active Expansion Interface fiber link to the two EPNs. The PPNDS1 interface circuit pack provides a timing signal for the PPN Tone-Clock circuit pack and the PPN Tone-Clock circuit pack provides timing for all circuit packs in the PPN. The PPN Expansion Interface circuit pack uses the timing generated by the Tone-Clock circuit pack to generate a data stream which is sent across the Expansion Interface link to the Expansion Interface circuit packs in the two EPNs. The EPN Expansion Interface circuit pack uses the received data stream to generate a timing signal. The Tone-Clock circuit pack in the EPNs uses this signal to generate timing for all the circuit packs in their respective EPNs. The PPN, in the above mentioned scenario, is designated the *master* port network and the EPNs are called *slave* port networks. The *master* port network is defined as the port network that contains the system synchronization source. If the primary synchronization reference does not provide a valid timing signal, Synchronization Maintenance switches to the secondary reference. **Both the primary and secondary references must reside in the same port network, but there is no restriction as to in which port network both must reside (that is, both references may be in an EPN). The recommended placement of the references is in the PPN.**

There are two kinds of Stratum 4 synchronization that are supported: Type I and Type II. Stratum 4 type I is more stable than Type II and provides some switching capability at the hardware level. Stratum 4 Type II operation is the only synchronization strata provided by Generic 1. It is important to note that Stratum 4 Type I operation is not possible when one or both of the DS1 interface circuit packs providing the reference sources is a TN722. Both must be the TN767 or TN464 (suffix C or higher) [G3iV2-386].

Stratum 3 Types I and II are available with Generic 1, G3iV1.1-286, and G3iV2-386 systems. Stratum 4 Type I is not available for pre-Generic 1 releases. Both Type I and Type II operation are possible with the TN768 and TN780 Tone-Clock circuit packs.

Stratum 3 Synchronization

The following diagram may help you to understand the synchronization components needed for Stratum 3 synchronization.

NOTE:
This is only one possible configuration.

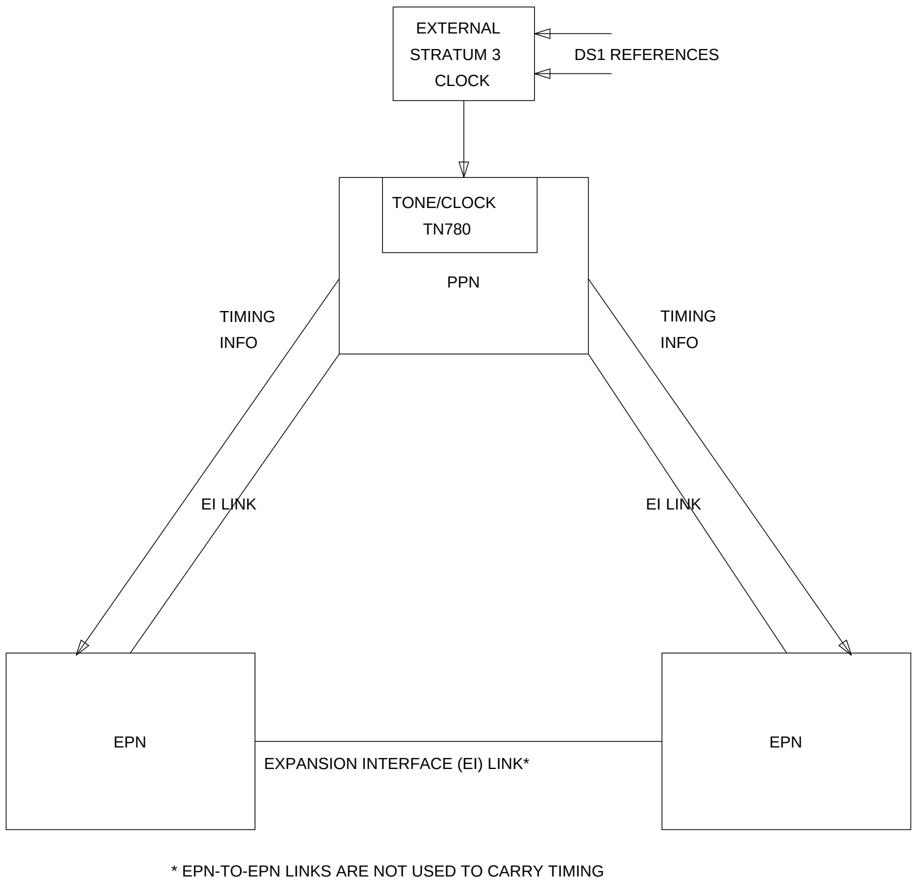

Figure 11-98. Example Stratum 3 Synchronization Configuration

For Stratum 3 synchronization, an external clock provides a timing signal to a TN780 Tone-Clock circuit pack, and the TN780 provides timing to all circuit packs in the port network in which the TN780 resides (that is, the PPN in the previous diagram). The PPN Expansion Interface circuit pack uses the timing generated by the TN780 to generate a data stream which is sent across the two Expansion Interface Links to the two EPNs to the EPN Expansion Interface circuit packs. The EPN Expansion Interface circuit packs use the received data stream to generate a timing signal which is used by the Tone-Clock circuit packs in the EPNs to provide timing for all circuit packs in both EPNs. (The Tone-Clock circuit pack is not necessarily a TN780; only the Tone-Clock circuit pack connected to the external Stratum 3 clock must be a TN780.) The PPN, in the above mentioned scenario, is designated the *master* port network and the EPNs are called *slave* port networks. The *master* port network is defined as the port network whose Tone-Clock is connected to the Stratum 3 clock.

NOTE:
The Stratum 4 equipment (usually a PBX) should never provide timing to a Stratum 3 PBX.

NOTE:
The external Stratum 3 clock may be connected to the TN780 Tone-Clock in any port network. However, it is recommended that it be connected to the PPN.

Synchronization Troubleshooting

For both Stratum 3 and 4 operation, major and minor alarms indicate that there is a problem with the system synchronization references. These alarms are resolved when the alarmed synchronization reference is restored.

The **status synchronization** and **display synchronization** commands are used to determine the current system synchronization reference and the primary and secondary references that are administered respectively.

Other commands associated with Synchronization Maintenance are **disable synchronization-switch** and **enable synchronization-switch.** These commands are used to disable the ability of Synchronization Maintenance to switch between synchronization references and to enable this switching ability, respectively. The **set synchronization** command is executed only after synchronization has been disabled and is used to manually switch to a specific synchronization reference. This command is useful to diagnose synchronization problems by forcing a specific reference (DS1 or Tone-Clock) to be the system synchronization reference to determine if a specific reference is providing a valid timing signal. For Stratum 3 operation, only a TN780 Tone-Clock circuit pack may be specified. To switch synchronization to the Stratum 3 clock, use the **enable synchronization-switch** command after verifying that the Stratum 3 clock is wired correctly.

The system synchronization planner must avoid creating a *timing loop* when administering the primary and secondary synchronization references in a system. A timing loop exists whenever a system receives timing from another system whose timing reference is directly or indirectly derived from itself. Timing loops can lead to loss of digital data between systems that are exchanging data with any system within the loop. An invalid timing signal is also generated by any system within the loop, thus propagating the invalid timing signal to any system(s) using a system within the loop as a synchronization reference. Figure 11-99 shows a timing loop and a correct distribution of timing between the systems.

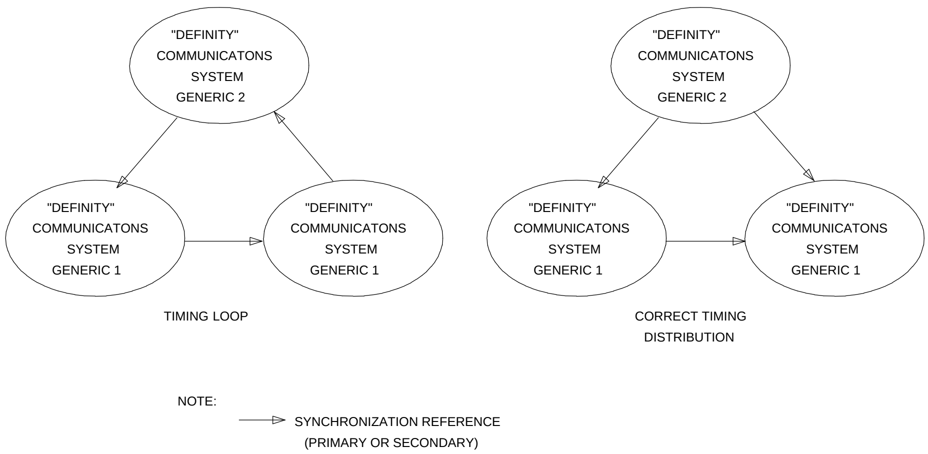

Figure 11-99. Synchronization Timing Loop

A correctly designed network has no loops and each piece of equipment in the network is supplied by a clock of equal or lower stratum (that is, the inputs to a Stratum 3 clock should NEVER be from a Stratum 4 device). **It is strongly recommended that the network administrator be consulted before administering any synchronization changes.**

The yellow LEDs of the TN768 and 780 Tone-Clock circuit packs flash in a specific pattern to indicate the status of the circuit pack. These flashing LED patterns are used to indicate if a Tone-Clock circuit pack is deriving timing from an external source or whether the Tone-Clock circuit pack is providing the timing signal for the port network. The yellow LED patterns for the TN768 and 780 Tone-Clock circuit packs are as follows:

1. Yellow LED is on 2.7 seconds and off .3 seconds—This light pattern indicates that an external timing source is being used as a synchronization reference and the circuit pack is in Active mode.
2. Yellow LED is on .3 seconds and off 2.7 seconds—This light pattern indicates that the local oscillator on the Tone-Clock circuit pack is being used as a synchronization reference and the circuit pack is in Active mode.
3. Yellow LED stays on—This light pattern indicates that the circuit pack has been reset but no translation has been downloaded. This pattern indicates the circuit pack is providing clocks and is in Active mode.
4. Yellow LED off is an indication that the Tone-Clock circuit pack is in Standby mode (neither generating tones nor supplying clocks).

5. The following two patterns may occur when the circuit pack is either in Active or Standby mode. The best approach to determine the mode of the circuit pack is to use the **status system** system technician command.

   - Maintenance running on the Standby circuit pack is indicated by the following pattern (yellow and green LEDs flashing): LED on .1 seconds, off for .2 seconds, on for .1 seconds, off for .4 seconds, on for .4 seconds, off for .4 seconds.

   - Green flashing and yellow flashing in a pattern different than the previously mentioned pattern indicates that maintenance is running on the Active circuit pack.

Hardware Error Log Entries and Test to Clear Values

Synchronization Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test synchronization
1 (a)[1]	Any	None	WARNING/ MINOR(j)[2]	OFF	None
18 (b)	0	disable sync	WARNING	OFF	enable sync
257 (c)[1]	Any	None	WARNING/ MINOR(j)[2]	OFF	None
513 (d)[1]	Any	None	WARNING/ MAJOR(j)[2]	OFF	None
769 (e)		None	MAJOR/ WARNING[3]	OFF	None
1793 (f)[4]	0-50	None	MAJOR/ WARNING	OFF	enable sync
2049 (g)(i)[4]	0	None	WARNING	OFF	None
2305 (h)(i)[4]	0	None	WARNING	OFF	None

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This error type initially raises a Warning alarm. If this error type persists and alarms are not downgraded on this MO due to the value of **set options**, then, after a period of time, a Minor or Major alarm is raised.

3 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

4 It may take up to one hour for these SYNC alarms to clear due to "leaky bucket" strategy.

Notes:

a. This error indicates a problem with the primary DS1 reference. It is cleared when the primary reference is restored. The following steps should give an indication of the source of the problem:

1. Check if the primary DS1 interface circuit pack is inserted in the carrier via the **list configuration board PCSS** command.
2. Check the connection of the cable supplying the external timing source to the primary DS1 interface circuit pack.
3. Test the primary DS1 interface circuit pack via the **test board PCSS long** command. Check the Error Log for DS1-BD errors and refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation to resolve any errors associated with the primary

DS1 interface circuit pack. If no errors are listed in the Error Log for the primary DS1 interface circuit pack, continue with the following steps.

4. Test the active Tone-Clock circuit pack in the master port network via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to the TDM-CLK (TDM Bus Clock) Maintenance documentation to resolve the problem. If not, continue with the following steps.
5. Execute the **disable synchronization-switch** and the **enable synchronization-switch** commands. These two commands (when executed together) switch the system synchronization reference to the primary DS1 interface circuit pack. Check the Error Log and execute the **status synchronization** command to verify that the primary DS1 interface circuit pack is still the system synchronization reference. If the primary DS1 interface circuit pack is not the system synchronization reference, and this is not a High or Critical Reliability system, escalate the problem. If not, continue with the following step.
6. **High or Critical Reliability system:**

   Switch Tone-Clock circuit packs on the master port network via the **set tone/clock PC** command, and repeat the disable/enable commands described in the previous step. If the problem still persists, follow normal escalation procedures.

b. This error indicates that Synchronization Maintenance has been disabled via the **disable synchronization-switch** command. Execute the **enable synchronization-switch** command to enable Synchronization Maintenance reference switching and to resolve this alarm.

c. This error indicates a problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting **secondary** for **primary** in the preceding resolution steps.

d. This error indicates that the Tone-Clock circuit pack is providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

e. This error indicates that the external Stratum 3 Clock fails to provide the system timing reference. Refer to Stratum 3 Clock Maintenance document to resolve the defective synchronization reference.

f. **In Generic 1.1**:

   This error indicates excessive switching of system synchronization references has occurred. When this error occurs, synchronization is disabled and the Tone-Clock circuit pack (in the master port network) becomes the synchronization reference for the system. Execute the following steps to resolve this error:

1. Check for timing loops and resolve any loops that exist.
2. Test the active Tone-Clock circuit pack in the master port network via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to the TDM-CLK (TDM Bus Clock) Maintenance documentation to resolve the problem. If not, continue with the following steps.
3. **High or Critical Reliability system:** Switch Tone-Clock circuit packs on the master port network via the **set tone/clock PC** command.

   Standard system: Replace the primary and secondary (if administered) DS1 Interface circuit packs.
4. Check for an error logged against the primary or secondary DS1 board. If there is an error, follow the DS1 section to resolve the errors. If there is not, enter **enable sync**, and wait for two to five minutes for the primary sync source to come on-line.
5. If the problem still persists, escalate the problem.

   In Generic 3i: This error indicates that some reference switches have occurred. If there is not a major SYNC alarm, then investigate other SYNC errors. If there is an active major SYNC alarm, and if this is not a Stratum 3 system, then follow the steps for Generic 1.

g. This error indicates that the Expansion Interface Link is experiencing timing slips. The two port networks are not synchronized. This error increases the bit error rates for data transmission between port networks. Verify that all the TDM/LAN Bus cables on the backplane are AT&T Parts number AT&T SK00199-001 rather than flat ribbon cables. Also, check that the bus terminators are the ZAHF V1 TDM/LAN Bus Terminator type. Refer to note (i) for error resolution steps.

   This error is cleared by a leaky bucket strategy and takes one hour to clear (leak away) the error counter once it is alarmed. Therefore, it may take up to one hour to clear the alarm after the problem is cleared.

h. This error indicates that the slave Tone-Clock circuit pack is experiencing loss of signal. Refer to note (i) for error resolution steps.

i. The following steps should be executed to resolve error 2049 and 2305:

1. Check for timing loops, and resolve any loops that exist.
2. Check the Error Log for any active as well as resolved Expansion Interface circuit pack errors and refer to EXP-INTF (Expansion Interface Circuit Pack) Maintenance documentation to resolve any errors found.
3. **High or Critical Reliability system:**

- Switch Tone-Clock circuit packs in the slave port network via the **set tone/clock PC** system technician command. The error count for this particular error should start decrementing once the problem is solved—if the count does not decrease in 15 minutes the problem still persists.
- If the problem still persists, switch the Tone-Clock in the slave port network back to the previous configuration. Then, switch Expansion Interface Links via the **set expansion-link PCSS** command.
- If the problem still persists, switch the Expansion Interface Links back to the previous configuration via the **set expansion-link PCSS**. Then, switch the Tone-Clock circuit packs in the master port network.
- If the problem still persists, switch the Tone-Clock circuit packs in the master port network back to the previous configuration. If the system synchronization reference is a Tone-Clock circuit pack, follow normal escalation procedures. If the system synchronization reference is a DS1 interface circuit pack, administer a different DS1 interface circuit pack as the primary synchronization reference. If the problem still is not resolved, follow normal escalation procedures.

4. **Standard system:**—Error 2049:

- Test the Tone-Clock circuit packs in the master and slave port networks via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to TDM-CLK (TDM Bus Clock) Maintenance documentation to resolve the problem. If not, continue with the following steps.
- If the master and slave Tone-Clock circuit packs **do not** fail TDM Bus Clock Test #150 (PPM Inquiry), replace the Expansion Interface circuit packs in the system.
- If the system synchronization reference is a Tone-Clock circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, follow the steps listed in TDM-CLK (TDM Bus Clock) Maintenance documentation to replace the master Tone-Clock circuit pack.
- If the system synchronization reference is a DS1 interface circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, the primary or secondary (if administered) synchronization references are not providing valid timing signals for the system. Check the system synchronization references administered, and follow the steps outlined in note (a) if the primary synchronization

reference is providing timing for the system or note (c) if the secondary synchronization reference is providing timing for the system.

- If the slave Tone-Clock circuit pack fails the TDM Bus Clock Test #150 but the master Tone-Clock **does not** fail this test, the master Tone-Clock circuit pack must be replaced. Follow the Tone-Clock replacement steps listed in the TDM-CLK (TDM Bus Clock) Maintenance documentation.

  If SLIP errors remain follow SLIP ANALYSIS.

5. **Standard system:**—Error 2305:
   - Replace the Expansion Interface circuit pack in this port network and the Expansion Interface circuit pack in the PPN that is connected to this port network.
   - If the problem persists, replace the Tone-Clock circuit pack in the slave port network. Follow the steps listed in the TDM-CLK (TDM Bus Clock) Maintenance documentation to replace the Tone-Clock circuit pack.
   - If the problem still persists, escalate the problem.

j. Noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a synchronization problem occurs causing error types 1, 257, or 513, a WARNING alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MAJOR or MINOR alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Test Synchronization Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Test Synchronization Test (#417)	X	X	ND

1 D = Destructive; ND = Nondestructive

Test Synchronization Test (#417)

This test updates all the Synchronization Maintenance component circuit packs with the correct information regarding their role in providing synchronization for the system. All the Tone-Clock, Expansion Interface, and DS1 Interface circuit packs in the system are updated via this test. This test will either pass or abort.

Table 11-335. TEST #417 Test Synchronization Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	PASS	The Synchronization Maintenance component circuit pack parameters have been successfully updated. The system should be synchronized after successful execution of this test. If synchronization problems still exist, refer to the Error Log to obtain information regarding the source of the problem.

SYS-PRNT (System Printer)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
SYS-PRNT	MINOR	test sp-link l	System Printer
SYS-PRNT	WARNING	release sp-link	System Printer

The Report Scheduler feature provides the capability to schedule selected administration commands to be printed by an asynchronous System Printer (SYS-PRNT) or sent to a Personal Computer (PC). The System Printer Link to this external device can be administered either as a data extension or to the EIA port on the switch Processor (PROCR) circuit pack which provides a standard EIA 232C interface.

System Printer Link Maintenance provides a strategy for maintaining the link between the system and an external SYS-PRNT output device. The strategy includes a set of tests for detection of errors during normal operation, troubleshooting actions, and alarms for serious problems. System Printer Link Maintenance uses a try-and-wait mechanism for maintaining the SYS-PRNT link. If the link set-up fails, a minor alarm is raised for service attention. A warning alarm is raised when the SPE has been busied out. A maximum of two link retry attempts is made. After the second attempt, set-up attempts are only made by the application software (that is, the 15-minute timer fires and jobs are printed unless an immediate job was entered.) After two unsuccessful attempts to establish the link, a MINOR alarm is raised for service attention. If the System Printer Link is torn down due to an error, System Printer Link Maintenance raises a MINOR alarm but does not attempt to bring up the System Printer Link.

In DEFINITY Generic 1, the following physical configurations are supported for the System Printer Link:

a. from the EIA port on the Processor circuit pack to a SYS-PRNT output device via the standard EIA 232C interface
b. from a data channel (DATA-CHL) on the Network Control circuit pack (DATA-BD) to a data extension where the SYS-PRNT output device connects via the standard EIA 232C interface

The data extension can be a(n) PDM, MPDM, DTDM, or ADU. The PDM, MPDM, or DTDM connects to a Digital Line (DIG-LINE) on the TN754 or TN754B Digital Line circuit pack (DIG-BD); the ADU connects to a Data Line (DAT-LINE) of the TN726 Data Line circuit pack (DT-LN-BD).

System Printer Link Maintenance does not cover the elements comprising the SYS-PRNT physical link; that is, the external SYS-PRNT output device, the EIA port on the Processor circuit pack, the Data Module (PDM/MPDM/DTDM) and the Digital Line of TN754 or TN754B Digital Line circuit pack, the ADU and the Data

Line of TN726 Data Line circuit pack, and the data channels on the TN777 Network Control circuit pack. If System Printer Link Maintenance cannot restore the System Printer Link, the maintenance tests of these individual components of the System Printer Link must be executed to diagnose faults.

Procedures for Restoring the System Printer Link

The following procedures should be followed to restore the System Printer Link:

1. Determine the status of the System Printer Link via the **status sp-link** command. Verify that the System Printer Link is not busied out for maintenance. On the System Printer Link Status Form, this is indicated by a "no" in the "Maintenance Busy?" field. If the System Printer Link has been busied out, issue the **release sp-link** command. If the link is "down," proceed to Step 2.
2. Issue the **display system feature** command to determine the destination of the System Printer Link.

   If the destination is an *extension number*, enter the **status data-module <extension>** command and verify that the data extension is in-service/idle. If the data extension is NOT available, refer to the "Port/Channel Number" field on the "Data-Module Status" Form. Look for errors and/or alarms on the circuit pack with which this extension is associated. Refer to the appropriate MO documentation for recommended repair strategy. Continue with Step 3.

   If the destination is *eia*, look for PR-MAINT errors in the Hardware Error Log. If errors are present, refer to Maintenance/Tape Processor Maintenance documentation, and continue with Step 5.
3. Determine if a data channel on the Network Control circuit pack is in-service/idle as follows:
   a. Use the **list data-module** command to find out the extension numbers of the data channels on the Network Control circuit pack. (There is a maximum of 4. They are listed as "netcon" on the Active SPE. Ignore the Standby data channels.)
   b. Enter the **status data-module <extension>** command to verify that at least one Active data channel is in-service/idle.
4. If four data channels are administered and none are available, then look for DATA-CHL/DATA-CON/DATA-BD errors in the Hardware Error Log. If errors are present, refer to these MO sections for recommended maintenance strategy. When problems (if any) with DATA-CHL/DATA-CON/DATA-BD have been resolved, continue with Step 5.

   If fewer than four data channels are administered, then use the **add data-module** command to add a network control data module to the system.
5. Verify the availability of the external SYS-PRNT output device as follows:

Make sure that the SYS-PRNT output device is *on-line* and ready-for-service. Check the physical connectivity between the Data Module and the SYS-PRNT output device or between the EIA port on the backplane of the switch and the SYS-PRNT output device.

6. Verify that there are less than three active logins to the system. If this condition exists, a login session must be terminated before the System Printer Link can be established.
7. If the System Printer Link still cannot be restored, escalate the problem.

NOTE:
It is recommended that the System Printer Link be busied out before executing maintenance tests over objects which compose the System Printer Link. If the System Printer Link is busied out, then all System Printer Link maintenance actions are deactivated.

Hardware Error Log Entries and Test to Clear Values

SYS-PRNT Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test sp-link
18 (a)	0	busyout sp-link	WARNING	OFF	release sp-link
257 (b)	1 to 6	Link Retry Test (#215)	MINOR/ WARNING[2]	OFF	test sp-link l
513 (c)	0	None	MINOR	OFF	test sp-link

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. System Technician has busied out the System Printer Link.

b. A failure was encountered while attempting to set up the System Printer Link. This attempt could have been initiated by either the Report Scheduler software or link maintenance [automatic link retry or the as the result of a Link Retry Test (#215) request]. The Aux Data field contains the following diagnostic information to aid in the correction of the failure:

   1. unavailability of system resources (too many active logins to the system).
   2. no data channels (DATA-CHLs) available on the Network Control circuit pack (DATA-BD).
   3. 4- time-out during setup attempt. Most likely due to problem with physical link or printer status.
   4. internal system error. Most likely temporary/sporadic failure.
   5. the data module the printer is trying to use is busy with another call. Use the **Status data module** command to determine when the port is available for testing.

   Refer to the "Procedures for Restoring the System Printer Link" section for recommended maintenance strategy.

c. The SYS-PRNT was interrupted because of one of the following reasons:

   1. the cable to the SYS-PRNT output device is disconnected;
   2. the SYS-PRNT output device is powered off;

3. the data extension to which the SYS-PRNT output device connects has been busied out;
4. internal software error.

Check the connectivity of the wires and cables among the wall jacket, data module, and SYS-PRNT output device. Follow the instructions provided in the "Procedures for Restoring the System Printer Link" section.

System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system and deciding which ones to address, always investigate errors in the order they are presented in the table below. By clearing error codes associated with the *Link Retry Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down Test (#213)		X	D
Link Retry Test (#215)	X	X	ND
Link Tear Down Test (#213)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is destructive.

The Link Tear Down Test disconnects the existing link between DEFINITY Generic 1 and the external SYS-PRNT output device. If the link has been disconnected already, this test just returns PASS. All resources allocated for a System Printer Link are released after this test.

Table 11-336. TEST #213 Link Tear Down Test

Error Code	Test Result	Description/ Recommendation
40, 50	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of two times. 2. If the test continues to abort, escalate the problem.
1010	ABORT	The System Printer Link has been busied out. 1. Enter the **release sp-link** command to release the System Printer Link from the busyout state. 2. Reissue the **test sp-link long** command to execute the test.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of two times. 2. If the test continues to abort, escalate the problem.
	PASS	The System Printer Link is torn down or a Short Test Sequence was executed and the link was not torn down.

Link Retry Test (#215)

The Link Retry Test sends a message to the SYS-PRNT software process either (1) to make a data call to the extension to which the SYS-PRNT output device connects OR (2) to open the EIA port to the SYS-PRNT output device. If the System Printer Link is already up, this test passes without making a data call or opening the EIA port.

Table 11-337. TEST #215 Link Retry Test

Error Code	Test Result	Description/ Recommendation
10, 20	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of two times. 2. If the test continues to abort, escalate the problem.
30	ABORT	Internal System Error. 1. Refer to the "Procedures for Restoring the System Printer Link" section for recommended maintenance strategy.
1010	ABORT	The System Printer Link has been busied out. 1. Enter the **release sp-link** command to release the System Printer Link from the busyout state. 2. Reissue the **test sp-link long** command to execute the test.
	FAIL	The System Printer Link CANNOT be established. 1. Refer to the "Procedures for Restoring the System Printer Link" section for recommended maintenance strategy.
	PASS	The System Printer Link is up.

SYSTEM (System)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
SYSTEM	None	None	SYSTEM

1 SYSTEM only has errors associated with it and thus only appears in the Error Log and not in the Alarm Log. There are no tests that can be run with SYSTEM.

SYSTEM is generally used for two purposes:

1. When software encounters a problem with either hardware or itself and requests a restart to clear the problem, an error is logged under SYSTEM. For example, if there is a loss of clock in a Generic 1 system with High or Critical Reliability, the system asks for a Reset 2 to switch to the other clock.
2. To log errors that cannot be associated with any single process.

   These errors are more for use by software developers in debugging restarts than in pointing to current problems.

   This should not be considered a problem with the system. The initcauses log should also confirm that a software-requested restart was performed.

Hardware Error Log Entries and Test to Clear Values

The Aux Data field may be 0 or the return code from a bad software call, and the following examples in no way exhaust the possibilities. Often, two errors are logged at the same time for each problem.

System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	None
8 (a)	0	None			
9 (b)	Any	None			
10 (c)	Any	None			
21 (d)		None			
355 (e)	Any	None			
356 (f)	Any	None			
601 (g)		None			
602 (h)		None			
603 (i)		None			
9012 (j)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. A System Restart Level 3 was requested.

b. A System Restart Level 2 was requested. This can happen due to a loss of tones (due to a faulty Tone-Clock circuit pack).

c. A System Restart Level 1 was requested.

d. A process trapped.

e. A Restart Level 2 occurred due to a power loss.

f. A Restart Level 2 occurred due to a tone clock loss.

g. An error occurred during initialization.

h. An error occurred while loading translations and the system requested a Restart Level 3.

i. A process was reset.

j. In a Generic 1 system configured with High or Critical Reliability, a scheduled SPE-interchange was blocked because a tape operation was in progress.

TAPE (Tape Unit) [G3iV1.1-286]

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TAPE	MAJOR	test tape long[1]	Tape Unit
TAPE	MINOR	test tape long	Tape Unit
TAPE	WARNING	test tape long	Tape Unit

1 This alarm occurs only at power-up time or on a Reset System 3, 4, or 5 when the system cannot load **all** translations from tape. Refer to the footnote associated with Error Type 3329 in the "Hardware Error Log Entries and "Test to Clear Values" section.

NOTE:
Alarms on the TAPE, PROCR, and PR-MAINT MOs are indicated by the red LED on the Processor circuit pack.

The Tape Unit consists of a Wangtek FAD3500 series tape drive mounted on the TN774 Tape Drive circuit pack, which is controlled by the TN773 Processor circuit pack. For tape controller functions, the processor uses memory on the TN770 Memory circuit pack.

The Tape Unit is used to:

- Boot the system
- Save or load translations and announcements
- Save the Error Logs
- Save core dumps

There are two versions of the **test tape** system technician command that can be used to initiate maintenance tests on the Tape Unit: one for Standard systems and one for High and Critical Reliability systems. In a Standard system, the command line entry to test the TAPE (Tape) MO is **test tape [short/long] [repeat n/clear]**. In a High or Critical Reliability Option system, the command line entry to test the TAPE (Tape) MO is **test tape [short/long] [a/b] [repeat n/clear]**.

In a High or Critical Reliability system, if an alarm is raised against the Tape Unit, the alarm also indicates the carrier (either 1A or 1B), depending on which SPE has the problem.

NOTE:
CLEANING THE TAPE DRIVE HEAD IS VERY IMPORTANT because a tape drive head with abrasive particles can permanently damage a new tape. In

addition, a worn tape may leave abrasive particles in the tape drive head. Before implementing any of the following repair procedures, the tape head of all the tape drive units in the system should be cleaned. Follow the directions given in the "Tape Drive Head Cleaning Procedure" section.

Hardware Error Log Entries and Test to Clear Values

Tape Unit Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0 (a)	0	Any	Any	Any	test tape
1 (b)	Any	Tape Status Test (#69)	MINOR	OFF	test tape r 2
257 (c)	Any	Tape Status Test (#69)	WARNING	OFF	test tape r 2
513	Any	Tape Reset Test (#67)	MINOR	OFF	test tape l r 2
1025	Any	Tape Diagnostic Test (#66)	MINOR	OFF	test tape r 2
1281	Any	Tape Diagnostic Test (#66)	MINOR	OFF	test tape r 3
1537	Any	Tape Diagnostic Test (#66)	MINOR	OFF	test tape r 3
1793 (d)	Any	None	MINOR	OFF	see (d)
1828 (e)	Any	None	MINOR	OFF	see (e)
2049 (f)	Any	None	WARNING	OFF	see (f)
2051 (o)	Any	Tape Read/Write Test (#65)	WARNING	OFF	see (o)
2084 (g)	Any	None	WARNING	OFF	see (g)
2561	Any	Tape DMA Latch Test (#230)	MINOR	ON	test tape r 3
2817 (h)	Any	Tape Read/Write Test (#65)	MINOR	OFF	test tape l r 2
3329 (i)	Any	Save the Translations	MINOR	OFF	see (i)
3841 (j)	Any	Save the Translations	MINOR	OFF	save translation
3842 (k)	Any	Save the Translations	MINOR	OFF	save translation
3843 (l)	Any	Save the Translations	MINOR	OFF	save translation

Tape Unit Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3984(m)	Any	Save Translations	MINOR	OFF	save translation
10498 (n)	0	Save the Translations			
10508 (o)	0	Save the Translations			

Notes:

a. Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

b. Error 1 indicates that the tape unit does not recognize that a cartridge is inserted into the tape drive. If, in fact, there is no cartridge in the drive, the problem can be corrected by simply inserting a cartridge. Follow the directions given in "Error Type #1 - Repair Procedure."

   If there is a tape cartridge inserted into the tape drive, the problem is that certain tape or tape drive failures may cause the tape drive to erroneously report "missing tape" errors (tape Error Type #1 OR Aux Data value 9024). Since this error may be the result of a problem with either the tape or the tape drive unit, the tape cartridge should be replaced first. If the problem persists, the tape unit should be replaced. When this error is first detected, follow "Error Type #1 - Repair Procedure."

   Error Type #1 - Repair Procedure:

   1. Replace the tape cartridge (if one exists) in the tape unit associated with this error with a new tape cartridge.
   2. Issue the **test tape [a/b] repeat 2** command for the tape drive unit that has the error.
   3. If all the tests pass, assume that the problem has been resolved.

      If some of the tests fail, resolve the corresponding errors, and repeat step #2.
   4. If translations have not already been saved onto the new tape, issue the **save translations** command.
   5. If the system contains recorded announcements, issue the **save announcements** command.

   If Error Type #1 reappears and becomes a chronic problem, the fault may be with the tape drive unit, and it could be intermittent in nature. In this case, replace the tape drive unit with a new tape drive unit and repeat "Error 1 - Repair Procedure." Refer to Step 5 of the "Tape Maintenance and Repair Procedures" section for directions on how to replace the tape drive unit.

c. Error Type #257 indicates that the tape cartridge is write-protected. To disable the tape write-protect feature, move the sliding write-protect switch (which is labeled RECORD) on the tape cartridge away from the RECORD position. The RECORD position is indicated by an arrow pointing to the left. Error Type #257 can then be cleared by issuing the **test tape [a/b] repeat 2** command for the tape drive unit that has the error.

d. Error Type #1793 is reported whenever the system software detects an uncorrectable tape block error during a read or write operation on the tape.

   An **uncorrectable tape error** is one in which a block error persists during a read or write operation to the tape. Errors of this type were unable to be corrected by several attempts at rereading or rewriting the block on the tape. This type of error is most likely the result of one or more hard errors on the tape (for example, a scratch or a hole in the tape that spans multiple sectors).

   The auxiliary data field indicates the file on the tape in which the error was detected. Refer to Table C for a list of possible auxiliary data field values and the corresponding tape file.

   Since this error may be the result of a problem with either the tape or the tape drive unit, the tape cartridge should be changed first. If the problem persists, the tape unit should be changed. When this error is first detected, follow "Error Type #1793 - Repair Procedure."

   Error Type #1793 - Repair Procedure:

   1. Replace the tape cartridge in the tape unit on which the error occurred with a new tape cartridge.
   2. [G1.2, G3iV1.1-286] Issue the **test tape [a/b] long clear** command for the associated tape drive unit.

      [G1.1] Issue the **test tape [a/b] long repeat 3** command for the associated tape drive unit. If the system release is earlier than G1.1, refer to Note (o) also.
   3. If all tests pass, assume that the problem has been resolved.

      If some tests fail, resolve those errors and repeat Step #2.
   4. If translations have not already been saved onto the new tape, issue the **save translations** command.
   5. If the system contains recorded announcements, issue the **save announcements** command.

   If this error reappears and becomes a chronic problem, the fault may be with the tape drive unit, and it could be intermittent in nature. In this case, replace the tape drive unit with a new tape drive unit and repeat "Error Type #1793 - Repair Procedure." Refer to Step 5 of the "Tape Maintenance and Repair Procedures" section for directions on how to replace the tape drive unit.

e. Error Type #1828 is reported under the following conditions;

- [G3iV1, EDI 7.0 and earlier] This error is never reported.
- [G3iV1, EDI 6.0 and earlier] Whenever Test #692 (Tape Block Error Test) fails due to an uncorrectable tape block error.
- [G1.1] Whenever any maintenance test fails due to an uncorrectable tape block error.

To clear Error Type #1828, follow the procedures given in the footnotes for Error Type #1793.

f. Error Type #2049 is reported under the following conditions;

- [G3iV1 EDI 7.0 and later] This error is never reported.
- [G1.1, G3iV1 EDI 6.0 and earlier] Error Type #2049 is reported whenever the software detects a correctable tape block error during a read or write operation on the tape.

  A **correctable tape error** is one in which a block error is detected but corrected during a read or write to the tape. This type of error may be caused by either a soft tape error (for example, the tape head is jiggled while reading or writing data), or by a hard tape error (for example, a scratch or a hole in the tape that affects only a single sector of the tape).

  The auxiliary data field indicates the file on the tape in which the error was detected. Refer to Table C for a list of possible auxiliary data field values and the corresponding tape file.

  With this error, the tape is fully functional but is in danger of developing an uncorrectable tape error. The tape cartridge should be changed when it is convenient to do so.

  To clear Error Type #2049, follow the procedures given in the footnotes for Error Type #1793.

g. Error Type #2084 is reported under the following conditions;

- [G3iV1 EDI 7.0 and later] This error is never reported.
- [G3iV1 EDI 6.0 and earlier] Whenever Test #692 (Tape Block Error Test) fails due to a correctable tape block error.
- [G1.1] Whenever any maintenance test fails due to an correctable tape block error.

To clear Error Type #2084, follow the procedures given in the footnotes for Error Type #1793.

h. [G1.1, G3iV1 EDI 6.0 and earlier] Error Type #2817 is reported whenever the tape read/write test fails. The auxiliary data field indicates the cause of the test failure as follows:

9032 –	Significant portion of the scratch area on the tape cannot be read.
9033 –	Significant portion of the scratch area on tape cannot be written.
9034 –	Significant portion of the scratch area on the tape cannot be read or written.

i. Error Type #3329 indicates that an error occurred while loading translations. This error and the corresponding alarm occurs at power-up or on a Reset System 3, 4, or 5 if the system cannot load translations. This error results in a MAJOR alarm if translations are not already loaded and in a MINOR alarm otherwise. If the system does not contain valid translations, this alarm will invoke Emergency Transfer.

Standard System

NOTE:
The following repair procedure assumes that no major alarms exist on the PROCR (Processor) or MEM-BD (Memory) circuit packs. If any of these alarms exists, resolve them before trying to resolve this alarm.

Error Type #3329—Repair Procedure (Standard System):

1. Look in the Hardware Error Log for Error Type #1793. If this error exists, replace the tape cartridge with a backup cartridge that has valid system translations.
2. [G1.2, G3iV1.1-286] Issue the **test tape long clear** command.
3. [G1.1] Issue the **test tape long repeat 3** command.
4. If all tests except for Test #505 pass, assume that the problem has been resolved. Test #505 will fail if a successful load translations has not occurred.

   If some other tests besides Test #505 fail, resolve those errors, and repeat Step #2.
5. Issue the **reset system 3** command.
6. Issue the **list configuration software** command.
7. If the tape resident translations date is "none," insert a backup tape cartridge and go back to Step #2 (try up to 2 backup tapes).
8. If the problem is *not* resolved, follow normal escalation procedures.

High and Critical Reliability Systems

NOTE:
In a High or Critical Reliability system, the following repair procedure assumes that no major alarms exist on the PROCR (Processor), MEM-BD (Memory), or DUPINT (Duplication Interface) circuit packs or on the STBY-SPE (Standby SPE) MO. If any of these alarms exists, resolve them before trying to resolve this alarm.

Both Active and Standby SPE Tapes alarmed

This situation arises whenever translations cannot be loaded on either SPE. If the system was powered up, both tapes were alarmed at almost the same time as a result of this error. It is very possible that no SPE-Interchange occurred. However, if the system was restarted as a result of a **reset system [3 | 4 | 5]** command, and when an alarm was raised against the Active SPE as a result of Error Type #3329, a Level 3 SPE-Interchange automatically occurred, and the "new" Active SPE attempted to load translations. When this SPE failed to load translations, its tape was alarmed as well.

Error Type #3329 - Repair Procedure #1 (High or Critical Reliability System):

1. Issue the **status system** command to determine which SPE

   (A or B), is the Active SPE. It is labeled as "active."

2. Use "Error Type #3329—Repair Procedure (Standard System)" to ensure that the tape and tape unit in the Active SPE are functioning properly and to read in translations.

3. Log into the Manager I terminal again and issue the **display alarms** command to see if any alarms were raised against the Active SPE tape.

   a. If a major alarm against the Active SPE tape now exists, escalate the problem.

   b. If minor alarms against the Active SPE tape now exist, resolve those alarms before continuing with Step #5.

   c. If no alarm exists against the Active SPE tape, continue with Step #4.

4. Replace the tape in the Standby SPE. If a new tape is used, translations must have been successfully saved in order to clear Error Type #3329.

5. Issue the **refresh spe-standby** command. It may be necessary to issue this command multiple times. However, if you have issued the **refresh spe-standby** command five times, and if the Standby SPE is still not labeled "Standby" on the Status System Form, escalate the problem.

6. The Standby SPE must be in Standby Mode before issuing the **test tape [a|b] long** command. If the Standby SPE is not in Standby Mode, the additional tests needed to clear Error Type #3329 are not run. These additional tests also cause the **test tape [a|b] long** command to take longer to execute.
7. Test the Standby tape by issuing the **test tape [a|b] long** command. Issuing this command whenever the SPE contains an active Error Type #3329 causes the SPE to undergo a COLD 1 restart. This restart attempts to load translations and, if successful, it clears the error.
8. If the problem is not resolved, follow normal escalation procedures.

Only one SPE Tape alarmed

A typical scenario that results in a single minor TAPE alarm follows: The system boots up on an SPE and cannot read in translations. As a result, a major alarm against TAPE is raised. The system performs a Level 3 SPE-interchange and then reads in translations from the tape on the "new" Active SPE. At this point, the major TAPE alarm is downgraded to a minor TAPE alarm.

Error Type #3329 - Repair Procedure #2 (High or Critical Reliability System):

1. The tape against which Error Type #3329 has been logged should reside in the Standby SPE. Issue the **status system** command to determine which SPE is active.

   If Error Type #3329 is logged against the Active SPE, follow Steps 1 through 3 of "Error Type #3329—Repair Procedure #1 (High and Critical Reliability Systems)."

   If Error Type #3329 is logged against the Standby SPE, follow Steps 4 through 7 of "Error Type 3329 - Repair Procedure #1 (High and Critical Reliability Systems)."
2. Error while saving translations. Resolve other tape errors, and reissue the **save translations** command.

j. Error Type #3841 indicates that a save translations operation failed because the tape was in use. Wait two minutes, then issue the **save translations** command. Try this a maximum of five times.

k. Error Type #3842 indicates a save translation failure due to a tape-related problem. The following procedure is recommended to clear this error.

   Error Type 3842 - Repair Procedure:

   1. Look in the Hardware Error Log for Error Type #1793. If this error exists, replace the tape cartridge in the tape unit on which the error occurred with a new cartridge.
   2. [G1.2 and later] Issue the **test tape [a/b] long clear** command for the associated tape drive unit.

[G1.1 and earlier] Issue the **test tape [a/b] long repeat 3** command for the associated tape drive unit.

3. If all tests up to Test #505 pass, assume that the problem has been resolved. Test #505 will fail if a successful save translations has not occurred since the original failure.

   If any tests other than Test #505 fail, resolve those errors and repeat Step #3.

4. Issue the **save translations** command.
5. If the system contains recorded announcements, issue the **save announcements** command.

l. Error Type #3843 indicates that during daily scheduled maintenance, the automatic save translation failed. The failure occurred most likely as a result of a hardware problem rather than a tape problem.

   To clear Error Type #3843, follow the procedures given in the footnotes for Error Type #3842.

m. [G1.1 and earlier] Translations were not saved on the tape(s) corresponding to the port field(s) indicated. In this case, the port field points to the Standby SPE at the time the error occurred. Resolve other tape errors, and then issue the **test tape long** and **save translations** commands, respectively.

n. [G1.1 and earlier] If these errors occur in conjunction with Error Type #3329, a major alarm is logged against the error type. To resolve this alarm, follow the instructions for Error Type #3329.

o. [G1.1 and earlier] "Leaky Bucket" strategy for Error Types #1793, #1828, #2049, #2051, and #2084 on the Active SPE. Whenever any of these errors appear in the Error Log, they will be automatically resolved within 48 hours if the errors do not recur within that period. In G1.0, this is the only way these errors can be cleared (without resetting the system).

System Technician Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Tape DMA Latch Test* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tape Reset Test (#67)		X	ND
Tape DMA Latch Test (#230)	X	X	ND
Tape Diagnostic Test (#66)	X	X	ND
Tape Read/Write Test (#65) (a)		X	ND
Tape Block Error Test (#692) (b)		X	ND
Tape Status Test (#69)	X	X	ND
Tape Translation Status Test (#505)		X	ND
TAPE-DAT Tape Consistency Test (#421) (c)		X	ND

1 D = Destructive; ND = Nondestructive

a. The Tape Read/Write Test only runs in the following software releases;
   - G1
   - G3iV1, EDI 6.0 and earlier.
b. The Tape Block Error Test runs only in software release G3iV1, EDI 15.0 and earlier.
c. Refer to TAPE-DAT (Tape Consistency) Maintenance documentation for the description of this test.

Tape Read/Write Test (#65)

The purpose of this test is to exercise the hardware read/write circuitry and the basic functionality of the tape cartridge. This test is done by reading 22 blocks of data and by then writing 22 blocks of data into reserved space on the tape cartridge.

NOTE:
This test does not check for tape cartridge data consistency, nor does it check the integrity of every block on tape.

Table 11-338. TEST #65 Tape Read/Write Test

Error Code	Test Result	Description/ Recommendation
1029 to 1030 and 2011 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9000's	ABORT or FAIL	Refer to Table A in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
Any Others	ABORT or FAIL	Refer to Table B in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
	PASS	All tape hardware is in good working order. Passing this test does not guarantee that every single data block on the tape cartridge can be read or written to.

Tape Diagnostic Test (#66)

This test activates the diagnostic tests built into the Maintenance/Tape Processor (MTP) firmware on the TN773 Processor circuit pack. The test verifies the basic read/write capability of the tape drive and tape cartridge. Also, the test performs controller/MTP hardware diagnostics.

The test reads from the tape and performs write verification testing by writing data into a maintenance block and reading it back. It also performs a tape drive head step check by advancing the tape drive head through all even streams on the tape (streams 0 through 18) to make sure the head is operational.

The test does not test every data block on the tape.

Table 11-339. TEST #66 Tape Diagnostic Test

Error Code	Test Result	Description/ Recommendation
1029 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9000’s	ABORT or FAIL	Refer to Table A in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
Any Others	ABORT or FAIL	Refer to Table B in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
	PASS	This is a comprehensive test of the Tape Unit. The test verifies that the tape drive is in good working order.

Tape Reset Test (#67)

This test resets the tape portion of the Processor on the Maintenance/Tape Processor (PR-MAINT), and it resets the shared RAM on the Processor circuit pack (TN770). The test can pass when no drive is present because it never accesses the tape drive.

Table 11-340. TEST #67 Tape Reset Test

Error Code	Test Result	Description/ Recommendation
1029 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9000's	FAIL	Refer to Table A in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
Any Others	FAIL	Refer to Table B in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
	PASS	Communication with the tape processor is possible at a very basic level.

Status Request Test (#69)

This test requests the Maintenance/Tape Processor (MTP) firmware on the TN773 Processor circuit pack for the current Tape Unit status and displays the results.

Table 11-341. TEST #69 Status Request Test

Error Code	Test Result	Description/ Recommendation
1029 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9000's	ABORT	Refer to Table A in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
Any Others	FAIL	Refer to Table B in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.
	PASS	This test verifies the basic communication between the Processor and the Tape Drive circuit pack.

Tape DMA Latch Test (#230)

Also known as the *Tape Interface Test*, this test checks the shared RAM on the TN770 Memory circuit pack. The test also checks the communication paths on the TN773 Processor circuit pack.

Table 11-342. TEST #230 DMA Latch Test

Error Code	Test Result	Description/ Recommendation
1029 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
23001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
23002 to 23005	FAIL	Hardware not responding. 1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section.
23006	FAIL	Could not send a test message to MTP. 1. Repeat the same test again. 2. Look for PROCR and MEM-BD errors in the Error Log. If such errors are present, refer to PROCR (80286 Processor circuit pack) and MEM-BD (Memory) Maintenance documentation. 3. If no tests on the Memory circuit pack or Processor circuit pack fail, escalate the problem.

Continued on next page

Table 11-342. TEST #230 DMA Latch Test — *Continued*

Error Code	Test Result	Description/ Recommendation
23007	FAIL	Operation timed out. 1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Issue the **test tape long** command. 3. If the test fails, make sure tape is fully inserted. 4. If the test continues to fail, clean the tape head and retest. 5. If fail, swap tape and retest. 6. If the test still fails, swap tape unit, *use original tape* and retest. 7. If the problem still exists, escalate the problem.
23008	FAIL	MTP indicates a test failure. 1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
23009 to 23017	FAIL	Hardware problem. Problem accessing test Memory locations #1, #2, and #3. 1. Follow the procedures provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
9000's	ABORT	Refer to Table A, "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for the specific error code.
Any Others	ABORT	Refer to Table B, "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for the specific error code.
	PASS	If this test passes, the TN770 Memory and the TN773 Processor circuit packs are in good working order. This is not a test of the tape cartridge or of the TN774 Tape Drive circuit pack.

Tape Translation Status Test (#505)

This test checks whether the TAPE is currently alarmed due to the failure of a load translation or save translation attempt on the TAPE.

Table 11-343. TEST #505 Tape Save Translation Status Test

Error Code	Test Result	Description/ Recommendation
1029 to 1030 and 2011, 2013 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
2012	ABORT	1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Issue the **test tape long** command. If the test passes, issue the **save translations** command to verify condition is clear. 3. If the test fails, make sure tape is fully inserted. 4. If the test continues to fail, clean the tape head and retest. 5. If fail, swap tape and retest. 6. If the test still fails, swap tape unit, *use original tape* and retest. 7. If the problem still exists, escalate the problem.
	FAIL	The tape is currently alarmed because a save translation or a load translation attempt failed on this tape. Look for Errors Types #3329, #3841, #3842, and #3843 in the Hardware Error Log and resolve these errors by following the procedures provided in the "Hardware Error Log Entries and Test to Clear Values" section.
	PASS	The last load translation and (if any) save translation attempts were successful on this tape.

Tape Block Error Test (#692)

This test is performed by rereading the list of tape blocks that have been reported by the software to contain correctable (Error Type #2049) or uncorrectable (Error Type #1793) block errors.

A **correctable tape error** is one in which a block error is detected but corrected during a read or write to the tape. This type of error may be caused by either a soft tape error (for example, the tape head is jiggled while reading or writing data) or by a hard tape error (for example, a scratch or a hole in the tape that affects only a single sector of the tape).

An **uncorrectable tape error** is one in which a block error persists during a read or write operation to the tape. Errors of this type are unable to be corrected by several attempts at rereading or rewriting the block on the tape. This type of error is most likely the result of one or more hard errors on the tape (for example, a scratch or a hole in the tape that spans multiple sectors).

This test passes only if no block errors of any type are detected after the test completes. Otherwise, the test fails and returns an error code of the form "x0y," where:

> **x** indicates the number of uncorrectable block errors detected by the test [0-5]
> **y** indicates the number of correctable block errors detected by the test [0-5]

The software stores the block location for at most five errors of each type.

Table 11-344. TEST #692 Tape Block Error Test

Error Code	Test Result	Description/ Recommendation
1029 to 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9000's	ABORT	Refer to Table A in "Tape Unit Aux Data/Error Codes Tables" and follow the recommended repair strategy for specific Aux Data.

Continued on next page

Table 11-344. TEST #692 Tape Block Error Test — *Continued*

Error Code	Test Result	Description/ Recommendation
x0y	FAIL	"x" indicates the number of uncorrectable block errors detected by the test [0-5]. "y" indicates the number of correctable block errors detected by the test [0-5]. Look for Error Types #1793, #1828, #2049, and #2084 in the Hardware Error Log and resolve these errors by following the procedures provided in the "Hardware Error Log Entries and Test to Clear Values" section. **NOTE:** If the value of "x" is "0," only the value of "y" is displayed.
100	FAIL	1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Issue the **test tape long** command. 3. If the test fails, make sure tape is fully inserted. 4. If the test continues to fail, clean the tape head and retest. 5. If fail, swap tape and retest. 6. If the test still fails, swap tape unit, *use original tape* and retest. 7. If the problem still exists, escalate the problem.
	PASS	No block errors are detected.

Tape Unit Aux Data/Error Codes Tables

Table 11-345. Table A: Tape Unit Aux Data Table

Aux Data/ Error Codes	Explanation	Strategy
9002	Internal system error.	Escalate the problem.
9003	Hardware not responding.	1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
9004 9005	Internal system error.	Escalate the problem.
9009 9010	Operation timed out. Hardware not responding.	1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
9011	Internal system error.	Escalate the problem.
9012	Tape already in use.	1. If the Tape Unit is in use (that is, the yellow LED on the tape drive is on and there is tape cartridge motion), wait until the first request is complete. **If there does not appear to be tape motion and/or the yellow LED on the tape drive is not on, go to next step**. 2. Retry the **test tape** command at one-minute intervals a maximum of five times. **If the command continues to abort, escalate the problem.**

Continued on next page

Table 11-345. Table A: Tape Unit Aux Data Table — *Continued*

Aux Data/ Error Codes	Explanation	Strategy
9013	Tape drive self-test failed.	1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
9015	Test detected hardware failure.	
9017	Could **NOT** reset the tape drive.	
9020	⚠ **WARNING:** *The tape cartridge is starting to wear, but it is still functional.*	
9023	Write-protected tape.	1. Disable the write-protect switch on the tape cartridge. 2. Check the power by performing Step 1 of the "Tape Maintenance and Repair Procedures" section. 3. If the problem still exists, escalate the problem.
9024	No tape cartridge in tape drive.	1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Issue the **test tape long** command. 3. If the test fails, make sure tape is fully inserted. 4. If the test continues to fail, clean the tape head and retest. 5. If fail, swap tape and retest. 6. If the test still fails, swap tape unit, *use original tape* and retest. 7. If the problem still exists, escalate the problem.

Continued on next page

Table 11-345. Table A: Tape Unit Aux Data Table — *Continued*

Aux Data/ Error Codes	Explanation	Strategy
9025	Tape cartridge is worn, and it is **NOT** functional.	1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Clean the tape head. 3. If still fail, check tape insertion, swap tape if necessary, and retest. 4. Replace tape unit as a last resort. 5. If the problem still exists, escalate the problem.
9026	Hardware error detected.	1. Do the steps below following the directions in the "Tape Maintenance and Repair Procedures" section. 2. Issue the **test tape long** commnd.dispatch with tape unit. 3. If the test fails, make sure tape is fully inserted. 4. If the test continues to fail, clean the tape head. *Use original tape* and retest. 5. If the test still fails, swap tape unit, *use original tape* and retest. **NOTE:** It is very important that hardware problems are resolved *before* using backup tape. 6. If fails again, swap tape and restest. 7. If the problem still exists, escalate the problem.
9027	The test failed because the software could not access the tape hardware.	

Continued on next page

Table 11-345. Table A: Tape Unit Aux Data Table — *Continued*

Aux Data/ Error Codes	Explanation	Strategy
9030	Internal system error.	1. Follow the steps provided in the "Tape Maintenance and Repair Procedures" section. 2. If problem still exists then escalate.
9032	Inability to read a significant portion of the scratch area on the tape.	1. Follow the steps provided in the "Tape Maintenance and Repair Procedures" section. 2. If problem still exists then escalate.
9033	Inability to write a significant portion of the scratch area on the tape.	1. Follow the steps provided in the "Tape Maintenance and Repair Procedures" section. 2. If problem still exists then escalate.
9034	Inability to both read and write a significant portion of the scratch area on the tape.	1. Follow the steps provided in the "Tape Maintenance and Repair Procedures" section. 2. If problem still exists then escalate.

How to Use Table B to Determine Aux Data Values

In this table, the numbers can have one to five digits. If the first or leftmost digit is "1," the number has five digits. If the first digit or leftmost digit is "2," the number has four digits. If the first or leftmost digit is "3," the number has three digits. If the first or leftmost digit is "4," the number has two digits. If the first or leftmost digit is "5," the number has one digit. For example, if the number is "2300," "2" indicates that the tape cartridge should be replaced soon. "3" indicates that the Tape Drive could not read or write at least one block of data from the tape.

Table 11-346. Table B. Tape Unit Aux Data Table

Digit	Aux Data/ Error Code (a)	Explanation	Strategy
0	0	Exact cause of error is not determined.	1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the tape alarm still exists, escalate the problem. If this is the only error and there is no alarm, ignore this error.
1	1xxxx	If the aux data is "10000," the error is non-fatal.	Ignore the "10000" case.
		Each of the last four digits of the Aux Data "1xxxx" is a non-zero value.	Follow the steps in the appropriate aux data section.
2	2xxx	The tape cartridge should be replaced soon.	1. Follow the instructions provided in the "Tape Maintenance and Repair Procedures" section. 2. If the problem still exists, escalate the problem.
3	3xx	Cannot read or write at least one block of data from the tape.	
4	4x	A problem was found reading the Shared Memory.	
5	5	Tape drive self-test failed.	

Aux Data Values Indicating the Tape File Type

This table translates Aux Data values to the corresponding tape file type.

Table 11-347. Table C. Tape File Types

Aux Data Value	File Type
0	Primary Translation File
1	Backup Translation File
2	Core Dump File
3	Program Update File
4	Boot Image File
6	Error Log File (not including scratch area)
12	Stored Announcement File
16	Processor Interface Firmware File
17	Header Block
19	Packet Control Firmware File
20	NIPM File
21	X25 File
22	Primary Directory File
23	Backup Directory File

Tape Drive Head Cleaning Procedure

The tape drive head (also called the tape head) should be cleaned at least once a year. **However, as part of the preventive maintenance strategy, it is recommended that you inspect the tape head during each maintenance visit and that you clean the tape head several times a year**. In addition, a dated label should be placed on the tape drive unit after the tape head is cleaned. You should also complete the "AT&T Preventive Maintenance Log" sheet. (Refer to Chapter 5, "Routine Maintenance Procedures".)

New tapes leave more abrasive particles on the tape head. Therefore, if a new tape is used, issue the **test tape long repeat 3** command, and then clean the tape head.

The tape head can be accessed for cleaning from the front of the drive by opening the tape access door with your finger. See Figure 11-100.

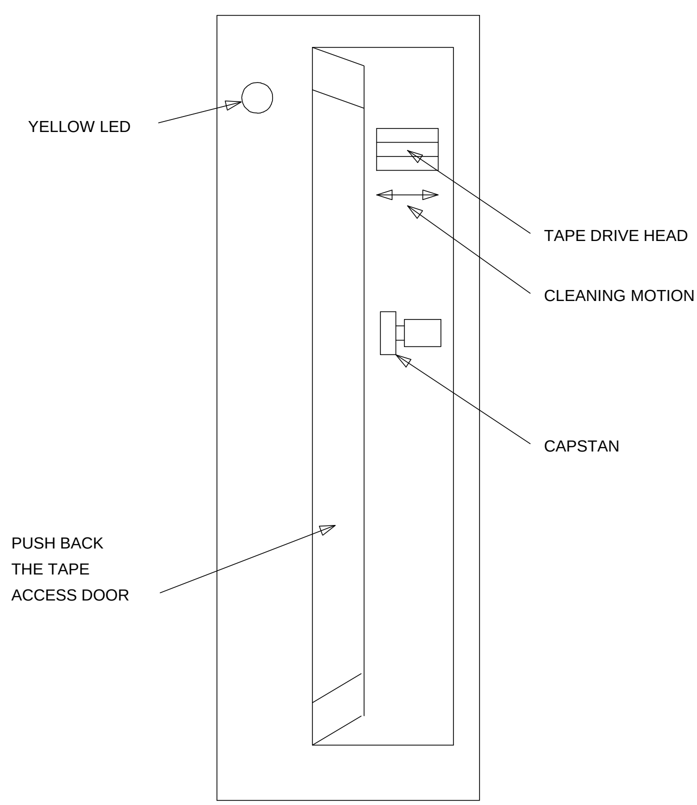

Figure 11-100. Front View of the Tape Drive

To position the tape drive head properly for cleaning, do the following:

1. Install a tape cartridge into the drive with the power on.
2. Wait 10 seconds or until the spinning of the tape stops.
3. Remove the tape cartridge.

CAUTION:
The tape drive head should be cleaned by using only Freon TF and polyurethane swabs. These products are usually available in VCR head cleaning kits sold in video stores.

4. Wet the swab with the Freon TF solution.
5. Using a "side-to-side" motion, wipe the tape drive head.

WARNING:
DO NOT GET TAPE HEAD CLEANING SOLUTION ON THE CAPSTAN.

6. With a dry swab, wipe away any remaining residue from the tape head.

Tape Maintenance and Repair Procedures

This section contains commonly used procedures to resolve tape alarms. The following equipment may be needed to complete these procedures:

- Tape Cartridges (3)
- TN774 Tape Drive Circuit Pack (1)
- TN773 Processor Circuit Pack (1)
- TN770 Memory Circuit Pack (1)

NOTE:
In the following repair procedures, the term "main tape(s)" is used to refer to the tape(s) that were physically present in the tape drive(s) at the time the problem occurred. The "main tape(s)" should not be confused with the term "backup tape(s)" Backup tapes are physically stored outside of the tape drive(s). The term "new tape(s)" refers to the three new tapes that you should bring with you to the customer's site; these tapes may be needed to complete the tape maintenance procedures. The new tapes should not have been used previously in the customer's system. **It is very important to keep track of these tapes.**

1. Check the Error Log for power-related problems and refer to the POWER, DC-POWER, and CARR-POW Maintenance documentation sections. If no power errors exist, check the tape drive for power as follows:

- If there is a problem with the 12V supplied to the tape drive, its yellow LED will be in a blinking mode. The 12V is supplied by the 631DB or 676B power unit in a multicarrier cabinet system and by a WP91153 in the single-carrier cabinet system. This problem can also be caused by a failure in the 984D DC power converter on TN774 Tape Drive circuit pack.
- If there is a problem with the five volts supplied to the tape drive, there is no visible way to determine this except by using the TN2036 Voltage Range circuit pack (see the "Troubleshooting Backplane Voltage Problems" section in Chapter 5, "Routine Maintenance Procedures" or by using the following procedure:

  Insert a tape cartridge into the tape drive. There should be a spinning noise indicating that the tape drive is doing a short retension pass. If there is no noise, the power may be disconnected.

2. Check for a dirty tape drive head.
   - Clean the tape drive head (refer to the "Tape Drive Head Cleaning Procedure" section, which immediately precedes this section).
   - Reinsert the main tape cartridge (for example, the tape that was in the tape drive). Make sure the tape is not write-protected.
   - Issue the **test tape long repeat 3** or, for a High or Critical Reliability system, the **test tape [a|b] long repeat 3** command.

   If all tests pass:

   The alarm should be cleared ([G1 Only] unless Error Type #1793, #1828, #2049, or #2084 is present, in which case 48 hours must elapse). The problem was a dirty tape drive head.

   If any of the tests failed, proceed to Step 3.

3. Check the health of the main tape cartridge.
   - Clean the tape drive head again since the main tape may have left abrasive particles on the tape drive head during the execution of the **test tape** commands.
   - Insert the backup tape cartridge. **Make sure it is not write-protected.**
   - Issue the **test tape long repeat 3** command or, for a High or Critical Reliability system, the **test tape [a|b] long repeat 3** command.

   If all tests pass:

   The alarm should be cleared ([G1 Only] unless Error Type #1793, #1828, #2049, or #2084 is present, in which case 48 hours must elapse). The problem was a defective main tape. Mark the defective tape and follow the standard disposal procedures.

   If any of the tests failed, proceed to Step 4.

4. Check for the health of the backup tape.

   - Clean the tape drive head again since the backup tape may have left abrasive particles on the tape drive head during the execution of the **test tape** commands.
   - Insert a new tape cartridge.

     CAUTION:
     Make sure that the tape is not write-protected and that the new tape contains the same or newer vintage of software compared to the vintage currently in the system.

   - Issue the **test tape long repeat 3** command or, for a High or Critical Reliability system, the **test tape [a|b] long repeat 3** command.

   If all tests pass:

   The alarm should be cleared ([G1 Only] unless Error Type #1793, #1828, #2049, or #2084 is present, in which case 48 hours must elapse). The problem was that both the main tape and backup tape became defective. Mark the defective tape and follow the standard disposal procedures.

   Use the following procedure to save translations and announcements on the new tape:

   - On a High or Critical Reliability system, issue the **refresh spe-standby** command. It may be necessary to issue this command multiple times. However, if you have issued the **refresh spe-standby** command five times and the Standby SPE is still not labeled "Standby" on the Status System Form, escalate the problem.
   - Issue the **save translations** command. If there is a TN750 Announcement circuit pack in the system, issue the **save announcements** command. Saving announcements may take longer than 30 minutes to complete.
   - If this is a High or Critical Reliability system, run the Tape Consistency Test (#421) by issuing the **test tape [a|b] long** command. Refer to the TAPE-DAT Maintenance documentation to resolve any errors.
   - Clean the tape head since new tapes leave more abrasive particles on the tape head (refer to the "Tape Drive Head Cleaning Procedure" section).

     If any of the tests fail, proceed to Step 5.

5. Check the health of the tape drive.

   WARNING:
   Vintage 6 and Vintage 8 of the TN773 Processor circuit pack in a Medium Cabinet use 12V DC power supplied from the Tape Drive

circuit pack and thus may cause severe service disruption when the Tape Drive circuit pack is unseated from its slot. Therefore, when repairing a High or Critical Reliability system with this configuration, make the carrier with tape errors/alarms the Standby carrier before proceeding. For a Standard system with this configuration, arrange to do the work in off-hours before proceeding.

- Replace the tape drive. **DO NOT TURN OFF THE POWER**.
- Clean the tape drive head of the new tape drive.
- Insert the main tape cartridge.
- Issue the **test tape long repeat 3** command, or, for a High or Critical Reliability system, the **test tape [a|b] long repeat 3** command.

  If all tests pass:

  The alarm should be cleared ([G1 Only] unless Error Type #1793, #1828, #2049, or #2084 is present, in which case 48 hours must elapse). The problem was that the original tape drive was defective. (To see the hardware errors against the TAPE MO, issue the **display errors** command. Enter "a" in the Interval field and "tape" in the Category field.)

  If any of the tests fail, proceed to Step 6.

6. Determine if the defective tape drive has damaged the tapes.

   - Clean the tape drive head again since the main tape may have left abrasive particles on the tape drive head during the execution of the **test tape** commands.
   - Insert a new tape (not the one used in Step 4).

     CAUTION:

     Make sure that the tape is not write-protected and that the new tape contains the same or newer vintage of software compared to the vintage currently in the system.

   - Issue the **test tape long repeat 3** command, or for a High or Critical Reliability system, the **test tape [a|b] long repeat 3** command.

If all tests pass:

The alarm should be cleared ([G1 Only] unless Error Type #1793, #1828, #2049, or #2084 is present, in which case 48 hours must elapse). The problem was that the original drive is defective and that it damages any tape you put in it. (To see the hardware errors against the TAPE MO, issue the **display errors** command. Enter "a" in the Interval field and "tape" in the Category field.)

If the alarm persists, the cause of the problem is either the Maintenance/Tape Processor (MTP) residing on the TN773 Processor circuit pack or the Shared Memory (SRAM) on the TN770 Memory circuit pack. **Replacement of either of these two circuit packs in a Standard system requires powering down of the control carrier.** Therefore, use the following procedures to determine that there is a good (bootable) tape with the customer's translations (since the main and backup tapes may have been corrupted and, as a result, would then prevent the successful reading in of translations during power-up).

NOTE:
Follow Steps 7 through 10 for Standard systems and Steps 11 through 13 for High or Critical Reliability systems.

For Standard Systems

NOTE:
Before performing the following repair procedures, refer to the "Handling Control Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures" for instructions on how to replace a circuit pack in a Standard system.

7. **Make sure that there is a good tape drive and a good tape with the customer's translations before powering down the system.**
   - Insert a new tape cartridge. **Recall that a "new tape" is a tape that has not been used previously in the customer's system**.

     CAUTION:
     Make sure that the tape is not write-protected and that the new tape contains the same or newer vintage of software compared to the vintage currently in the system.

   - Try to make a tape with the customer's translations by issuing the **save translations** command. If successful, proceed to Step 8. If the translations were not saved successfully, request that the TSC remotely make a copy of the customer's tape by saving the translations and announcements. When you receive this tape from the TSC, continue with Step 8.
8. With the tape that has the customer's translations set aside, replace the TN770 Memory circuit pack.

   CAUTION:
   Make sure that you are using the customer's existing tape drive and tape and not the tape made in Step 7.

   - Power down the system.
   - Replace the TN770 Memory circuit pack.

- Power up the system.
- If the existing tape cannot bring up the system with the customer's translations, replace the tape drive and tape with a new tape drive and the tape made in Step 7. Reboot the system again.
- If the tape made in Step 7 cannot bring up the system with the customer's translations, proceed to Step 9.
- If the system comes up with the customer's translations, enter the **test tape long repeat 3** command.

If all tests pass:

The problem was a defective Memory circuit pack. If the tape was replaced, the Memory circuit pack and the tape may be defective.

If any test failed, proceed to Step 9.

9. Replace the TN773 Processor circuit pack.
   - Power down the system.
   - Reinsert the original TN770 Memory circuit pack.
   - Replace the TN773 Processor circuit pack.
   - Power up the system.
   - If the system boots up with the customer's translations, enter the **test tape long repeat 3** command.

   If all tests pass:

   The problem was a defective TN773 Processor circuit pack. The TN770 Memory circuit pack is working fine.

   If any test failed or if the system cannot be brought back into service successfully, proceed to Step 10.

10. Replace the TN770 Memory circuit pack. Use both the new Memory circuit pack and the new Processor circuit pack.
    - Power down the system.
    - Replace the TN770 Memory circuit pack.
    - Power up the system.
    - If the system comes up with the customer's translations, issue the **test tape long repeat 3** command.

    If all tests pass:

    The problem was a defective Memory circuit pack and a defective Processor circuit pack.

    If any test still fails, escalate the problem.

For High or Critical Reliability Systems

NOTE:
Before performing the following repair procedures, refer to the "Circuit Pack Replacement Procedure" section in Chapter 8, "Reliability Systems: A Maintenance Aid" for instructions on how to replace a circuit pack in a High or Critical Reliability System.

Make sure that the SPE that has the alarmed tape/tape drive is the Standby SPE before replacing the Processor circuit pack or the Memory circuit pack.

11. Replace the TN770 Memory circuit pack on the STANDBY control carrier.
    - Replace the TN770 Memory circuit pack (see the previous Note).
    - Test the tape in the Standby control carrier by issuing the **test tape [a|b] long repeat 3** command, where "[a|b]" is the Standby control carrier.

    If all tests pass:

    The problem was a defective Memory circuit pack.

    If any test failed, proceed to Step 12.

12. Replace the TN773 Processor circuit pack on the STANDBY control carrier.
    - Reinsert the original TN770 Memory circuit pack.
    - Replace the TN773 Processor circuit pack (see the previous Note).
    - Test the tape in the Standby Control Carrier by issuing the **test tape [a|b] long repeat 3** command, where "[a|b]" is the Standby control carrier.

    If all tests pass:

    The problem was with the TN773 Processor circuit pack.

    If any test failed, proceed to Step 13.

13. Replace the TN770 Memory circuit pack on the STANDBY control carrier. Use both the new Memory circuit pack and the new Processor circuit pack.
    - Replace the Memory circuit pack (see the previous Note).
    - Test the tape in the Standby Control Carrier by issuing the **test tape [a|b] long repeat 3** command, where "[a|b]" is the Standby control carrier.

    If all tests pass:

    The problem was a defective Memory circuit pack and a defective Processor circuit pack.

    If any test still fails, the problem could be with other control carrier circuit packs. Replace each circuit pack, one at a time, until all the tape tests pass. If the problem persists, escalate the problem.

TAPE-DAT (Tape Consistency)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TAPE-DAT	MINOR	test tape a|b l	Tape Consistency

In High and Critical Reliability systems, the system software translations, as well as other information, can be stored on two tapes: one in the Active SPE and one in the Standby SPE. In order to flag a problem when these tapes become mismatched, Tape Consistency monitors the translations, announcements, update files, and software vintage number on both tapes in a High or Critical Reliability PPN system. If the translation time stamp, announcement time stamp, and update file time stamp and identifiers on the two tapes are not the same and/or if the software vintage numbers do not match, an alarm is raised. The software vintage can be displayed via the **list configuration software-vintage** command. The Tape Consistency Test is run on system technician command and once a week as part of daily Standby SPE maintenance. Tape Consistency does not apply and does not exist in Standard systems.

Hardware Error Log Entries and Test to Clear Values

Tape Consistency Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tape a/b l
8 or 16	8 or 16	Tape Consistency Test (#421)	WARNING	OFF	test tape a/b l
1-7, 9-15, 17-86	8 or 16	Tape Consistency Test (#421)	MINOR	OFF	test tape a/b l

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

a. An "8" in the log refers to carrier A and a "16" refers to carrier B. The Aux Data field records which SPE was active at the time the Tape Consistency Test failed.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Tape Diagnostic Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tape Reset Test (#67) (a)		X	ND
Tape DMA Latch Test (#230) (a)	X	X	ND
Tape Diagnostic Test (#66) (a)	X	X	ND
Tape Read/Write Test (#65) (a) (b)		X	ND
Tape Block Error Test (#692) (a) (b)		X	ND
Tape Status Test (#69) (a)	X	X	ND
Tape Translation Status Test (#505) (a)		X	ND
TAPE-DAT Tape Consistency Test (#421) (c)		X	ND

1 D = Destructive; ND = Nondestructive

a. See TAPE (Tape Unit) Maintenance documentation for this test description.

b. This test does not run in release G3iV1 EDI 7.0 or later.

c. The Tape Consistency Test does not run in a Standard system.

Tape Data Consistency Check Test (#421)

The software vintage number, translation time stamps, announcement time stamps, and update file time stamps and identifiers are read off both tapes and compared. If the comparison shows any discrepancy, TAPE-DAT is alarmed. This test is run in a High or Critical Reliability Option system. The test is run as part of the **test tape long** and as part of weekly TAPE maintenance.

Table 11-348. TEST #421 Tape Data Consistency Check Test

Error Code	Test Result	Description/ Recommendation
0	ABORT	The test timed out without completing. This error can occur when the system is heavily loaded and the test is not allocated sufficient time to run. 1. Rerun the test when the system is less busy and is not running standby maintenance. 2. If the test continues to abort, escalate the problem.
1029 1030 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2051	ABORT	Refer to the STBY-SPE (Standby SPE) Maintenance documentation for a description of these error codes.
9005	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
35498	ABORT	Difficulty was encountered trying to send information between the SPEs.
35512	ABORT	The Standby SPE cannot be put into maintenance mode. 1. Check for and resolve all DUPINT (Duplication Interface Circuit Pack), SHDW-LNK (Memory Shadowing Link), SHDW-CIR (Common Shadow Circuit), and STBY-SPE (Standby SPE) alarms. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
35514	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
35534	ABORT	Could not allocate the tape drive (could be active or standby) because another tape operation was in progress. 1. Wait 10 minutes, and retry the command.
35535	ABORT	Could not access the tape (could be active or standby). 1. The tape may be damaged or missing. Resolve all problems with all tape tests in the Long Test Sequence for both tapes. 2. Repeat the test.
1	FAIL	The standby translations are out-of-date. The translations on the Standby SPE (tape) are older than those on the Active SPE (tape).
2	FAIL	The Active SPE translations are out-of-date. 1. Issue the **save translations** command. If the translation save passes on both SPEs, proceed to Step 2. 2. Run **test tape long** again to resolve the alarms.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
3	FAIL	The load vintages are different in both SPEs.
4	FAIL	The load vintages are different in both SPEs.
5	FAIL	The load vintages and translations are different in both SPEs. The Active SPE has the most current translations.
6	FAIL	The load vintages and translations are different in both SPEs. The Standby SPE has the most current translations. 1. Determine which tape contains the desired software release by issuing a **list configuration software long** command. Obtain another tape of the same software release. Install both tapes, and issue the **save translations** command. If there is a TN750 Announcement circuit pack in the system, issue the **save announcements** command. If the translation (and announcement) save passes on both SPEs, proceed to Step 2. 2. Run **test tape long** again to resolve the alarms.
8	FAIL	The announcements are different in both SPEs. The Active SPE has the most current announcements. 1. Issue the **save announcements** command to save announcements in both SPEs. If the announcement save passes on both SPEs, proceed to Step 2. 2. Issue the **test tape long** command again to resolve the alarms.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
9	FAIL	The translations and announcements are different in both SPEs. The Active SPE is the most current.
10	FAIL	The translations and announcements are different in both SPEs. The Standby SPE has the most current translations, and the Active SPE has the most current announcements. 1. Issue the **save translations** command to save translations in both SPEs. 2. Issue the **save announcements** command to save announcements in both SPEs. 3. If both the translation save and announcement save pass on both SPEs, issue the **test tape long** command again to resolve the alarms.
12	FAIL	Load vintages and announcements are different in both SPEs. The Active SPE has the most current announcements.
13	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Active SPE has the most current translations and announcements.
14	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Standby SPE has the most current translations, and the Active SPE has the most current announcements. 1. Follow the procedures for Error Code 4. Be sure to issue the **save announcements** command.
16	FAIL	Announcements are different in both SPEs. The Standby SPE has the most current announcements. 1. Follow the procedures for Error Code 8.
17	FAIL	The translations and announcements are different in both SPEs. The Active SPE has the most current translations and the Standby SPE has the most current announcements.
18	FAIL	The translations and announcements are different in both SPEs. The standby SPE is the most current. 1. Follow the procedures for Error Code 9.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
20	FAIL	Load vintages and announcements are different in both SPEs. The Standby SPE has the most current announcements.
21	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Active SPE has the most current translations and the Standby SPE has the most current announcements.
22	FAIL	The translations, announcements, and load vintages are different in both SPEs. The Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code 4. Be sure to issue the **save announcements** command.
32	FAIL	The update files are different in both SPEs. The update file on the Active SPE is the more current one. 1. Have INADS issue the **copy update-file** command. If the update file copy passes, proceed to Step 2. 2. Reissue the **test tape long** command to resolve the alarms.
33	FAIL	The update files and translations are different in both SPEs. The Active SPE has the most current update file and translations.
34	FAIL	The update files and translations are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current translations. 1. Issue the **save translations** command to save translations on both SPEs. 2. Have INADS issue the **copy update-file** command to copy the update file from the Active SPE to the Standby SPE. 3. Reissue the **test tape long** command to resolve the alarms.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
36	FAIL	The update files and load vintages are different in both SPEs. The Active SPE has the most current update file.
37	FAIL	The update files, load vintages, and translations are different in both SPEs. The Active SPE has the most current update file and translations.
38	FAIL	The update files, load vintages, and translations are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE had the most current translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.
40	FAIL	The update files and announcements are different in both SPEs. The Active SPE has the most current update file and announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Have INADS issue the **copy update-file** command to copy the update file from the Active to the Standby SPE. 3. Issue the **test tape long** command again to resolve the alarms.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
41	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, translations, and announcements.
42	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements, and the Standby SPE has the most current translations. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Have INADS issue the **copy update-file** command to copy the update file from the Active to the Standby SPE. 4. Reissue the **test tape long** command to resolve the alarms.
44	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements.
45	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, translations, and announcements.
46	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and announcements, and the Standby SPE has the most current translations. 1. Follow the procedures for Error Code 4 to get the correct load vintage. Be sure to save announcements. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
48	FAIL	The update files and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current announcements. 1. Follow the procedures for Error Code 40.
49	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and translations, and the Standby SPE has the most current announcements.
50	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code #41.
52	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current update file, and the Standby SPE has the most current announcements.
53	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file, and translations, and the Standby SPE has the most current announcements.
54	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current update file and the Standby SPE has the most current translations and announcements. 1. Follow the procedures for Error Code 4 to get the correct load vintage. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
64	FAIL	The update files are different in both SPEs. The update file on the Standby SPE is most current. 1. If you are on site with the switch, interchange the Active SPE tape with the Standby SPE tape. If you are not on site with the switch, issue the **reset system interchange** command. This action causes the Standby SPE to become the Active SPE. Refer to the "Reset Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for information on the side effects of a processor interchange. 2. Have INADS issue the **copy update-file** command. If the update file copy passes, proceed to Step 3. 3. Reissue the **test tape long** command to resolve the alarms.
65	FAIL	The update files and translations are different in both SPEs. The Standby SPE has the most current update file, and the Active SPE has the most current translations.
66	FAIL	The update files and translations are different in both SPEs. The Standby SPE has the most current update file and translations. 1. Issue the **save translations** command to save translations on both SPEs. 2. Follow the procedures for Error Code #64.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
68	FAIL	The update files and load vintages are different in both SPEs. The Standby SPE has the most current update file.
69	FAIL	The update files, load vintages, and translations are different in both SPEs. The Standby SPE has the most current update file, and the Active SPE has the most current translations.
70	FAIL	The update files, load vintages, and translations are different in both SPEs. The Standby SPE has the most current update file and translations. 1. Follow the procedures for Error Code #4 to get the correct load vintage. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.
72	FAIL	The update files and announcements are different in both SPEs. The Standby SPE has the most current update file and the Active SPE has the most current announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Follow the procedures for Error Code #64.
73	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current translations and announcements, and the Standby SPE has the most current update file.
74	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file and translations. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Follow the procedures for Error Code #64.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
76	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file.
77	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current translations and announcements, and the Standby SPE has the most current update file.
78	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current announcements, and the Standby SPE has the most current update file and translations. 1. Follow the procedures for Error Code #4 to get the correct load vintage. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.
80	FAIL	The update files and announcements are different in both SPEs. The Standby SPE has the most current update file and announcements. 1. Issue the **save announcements** command to save announcements on both SPEs. 2. Follow the procedures for Error Code #64.
81	FAIL	The update files, translations, and announcements are different in both SPEs. The Active SPE has the most current translations, and the Standby SPE has the most current update file and announcements.
82	FAIL	The update files, translations, and announcements are different in both SPEs. The Standby SPE has the most current update file, translations, and announcements. 1. Issue the **save translations** command. 2. Issue the **save announcements** command. 3. Follow the procedures for Error Code #64.

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Table 11-348. TEST #421 Tape Data Consistency Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
84	FAIL	The update files, load vintages, and announcements are different in both SPEs. The Standby SPE has the most current update file and announcements.
85	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Active SPE has the most current translations, and the Standby SPE has the most current update file and announcements.
86	FAIL	The update files, load vintages, translations, and announcements are different in both SPEs. The Standby SPE has the most current update file, translations, and announcements. 1. Follow the procedures for Error Code #4 to get the correct load vintage. After running the **test tape long** command, check for Error Code #32 or #64. Follow the recovery procedure under the applicable error code.
	PASS	The load vintages, translations, announcements, and update files are the same.

TDMODULE (Trunk Data Module)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TDMODULE[1]	MINOR	test port PCSSpp l	Trunk Data Module
TDMODULE (a)	WARNING	test port PCSSpp l	Trunk Data Module

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ...,etc.); and pp is the 2-digit port number (for example, 01).

The TDMODULE (Trunk Data Module) Maintenance documentation is covered in the PDMODULE (Processor Data Module) Maintenance documentation.

TDM-BUS (TDM Bus)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TDM-BUS	MAJOR	test tdm P	TDM Bus
TDM-BUS	MINOR	test tdm P	TDM Bus
TDM-BUS	WARNING	test tdm P	TDM Bus

The TDM Bus consists of a duplicated TDM Bus on each port network (PPN and EPN): TDM Bus A and TDM Bus B. Each TDM Bus consists of 256 time slots. The first five time slots on each bus are called the Control Channel. The Control Channel is active on only one bus at a time in each Port Network. The next 17 time slots are reserved for dedicated tones (that is, dial tone). These time slots are called the dedicated tone time slots and only one bus at a time carries the dedicated tones. The rest of the time slots on each bus are for general system use (that is, phone call).

On system initialization, the Control Channel is on TDM Bus A and the dedicated tones on TDM Bus B in each Port Network.

Systems with High or Critical Reliability have the ability to set the Control Channel and Tone Bus to a specific TDM Bus via the **set tdm PC** command, where **P** stands for the Port Network Number and **C** stands for the TDM Bus A or B (A for TDM Bus A or B for TDM Bus B). Throughout this document, PC is used to refer to a TDM Bus.

Terminology:

- Control Channel Bus - The TDM Bus control channel is on.
- Non-Control Channel Bus - The TDM Bus control channel is NOT on.
- Tone Bus - The TDM Bus dedicated tone time slots are on.
- Non-Tone Bus - The TDM Bus dedicated tone time slots are NOT on.

TDM Bus Fault Detection and Isolation Procedure

TDM Bus faults are most likely caused by a defective circuit pack connected to the backplane or bent pins on the backplane. It is possible that a circuit pack can cause a TDM Bus fault but still exhibit trouble-free operation. For example, the insertion of an MBUS (Memory Bus) only circuit pack can bend the TDM Bus pins on the backplane and short two leads together. The four circuit packs that may cause this problem are the TN770 Memory circuit pack, the TN777 80286 Processor circuit pack, the TN772 Duplication Interface circuit pack, and the TN777 Network Control circuit pack. The latter exists only on High and Critical

Reliability systems. Since the TDM Bus is a shared resource, automatic identification of the cause of a TDM Bus fault is difficult. If a TDM Bus problem is suspected, the system technician should run the **test tdm P** system technician command. If any of the resulting tests fail, then the system technician must manually perform a TDM Bus isolation procedure to identify the cause of the problem.

WARNING:

Since the TDM Bus fault isolation procedure involves removing circuit packs and possibly disconnecting entire carriers, the procedure is extremely destructive to the port network that contains the TDM Bus being tested. If possible, this procedure should be used after hours or during hours with minimum system use.

As circuit packs are removed or entire carriers are disconnected, any active calls terminating on those circuit packs or carriers are dropped. If the system technician has any hints about a particular circuit pack that may be causing the TDM Bus problem (for example, a new circuit pack was inserted into the Port Network just before the TDM Bus problem appeared), then those hints should be investigated before performing this procedure.

For this procedure, make sure at least one Tone Detector circuit pack is in the same Port Network in which the TDM Bus fault is being isolated. The Tone Detector circuit pack is needed by maintenance to test the TDM Bus.

Procedure 1

This procedure is an attempt to isolate the TDM Bus fault to circuit packs that are essential to the system operation. For each of the following circuit packs, perform Procedure 1.

Circuit Pack	Error Log Names
Tone-Clock	TONE-BD, TONE-PT, and TDM-CLK
Network Control	SW-CTL
Tone Detector	DETR-BD, GPTD-PT, and DTMR-PT
Processor Interface	PI-BD and PI-PT
Duplication Interface—only for systems with High or Critical Reliability	DUPINT
Expansion Interface	EXP-INTF

1. Display the Hardware Error and Alarm Logs for the circuit pack via the **display errors** and **display alarms** commands.

2. If there are errors for the circuit pack, refer to its Maintenance documentation and try to resolve the errors.
3. Whether or not all the errors can be cleared, test the TDM Bus again via the **test tdm P** command.
4. If some TDM Bus tests fail, continue with the next circuit pack.
5. If there are no more circuit packs in the list, go to Procedure 2.
6. If all the TDM Bus tests pass, the problem has been fixed.

Procedure 2

This procedure removes and re-inserts port circuit packs (purple slot); one or several at a time.

If all of the TDM Bus tests pass when the circuit pack is removed, but some of the tests fail when the circuit pack is inserted, the circuit pack is the cause of the problem and should be replaced. If some of the tests fail regardless of whether the circuit pack is inserted or removed, the circuit pack is not the cause of the problem (see Note). Repeat this procedure for each purple slot circuit pack in the Port Network.

NOTE:
Of course, in a multiple failure situation, the circuit pack may be one cause of the TDM Bus problem and there may be other failures that are causing TDM Bus faults. Also, the circuit pack itself may not be the cause of the problem, but the backplane pins may have been bent when the circuit pack was inserted.

1. Remove port circuit packs which have failed the NPE Crosstalk Test (#6) first. To find which circuit packs failed this test, display the Hardware Error Log via the **display errors** command. Refer to the Maintenance documentation of each port circuit pack that has port errors to check if any error indicates the failure of the NPE Crosstalk Test.
2. If no circuit pack failed the NPE Crosstalk Test (#6), remove one or several purple slot circuit packs.
3. Run the **test tdm P** command.
4. If any of the TDM Bus tests fail:
   - Check if the backplane pins in the removed circuit pack's slot appear to be bent.
   - If the backplane pins are bent, straighten or replace the pins, re-insert the circuit pack, and do this procedure again for the same circuit pack.
   - If the backplane pins are not bent, re-insert the circuit pack and do this procedure for the next set of circuit packs.
5. If none of the TDM Bus tests fail:

- Re-insert the circuit pack.
- Run the **test tdm** system technician command.
- If any of the TDM Bus tests fail, the re-inserted circuit pack is faulty. Replace the circuit pack and do this procedure again for the new circuit pack.
- If none of the TDM Bus tests fail, then the problem has been fixed.

Procedure 3

This procedure removes and re-inserts control carrier circuit packs one at a time. The Network Control circuit pack and the Processor Interface circuit pack are the only processor complex circuit packs that communicate on the TDM Bus, and thus are the only processor complex circuit packs likely to cause a TDM Bus problem in a stable system. This procedure should be performed for the Processor Interface circuit pack before it is attempted for any other processor complex circuit packs.

In a System Without High or Critical Reliability

To perform this procedure for the Network Control circuit pack, this circuit pack must be replaced. The system cannot operate without the Network Control circuit pack.

1. Power down the control carrier.
2. Remove the suspected circuit pack.
3. Check if the backplane pins in the removed circuit pack's slot appear to be bent.
4. If the backplane pins are bent:
   - Straighten or replace the pins.
   - Insert the same circuit pack.
   - Repeat from Step 2 with the same circuit pack.
5. If the backplane pins are not bent, insert or replace the circuit pack.
6. Turn the power back on to reboot the system.
7. Run the **test tdm P** command.
8. If any of the TDM Bus tests fail:
   - If the circuit pack in Step 5 was inserted, do this step again replacing the circuit pack.
   - If the circuit pack in Step 5 was replaced, do this step again with the next circuit pack.
9. If none of the TDM Bus tests fail, the problem has been fixed.
10. If this step fails to identify the cause of the problem, go to Procedure 4.

In a High or Critical Reliability System

In a High or Critical Reliability system, a less destructive procedure for processor complex circuit packs can be used rather than the one described for standard systems. Once again, the procedure should be performed on the Processor Interface circuit pack and Network Control circuit pack before it is attempted for any other processor complex circuit packs.

Pulling out processor complex circuit packs from the Standby SPE does not require powering down the carrier and does not require starting the system again. See Chapter 8, "Reliability Systems: A Maintenance Aid" for more details.

1. Perform Procedure 2 for the suspected processor complex circuit pack in the Standby SPE to determine if it is causing the TDM Bus problem (see Note). The **status system** command indicates which SPE is in standby mode. If the suspected circuit pack is the Tone-Clock circuit pack, make sure the Tone-Clock circuit pack is in standby mode via the **status system** command or its LED state. The SYSTEM CLOCKS and SYSTEM TONES fields of the status system form should read "standby" or the yellow LED of the circuit pack should be off.

   NOTE:
   When doing Procedure 2 as a request of Procedure 3, pull out processor circuit packs instead of purple slot port circuit packs.

2. If it fails to identify the processor complex circuit pack as the cause of the problem, perform an SPE switch via the **reset system i** command (see Note).

   NOTE:
   Make sure that the current Standby SPE is in the standby mode via the **status system** command before performing the SPE switch.

3. Perform Procedure 2 for the suspected processor complex circuit pack in the new Standby SPE to determine if it is causing the TDM Bus problem.
4. If it fails again to identify the processor complex circuit pack as the cause of the problem, perform Procedure 2 for the remaining processor complex circuit packs.
5. If this procedure fails to identify the cause of the problem, go to Procedure 4.

Procedure 4

Procedure 4 attempts to isolate the failure to a particular set of carriers, and then checks only the circuit packs in those carriers. This procedure involves terminating the TDM Bus so that certain carriers are disconnected from the TDM Bus. This is done by moving the TDM Bus terminators (AHF1) on the carrier backplane. To terminate a TDM Bus at the end of a particular carrier, the TDM Bus cable that connects the carrier to the next carrier should be unplugged and replaced with the TDM Bus terminator. The TDM Bus terminators can be taken from one carrier to the other. To get to the TDM Bus cables, remove the back cover of the cabinet. When the length of the TDM Bus is modified via this procedure, the circuit packs that are essential to system operation and TDM Bus maintenance (for example, Network Control circuit pack, Tone-Clock circuit pack, Tone Detector circuit pack) must still be connected to the new *shortened* TDM Bus.

For the Processor Port Network (PPN)

1. Terminate the TDM Bus so that it extends within the active control carrier.
2. Run the **test tdm** system technician command. If any of the TDM Bus tests fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers connected to the *shortened* TDM Bus. Procedure 2 is performed for port circuit packs (purple slots) and Procedure 3 for control carrier circuit packs.
3. If none of the TDM Bus tests fail, extend the TDM Bus to another carrier and repeat this procedure. When a carrier is added that causes some of the TDM Bus tests to fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.

For the Expansion Port Network (EPN)

1. Terminate the TDM Bus so that it only extends within the carrier containing the active Expansion Interface (EXP-INTF) circuit pack.
2. Run the **test tdm** system technician command. If any of the TDM Bus tests fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers connected to the shortened TDM Bus.
3. If none of the TDM Bus tests fail, extend the TDM Bus to another carrier and repeat this procedure. When a carrier is added that causes some of the TDM Bus tests to fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.

If the above steps fail to identify a particular circuit pack or slot, the problem may be caused by a TDM Bus common component such as the termination resistors on the ends of the bus.

Restarting Nonfunctioning Port Circuit Packs

A defective TDM Bus Control Channel or system timing reference on one of the networks can result in port circuit packs (that is non-control carrier circuit packs) on this defective network entering the reset state. When this situation occurs, the circuit pack stops functioning and its red LED lights. The system does not detect the presence of a circuit pack when the circuit pack is in the reset state. Hence, executing the **list config board PCSS** command indicates that the circuit pack is not present.

If a circuit pack enters the reset state when the control channel is on TDM Bus PT (where network P contains the circuit pack), this circuit pack stops functioning until it receives a restart message when the control channel is on the same TDM Bus PT or when this circuit pack is powered up again.

To force the system to send a restart message to all circuit packs on a network, try one of the following methods depending on the circumstances:

NOTE:
A circuit pack functioning normally (that is, not in the reset state) ignores the restart message.

Procedure 1 (Nondestructive)

Execute the Idle Time Slot Test (#294) by issuing the command **test tdm P** when the control channel is on the same TDM Bus as it was when the circuit pack entered the reset state. If using this method is not feasible, try the other procedures in this section.

Procedure 2 (Non-Destructive)

if you are at the site: Reseat the circuit pack. This action causes the circuit pack that was in the reset state to begin functioning on the *current* Control Channel bus.

Procedure 2 (Nondestructive)

Execute the Idle Time Slot Test (#294) by issuing the command **test tdm P** when the control channel is on the same TDM Bus as it was when the circuit pack entered the reset state. If using this method is not feasible, try the other procedures in the section.

Procedure 3 (Destructive)

Reset the port network that contains the circuit pack that is in the reset state. When a network is reset, two restart messages, one on the control channel of each TDM Bus, are sent to each circuit pack on the network. Executing the **reset system L** command (where L=2, 3, 4, or 5) resets all networks in the system. *To reset an EPN only*, busyout all links to the EPN via the **busyout board PCSS** command and then release them via the **release board PCSS** command.

WARNING:
*The **reset system** command disrupts all calls in the system. Resetting the EPN only disrupts all calls going to and originating from the EPN.*

Procedure 4 (Destructive)

Execute the **recycle carrier PC** command where P is the Port Network Number of the network containing the circuit pack and C is the designation of the carrier containing the circuit pack.

WARNING:

This command removes power and returns power to the designated Medium cabinet port carrier. Thus, any other circuit packs on this carrier is also temporarily taken out-of-service.

Hardware Error Log Entries and Test to Clear Values

TDM Bus Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tdm
1	0	Control Channel Test (#296)	MINOR	ON	test tdm P r 3
18 (a)	0	busyout tdm PC	WARNING	ON	release tdm PC
35 (b)	0-1	TDM Bus Corruption	MINOR	ON	set tdm PC
257 (c)	0	none	MAJOR	ON	
513 (d)	Any	Idle Time Slot Test (#294)	MINOR	ON	test tdm P r 3
769 (e)	Any	Idle Time Slot Test (#294)	WARNING	ON	test tdm P r 3
769 (f)	Any	Idle Time Slot Test (#294)			(see Notes)
1025	Any				
3872 (g)	Any	none			
3873 (g)	Any	none			
3874 (g)	Any	none			
3877 (g)	Any	none			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

NOTE:
For TDM-BUS, an ON-BOARD alarm refers to a problem with the TDM-BUS itself.

Notes:

a. The TDM Bus has been busied out by the technician. The error retires when the technician releases the TDM Bus.

b. This error indicates the TDM Bus is corrupted. If the corruption was on the Control Channel bus and this system has High or Critical Reliability, TDM Bus maintenance automatically switches the control channel and/or tones to the other bus. The same strategy applies if the corruption was on the bus carrying the tones.

An aux data value of 0 indicates the last reported TDM Bus corruption was on the Control channel bus.

An aux data value of 1 indicates the last reported TDM Bus corruption was on the Non-Control channel bus.

If this error is logged on both TDM Buses (A and B) on the PPN within two or three minutes, the red LED of several circuit packs may or may not be lit and there could be Switch Control errors. Under these circumstances do the following:

- Display the Hardware Error Log via the **display errors** command and look for SW-CTL (Switch Control) errors.
- If there are any errors logged against the Switch Control, try to resolve them.
- Test the TDM Bus via the **test tdm P** command.
- If all the TDM Bus tests pass, the problem has been fixed.
- If some of the TDM Bus tests fail, replace the Duplication Interface circuit pack in the A carrier (see Chapter 8, 'Reliability Systems: A Maintenance Aid" for details). None of the Duplication Interface circuit pack tests detect this particular type of failure. Therefore, all its tests may still pass.
- Test the TDM Bus via the **test tdm P** command.
- If all the TDM Bus tests pass, the problem has been fixed.
- If not all the TDM Bus tests pass, escalate the problem.

c. This error indicates the TDM Bus was switched to the other bus due to TDM Bus corruption. The aux data value is not meaningful and no action is required.

d. This error indicates that some time slots are corrupted in the specified TDM Bus. The Minor alarm is raised when there are more than 50 bad time slots in the bus. The aux data indicates the number of bad time slots found by the test.

e. This error indicates that some time slots are corrupted in the specified TDM Bus. The Warning alarm is raised when there are more than 10 bad time slots but less than or up to 50 bad ones in the bus. The aux data value indicates the number of bad time slots found by the test.

f. This error indicates the idle time slot test found less than 10 bad time slots in the TDM Bus. The aux data value indicates the number of bad time slots found by the test. There is no alarm associated with this error.

g. These errors indicate communication problems. On a High or Critical Reliability system, TDM Bus maintenance may switch the Control Channel bus and/or Tone bus to the other bus. Test the TDM Bus via the **test tdm P** command and follow the procedures according to the error codes reported from the test.

The aux data value shows the Angel ID number for which a downlink message was lost.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Control Channel Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Test on the Control			
Channel Bus (#296)	X	X	ND
Digit Detection Test on the Non-Control			
Channel Bus (#297)	X	X	ND
Idle Time Slot Test on TDM Bus A (#294)	X	X	ND

1 D = Destructive; ND = Nondestructive

Idle Time Slot Test on TDM Bus A or B (#294)

The Idle Time Slot Test detects noisy time slots on the bus and takes them out-of-service. The Tone Detector circuit pack is told to listen to idle time slots and if it detects any noise on a time slot, it returns a failure. At the end of the test, any out-of-service time slots are retested to see if they are still noisy and restored to service if they are idle. After all the time slots have been tested, maintenance counts the number of bad time slots and reports the number to the technician in the error code field. No more than 220 time slots are taken out-of-service on one bus, and no more than 300 are taken out-of-service on both buses at one time.

Table 11-349. TEST #294 or #295 Idle Time Slot Test on TDM Bus A or TDM Bus B

Error Code	Test Result	Description/ Recommendation
none	ABORT	Could not allocate the necessary system resources to run this test. For example, maintenance could be running on the Tone Detector circuit pack and it is using the CPTRs.
1115	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
number	FAIL	The error code indicates the number of bad time slots that were detected. The cause of this failure is most likely due to a bad port circuit pack and not the TDM Bus itself. 1. Execute the command again. 2. If the error persists, check the Error and Alarm Logs for alarms on port circuit packs from the NPE Crosstalk Test. 3. Refer to the appropriate circuit pack's documentation to clear the circuit pack's problem. 4. Test the TDM Bus again. If the error continues, refer to the "TDM Bus Fault Detection and Isolation Procedure" described earlier.
	PASS	The success of this test indicates all the idle time slots that are supposed to be idle are indeed idle. There is no noise on any of the idle time slots.

Control Channel Test (#296)

This test tests the integrity of the Control Channel bus. It ensures that communication through the TDM Bus is operational.

Table 11-350. TEST #296 Control Channel Test

Error Code	Test Result	Description/ Recommendation
any code other than 1005	ABORT	Internal System Error. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Since this test is valid only on the control channel bus, it aborts execution when run on the non-control channel bus. This is a valid response. Use the **status system** command to verify which bus is the control channel bus.
none	FAIL	Communication through the Control Channel is not working. The problem is not necessarily the TDM Bus itself. 1. Display the hardware error and alarm log for the Tone-Clock circuit pack. Refer to TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation. 2. Resolve the errors for the Tone-Clock circuit pack. 3. Display the hardware error and alarm log for the Network Control circuit pack. Refer to DATA-BD (Network Control Circuit Pack) Maintenance documentation. 4. If this error is on the EPN, display the hardware error and alarm log for the Expansion Interface. Refer to EXP-INTF (Expansion Interface Circuit Pack) Maintenance documentation and resolve its errors. 5. Execute the **test tdm P** command again. 6. If the test still fails, refer to the "TDM Bus Fault Detection and Isolation Procedure" described earlier.
	PASS	Communication through the TDM Bus is operational.

Digit Detection Test (#297)

This test is executed on the Non-Control Channel bus. The Tone-Clock circuit pack is told to put a tone on the Non-Control Channel bus and the Tone Detector circuit pack is told to listen to it. The test passes if the tone is successfully transmitted on the Non-Control Channel bus.

Table 11-351. TEST #297 Digit Detection Test

Error Code	Test Result	Description/ Recommendation
none, 1001 2100	ABORT	Could not allocate the necessary system resources to run this test.
1005	ABORT	Since this test is valid only on the non-control channel bus, it aborts execution when run on the control channel bus. This is a valid response. Use the **status system** command to verify which bus is the control channel bus.
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
none	FAIL	This failure indicates that communication on the Non-Control Channel is not reliable. 1. Execute the command again. 2. If the problem persists, test the Tone-Clock circuit pack and Tone Detector circuit pack to make sure they are healthy. Refer to TONE-BD (Tone-Clock Circuit Pack), TONE-PT (Tone Generator), GPTD-PT (General Purpose Tone Detector Port), and DTMR-PT (Dual Tone Multifrequency Port). 3. Execute the command again. 4. If the problems persists, refer to the "TDM Bus Fault Detection and Isolation Procedure" described earlier.
	PASS	The non-control channel bus is operational.

TDM-CLK (TDM Bus Clock)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
TDM-CLK	MAJOR	test tone-clock PC short	TDM Bus Clock
TDM-CLK	MINOR	test tone-clock PC short	TDM Bus Clock
TDM-CLK	WARNING	release tone-clock PC	TDM Bus Clock

1 P is the port network number (1 for PPN, 2 -3 for EPNs). C is the carrier designation (A, B, C, D, or E).

NOTE:
Replacing the tone/clock circuit pack requires a special procedure which is described in the documentation for TONE-BD. That section also describes the LED display for this board.

The Time Division Multiplex (TDM) Bus Clock resides on the Tone-Clock circuit pack, providing clocking signals both for the TDM Bus and the LAN Bus. The Tone-Clock circuit pack is a critical component in the system and is necessary to ensure the operation of all port circuit packs in the system. The TDM busses of the Processor Port Network (PPN) and any Expansion Port Networks (EPNs) are synchronized together. The system timing reference can be derived internally from the Tone-Clock circuit pack in any PN, or from an external (off-board) timing reference. Currently, the TDM Bus Clock supports synchronizing the TDM Bus with interface rates from Digital Signal 1 (DS1) facilities as primary or primary and secondary references, and from Stratum 3 Clock (STRAT-3) facilities. Only the TN780 tone-clock supports a Stratum 3 clock.

The Tone-Clock circuit pack aids in monitoring and selecting synchronization references. The Tone-Clock circuit pack, after detecting that the external source of timing is not valid, will automatically begin its escalation procedure, according to the facilities administered. In the following table, successive losses of signal cause escalation from left to right.

NOTE:
Switching back to a DS1 source is handled by synchronization maintenance, once any problems with it have been corrected and tested. However, once synchronization has been switched to the internal timing source of the master Tone-Clock circuit pack, *switching back to a Stratum 3 Clock must be initiated by a technician* after the external reference has been repaired.

Synchronization Source Escalation Strategy

Tone-Clock Role	Synchronization Facilities	Initial External Synchronization Source	Backup External Synchronization Source	Internal Source
MASTER	Stratum 3 Clock	Source "A"	Source "B"	Local oscillator
	DS1 Primary and Secondary	DS1 Primary	DS1 Secondary	
	DS1 Primary Only	DS1 Primary	None	
	No External Source	None	None	
SLAVE	PNC Duplication	Active EI	Standby EI	
	No PNC Duplication	Active EI	None	

See Synchronization (SYNC) Maintenance documentation for more details of the escalation plan. *There exists a strong interdependency among the DS1 Interface circuit pack Maintenance, Synchronization Maintenance, and TDM Bus Clock Maintenance MOs*.

See the section on TONE-BD Maintenance in this manual for a discussion of the relationship of Tone-Clock circuit packs with the various Reliability Options.

Hardware Error Log Entries and Test to Clear Values

TDM Bus Clock Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tone-clock PC sh r 1
1 (a)	0	None	MINOR	OFF	
18 (b)	0	busyout tone-clock PC	WARNING	OFF	release tone-clock PC
130 (c)		None			
257 (d)		None	WARNING	ON	
513 (e)	Any	Clock Circuit Status Inquiry (#148)	MINOR[2]	OFF	test tone-clock PC
769 (f)	Any	Clock Circuit Status Inquiry (#148)	MAJOR	ON	test tone-clock PC sh r 10
1025 (g)	Any	Clock Slip Inquiry (#149)			test tone-clock PC sh
1281(h) 1282(h)	Any	None	MINOR	OFF	
1537	Any	Clock PPM Inquiry (#150)			test tone-clock PC sh
2049(i)	Any	Standby Reference Health Check Test (#651)	MAJOR[2]	ON	test tone-clock PC
2305(j)	0	None	WARNING	OFF	

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Major or MINOR alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. The Tone-Clock circuit pack may have a clock at the edge of its specified frequency. This can cause Expansion Interface circuit packs and SNI circuit packs to go out-of-frame or report no-neighbor conditions. This can is turn cause EPNs, Expansion Archangel Links (EALs), Remote Neighbor Links (RNLs), and/or Local Neighbor Links LNLs) to go down. When this error is alarmed, Clock Health Inquiry Test (#46) will fail with an error code of 1.

1. Replace the Tone-Clock circuit pack identified in the error log. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.
2. If the error persists, follow normal escalation procedures.

b. The indicated Tone-Clock circuit pack has been made unavailable via the **busyout tone-clock PC** command. It only applies to systems which have the High or Critical Reliability Option, because only a standby Tone-Clock circuit pack may be made busy by that command. To resolve this error, execute the **release tone-clock PC** command for the alarmed circuit pack.

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. The Tone-Clock circuit pack in the PPN is not a TN780 while a Stratum 3 synchronization is administered. Replace the Tone-Clock in the PPN with a TN780, or change synchronization administration to Stratum 4 if a Stratum 3 clock is not being used.

e. The TN2182 tone-clock has reported an out-of-lock condition. A aux value of 1 indicates this error is an out-of-lock with the primary reference. A aux value of 2 indicates this error is an out-of-lock with the secondary reference. It could not lock onto the frequency of that synchronization reference. This will lead to a change in the synchronization reference if the condition continues.

f. This error indicates that the Tone-Clock circuit pack may be defective.

1. If this error was logged against the Active Tone-Clock circuit pack, then test the Active Tone-Clock circuit pack via the **test tone-clock PC**. If there are any error codes from any tests, follow the recommended maintenance procedures for the error code(s) to resolve the problem(s). If the problem(s) persists, follow normal escalation procedures.
2. If this error was logged against the Standby Tone-Clock circuit pack, and if the Aux Data value was 18369, Synchronization maintenance acts on this error. No corrective action is required. For all the other Aux Data values, replace the Standby Tone-Clock circuit pack. Refer to the TONE-BD section on "How to Replace a Tone-Clock Circuit Pack".
3. If the error persists, follow normal escalation procedures.

g. Tone-Clock circuit pack on-board maintenance has detected one or more clock slips, timing differences between its internal reference source and the synchronization signal provided by the master Tone-Clock. Although no clock slip errors are expected during normal operation, both manual and automatic interchanges of Tone-Clock circuit packs, synchronization references, and EI link switches, may result in clock slip counts.

If error 1281 is also logged for the same Tone-Clock circuit pack, it is related to this problem and should be corrected first. Otherwise, continue with the procedure below.

1. Use **test tone-clock PC** and examine the results of test #149 to see if slip errors are still occurring. If no new slip errors are reported, and if these errors are not causing a TDM-CLK alarm, they may be ignored. Use **test tone-clock PC long clear** to clear the errors.
2. Otherwise, enter the **display errors** command and follow corrective procedures for any other TDM-CLK, TONE-BD, SYNC, and EXP-INTF errors logged, except for those in the following table.

Circuit Pack Name	Error Log Name	Error Log Entry for Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160

3. If 1025 errors persist, refer to SYNC Maintenance in this manual. If this still does not resolve the error, follow normal escalation procedures.

h. Error Type 1281—This error is an indication that the Tone-Clock circuit pack has detected a loss of timing signal from the system synchronization reference. The Tone-Clock circuit pack has switched synchronization references, according to the strategy described in the preceding table on Synchronization Escalation.

1. Resolve any errors logged against the SYNC or STRAT-13 maintenance objects.
2. Refer to SYNC maintenance, in the “Approach to Troubleshooting” section, if the error is not resolved by step 1
3. If the error persists, follow normal escalation procedures.

Error Type 1282—Indicates that the TN2182 tone-clock was synchronized to a DS1 facility and that the reference frequency provided by the DS1 drifted beyond a range that could be tracked by the TN2182. Therefore the TN2182 is no longer synchronized to that DS1 reference. If a second DS1 is available, the tone-clock may be synchronized to that reference. If no secondary DS1 reference is available, the tone-clock will run off of its internal clock. This may result in slips being reported by the tone-clock and all DS1 facilities.

i. The tone-clock circuit pack in the master port network was unable to detect the incoming synchronization signal, but the other tone-clock was able to detect the references. If the aux data is 0, the problem is with the signal on the primary. If the aux data is 1, the problem is with the signal on the secondary. The system should switch clocks in this situation.

1. If this error is against a PPN clock board and the system is using a Stratum 3 clock, check the cabling that brings the stratum 3 signal to this clock board.
2. Replace the current standby Tone-Clock circuit pack. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.
3. If the error persists, follow normal escalation procedures.

j. The indicated active Tone-Clock circuit pack, which is on a port network that does not contain the system synchronization reference (a **slave** Tone-Clock), has detected a loss of timing signal from its EXP-INTF synchronization source.

1. Enter **display errors** and **display alarms**, and follow the associated repair procedures for EXP-INTF, TDM-CLK, and TONE-BD error log entries that have on-board alarms.
2. If the 2305 errors persist, follow the repair procedures for EXP-INTF error log entries 257, 769, or 770.
3. If the 2305 errors persist:

    d. *For Port Networks with more than one Tone-Clock circuit pack*, execute the command **test synchronization r 10**, and check to see if new 2305 errors against TDM-CLK were reported. If not, execute **set expansion-interface** and then **test synchronization r 10** again, and recheck for new 2305 errors against TDM-CLK.

    e. *For Port Networks with a single Tone-Clock circuit pack*, execute the command **test synchronization r 10**, and check to see if new 2305 errors were reported.

    If no new instances of the 2305 errors were logged for either test, then enter **test tone-clock PC long clear** to clear the TDM-CLK errors and the procedure is complete.

4. **For Port Networks with more than one Tone-Clock circuit pack**, interchange Tone-Clocks with the **set tone-clock PC**, then run **test synchronization r 10**, and check to see if new 2305 errors are reported against the new active Tone-Clock circuit pack. If not, replace the standby Tone-Clock circuit pack. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section. If this clears the error, the problem has been resolved.
5. Replace the EI circuit pack for the active EXP-LNK.
6. If the problem is still not cleared, and the Tone-Clock circuit pack reported in the error log has not been replaced up to now, replace it. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.
7. If the problem persists, follow normal escalation procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Use the **list configuration control** command to find the Tone-Clock circuit pack code of the system, and then proceed to look for the Short and Long Test Sequences according to the Tone-Clock circuit pack code.

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *SAKI Reset Test*, for example, you may also clear errors generated from other tests in the testing sequence.

For a system with a TN756 Tone-Clock Circuit Pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Reset Test (#53) (a)		X	D
Clock Health Test (#46) (b)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Detection Verification Test (#42) (c)	X	X	ND
Tone Detector Audit/Update Test (#43) (c)	X	X	ND
Tone Generator Crosstalk Test (#90) (d)		X	ND
Tone Generator Transmission Test (#40) (d)	X	X	ND
Tone Generator Audit/Update Test (#41) (d)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for descriptions of these tests.

b. Refer to TONE-BD (Tone-Clock Circuit Pack) documentation for a description of this test.

c. Refer to Dual Tone Multifrequency Receiver Port (TTR) (DTMR-PT) or General Purpose Tone Detector Port (CPTR) (GPTD-PT) Maintenance documentation for descriptions of this test.

d. Refer to TONE-PT (Tone Generator) documentation for descriptions of these tests.

For a system with a TN768,TN780 or TN2182 Tone-Clock Circuit Pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Reset Test (#53) (a)		X	D
Clock Health Test (#46) (b)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Generator Crosstalk Test (#90) (c)		X	ND
Tone Generator Transmission Test (#40) (c)	X	X	ND
Tone Generator Audit/Update Test (#41) (c)	X	X	ND
TDM Bus Clock Circuit Status Inquiry Test (#148)	X	X	ND
TDM Bus Clock Slip Inquiry Test (#149) (e)	X	X	ND
TDM Bus Clock PPM Inquiry Test (#150)	X	X	ND
TDM Clock Board Type (#574)		X	ND
TDM Bus Clock Parameter Update Test (#151)	X	X	ND
Standby Reference Health Check Test (#651) (d)		X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for descriptions of these tests.

b. Refer to TONE-BD (Tone-Clock Circuit Pack) documentation for a description of this test.

c. Refer to TONE-PT (Tone Generator) documentation for descriptions of these tests.

d. This test only runs on the Standby Tone-Clock circuit pack in a Port Network with more than one Tone-Clock circuit pack (High or Critical Reliability Option). The circuit pack must be a TN780 code with firmware revision 2 or above or be a TN2182.

e. Test #149 is not run on a TN2182.

TDM Bus Clock Circuit Status Inquiry Test (#148)

The TDM Bus Clock circuitry is checked for sanity. Any problems that are found are reported via error codes.

Table 11-352. TEST #148 TDM Bus Clock Circuit Status Inquiry Test

Error Code	Test Result	Description/ Recommendation
None 1001	ABORT	The system could not allocate the necessary resources for the test. 1. Wait 1 minute, and retry the test. 2. If the test continues to abort, follow normal escalation procedures.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
1	FAIL	This error means the Tone-Clock circuit pack framing verification firmware reports an error in the clock synchronization signal coming into this Port Network. 1. If the Tone-Clock circuit pack reporting the problem is a master clock, then the system synchronization reference is providing a bad timing source. Refer to SYNC (Synchronization) or STRAT-3 (Stratum 3 Clock) Maintenance documentation to change the system synchronization reference. 2. If the Tone-Clock circuit pack is a slave clock, then the EI to which it is listening is providing a bad timing source. Follow the diagnostic procedures specified for TDM-CLK Error Code 2305. 3. If no problem can be found with the incoming synchronization signal, replace the Tone-Clock circuit pack. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.

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Table 11-352. TEST #148 TDM Bus Clock Circuit Status Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	This error indicates that the Tone-Clock circuit pack has inaccurately detected loss of signal on the incoming synchronization timing source.
4 8	FAIL	The local oscillator on the Tone-Clock circuit pack has failed.
16 32	FAIL	The circuitry on the Tone-Clock circuit pack used to detect synchronization timing errors has failed. 1. Errors 2, 4, 8, 16, and 32 indicate that there is poor synchronization between port networks and external facilities. It may be noticeable to the customer in the form of errors in data communications. The Tone-Clock circuit pack is defective. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.
64	FAIL	This message is only sent when an uplink message has reported the loss of valid synchronization timing information coming into this Port Network. It has been reported in TDM-CLK Error Log entries; one or more of 1025, 1281, 1537, 2049 and 2305. 1. Resolve the errors indicated. No separate corrective action is required.

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Table 11-352. TEST #148 TDM Bus Clock Circuit Status Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
65	FAIL	The tone-clock is currently not able to lock on to the current synchronization reference. If this tone-clock is in the master port networK: 1. Examine the error log for any DS1-BD, SYNC or other TDM-CLK errors and resolve as applicable. 2. Run this test again via the test tone-clock PC command. 3. Examine the DS1 measurements to determine if the facility is healthy. 4. Adminsiter a new synchronization reference. 5. Replace the DS1 board currently supplying the reference. If this tone-clock is in the slave port networK: 1. Examine the error log for any SYNC, EXP-INTF or other TDM-CLK errors. 2. Run this test again via the test tone-clock PC command.
66	FAIL	There is an on-board failure of TDM clock hardware. 1. Replace this faulty tone-clock circuit pack.
	PASS	TDM Bus Clock Circuit Status is sane. There are no clock-detection circuit problems on the Tone-Clock circuit pack.

TDM Bus Clock Slip Inquiry Test (#149)

This test evaluates the quality of the synchronization source for the Tone-Clock circuit pack. This test does not apply to the TN2182.

Table 11-353. TEST #149 TDM Bus Clock Slip Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The system could not allocate the necessary resources for the test.
1001	ABORT	The system could not allocate the necessary resources for the test. 1. Wait one minute, and retry the test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
ANY	FAIL	This error represents the number of timing slips detected on the incoming synchronization source since the last slip inquiry was sent to the Tone-Clock circuit pack. The incoming synchronization source can be from one of three sources: (1) a DS1 Interface circuit pack, (2) an EXP-INTF circuit pack if the port network on which the test was executed does not contain the current system synchronization reference; (3) a local oscillator on an Active Tone-Clock circuit pack. The error code is a variable amount ranging from 1 to 255. 1. If there are errors against synchronization (SYNC), refer to the Synchronization Maintenance documentation to change the system synchronization reference. 2. If there are errors against DS1 Interface circuit pack (DS1-BD), refer to the DS1 Interface circuit pack Maintenance documentation to resolve the errors.

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Table 11-353. TEST #149 TDM Bus Clock Slip Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY *(cont'd.)*	FAIL	3. If there are no SYNC or DS1-BD errors and a. this error was logged against the Tone-Clock circuit pack that was the current system synchronization reference at the time (use the command **status synchronization** to determine this), replace this Tone-Clock circuit pack. Refer to the "How to Replace a Tone-Clock Circuit Pack" section. **NOTE:** Disruption may occur when executing the following procedures. If the system does not return to normal after these procedures are completed, escalate the problem. b. the Tone-Clock circuit pack you are testing is in Active mode but does not contain the current system synchronization reference, switch the synchronization reference to the Tone-Clock circuit pack under test via the **set synchronization PC** command. Retry the command. If the error is still present, replace this Tone-Clock circuit pack. Refer to the "How to Replace a Tone-Clock Circuit Pack" section. c. the Tone-Clock circuit pack under test is in Standby mode, make it active via the **set tone-clock PC** command and switch the synchronization reference to it. Reissue the command. If the error is still present, replace this Tone-Clock circuit pack. Refer to the "How to Replace a Tone-Clock Circuit Pack" section. If the problem persists, escalate the problem.
	PASS	The Tone-Clock circuit pack does not detect any timing slips. This indicates that the external synchronization timing source is valid or that the system synchronization reference is a Tone-Clock circuit pack. The **status synchronization** command should be used to verify that the desired synchronization reference is providing timing for the system.

TDM Bus Clock PPM Inquiry Test (#150)

This test evaluates the quality of the synchronization source for the Tone-Clock circuit pack.

Table 11-354. TEST #150 TDM Bus Clock PPM Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The system could not allocate the necessary resources for the test.
1001	ABORT	The system could not allocate the necessary resources for the test. 1. Wait 1 minute, and retry the test. 2. If the test continues to abort, follow normal escalation procedures.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
255	ABORT	The test was not executed because the Tone-Clock circuit pack was using its local oscillator rather than synchronizing to an external source. 1. Verify that this Tone-Clock circuit pack is expected to be the synchronization source. If not, correct the synchronization information and re-execute the test.

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Table 11-354. TEST #150 TDM Bus Clock PPM Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	This error represents the number of PPM errors detected on the external synchronization source since the last PPM inquiry was sent to the Tone-Clock circuit pack. A failure of this test indicates that we are outside of Stratum 4 or Stratum 3 timing specifications on the external timing source. This error produces an invalid timing signal for any system that uses this source for a synchronization reference. The error code is a variable amount ranging from 1 to 254. 1. If there are errors against SYNC (Synchronization), refer to SYNC (Synchronization) Maintenance documentation to change the system synchronization reference, OR 2. If there are errors against STRAT-3 (Stratum 3 Clock), refer to the STRAT-3 (Stratum 3 Clock) Maintenance documentation to resolve the errors, OR 3. If there are errors against DS1-BD (DS1 Interface circuit pack), refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation to resolve the errors, OR

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Table 11-354. TEST #150 TDM Bus Clock PPM Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
ANY *(cont'd.)*	FAIL	4. If there are no other errors besides Error Type 1537 against TDM-CLK and if this error was logged against the Tone-Clock circuit pack that provided the current system synchronization reference (use the **status synchronization** command to determine this), replace the defective Tone-Clock circuit pack. Refer to the "How to Replace a Tone-Clock Circuit Pack" section in this Maintenance documentation. **WARNING:** *Since service may be disrupted when the following procedures are carried out, try to perform the following steps when it is convenient for the customer.* 5. If the Tone-Clock circuit pack under test is in the Active mode but is not providing the current system synchronization reference, switch the synchronization reference to the Tone-Clock circuit pack under test using the **set synchronization PC** command. Rerun the test. If the test still fails, replace the defective Tone-Clock circuit pack (refer to the "How to Replace a Tone-Clock Circuit Pack" section in this Maintenance documentation). 6. If the Tone-Clock circuit pack under test is in the Standby mode place it in the Active mode via the command **set tone-clock PC**. Switch the synchronization reference to the Tone-Clock circuit pack under test using the **set synchronization PC** command. Rerun the test. If the test still fails, replace the defective Tone-Clock circuit pack (refer to the "How to Replace a Tone-Clock Circuit Pack" section in this Maintenance documentation). If problems persist, follow normal escalation procedures.

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Table 11-354. TEST #150 TDM Bus Clock PPM Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Tone-Clock circuit pack does not detect timing any PPM errors. This indicates that the external synchronization timing source is valid or that the system synchronization reference is a Tone-Clock circuit pack. The **status synchronization** command should be used to verify that the desired synchronization reference is providing timing for the system.

TDM Bus Clock Parameter Update Test (#151)

This action updates the Tone-Clock internal circuit pack parameters. Tone-Clock circuit pack:

- Disable in-line duplication status messages.
- Disable in-line subrate frame maintenance messages (TN768, TN780 only).
- Set the PPM threshold at 60 PPM for TN768 and TN780. Set the PPM threshold at 85 PPM for TN2182.
- Enable PPM threshold switching
- Set the number of slips to trigger *loss of signal* - currently 30 per 5 millisecond period
- Enable the on-board synchronization switching algorithm (see above)
- Enable holdover operation (TN2182 only).

This is not a test and will always pass without identifying or reporting any Tone-Clock circuit pack errors.

Table 11-355. TEST #151 TDM Bus Clock Parameter Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, follow normal escalation procedures.
	PASS	The Tone-Clock circuit pack parameters have been successfully updated.

TDM-Clock Circuit Pack Type Test (#574)

The purpose of this query is to check if the required type of Tone-Clock circuit pack (TN780) is present when the Stratum 3 clock is administered.

Table 11-356. TEST #574 TDM Clock Circuit Pack Type Test

Error Code	Test Result	Description/ Recommendation
	ABORT	The system could not allocate the necessary resources to run the test. 1. Wait one minute and retry the test.
	FAIL	The Tone-Clock circuit pack in the system is not a TN780. The Stratum 3 clock requires a TN780 Tone-Clock circuit pack. 1. Replace the Tone-Clock circuit pack with a TN780. The old circuit pack may still be good, and need not be discarded.
	PASS	The required TN780 circuit pack is present.

Standby Reference Health Check Test (#651)

This test evaluates the quality of the external synchronization timing source for the Standby Tone-Clock circuit pack.

Table 11-357. TEST #651 Standby Reference Health Check Test

Error Code	Test Result	Description/ Recommendation
	ABORT	This test may already be running due to a tone-clock installation, scheduled maintenance, alarm activity, or a technician-demand test from another terminal. This abort can also occur due to an internal system error. 1. Try the command again at 1-minute intervals up to five times. 2. If the test continues to aboft, escalate the procedure.
1184	ABORT	This test requires an external synchronization source to be administered (DS1 primary, DS1 primary and secondary, or Stratum 3 Clock). 1. Administer the external synchronization source and retry the test.
2500	ABORT	Internal System Error 1. Try the command again at 1-minute intervals up to 5 times. 2. If the test continues to abort, follow normal escalation procedures.
0	FAIL	**If the Tone-Clock circuit pack is in the PPN**, the external synchronization timing source for side A of the Stratum 3 clock, or for the Primary DS1 reference is either absent or invalid. **If the Tone-Clock circuit pack is in an EPN**, the synchronization reference from the active EI circuit pack is either absent or invalid.

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Table 11-357. TEST #651 Standby Reference Health Check Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	**If the Tone-Clock circuit pack is in the PPN**, both external synchronization timing sources are either absent or invalid. **If the Tone-Clock circuit pack is in an EPN**, the synchronization references from both EI circuit packs are either absent or invalid. 1. Correct the synchronization source problem. Refer to the Synchronization (SYNC) maintenance section of this manual. 2. If the error still exists, replace the Tone-Clock circuit pack reported in the error log. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section. 3. If the problem has not been corrected, follow normal escalation procedures.
	PASS	The external synchronization timing source is valid.

TIE-BD (Tie Trunk Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
TIE-BD	MIN	test board PCSS sh	Tie Trunk Circuit Pack
TIE-BD	WRN	test board PCSS sh	Tie Trunk Circuit Pack

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.).

Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for circuit pack level errors. See also TIE-TRK (Tie Trunk).

TIE-DS1 (DS1 Tie Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TIE-DS1[1]	MAJOR[2]	test trunk <grp/mbr> l	DS1 Tie Trunk
TIE-DS1	MINOR	test trunk <grp/mbr> l	DS1 Tie Trunk
TIE-DS1	WARNING	test trunk <grp/mbr>	DS1 Tie Trunk

1 For additional repair information, see also DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

The DS1 tie trunk provides both voice and data inter-PBX communication. A 24 channel DS1 Interface circuit pack can support up to 24 digital tie trunks through a 1.544 Mbps DS1 link. A 32 channel DS1 Interface circuit pack can support up to 30 digital tie trunks through a 2.048 Mbps DS1 link. DS1 Interface circuit packs are described in DS1-BD. DS1 Tie Trunks are used widely in the DCS and Central Attendant Service (CAS) features of the system.

A DS1 tie trunk can also be used as an access endpoint which is a non-signaling channel with a bandwidth of voice-grade-data, 56K-data or 64K-data.

DS1 tie trunk maintenance provides a strategy to maintain a DS1 tie trunk via a port on the DS1 Interface circuit pack. The maintenance strategy covers logging DS1 tie trunk hardware errors, running tests for trunk initialization, periodic and scheduled maintenance, system technician-demanded tests, and alarm escalation and resolution. Three different trunk service states are specified in the DS1 tie trunk maintenance. They are: *out-of-service* in which the trunk is in a deactivated state and cannot be used for either incoming or outgoing calls; *in-service* in which the trunk is in an activated state and can be used for both incoming and outgoing calls; *disconnect* (ready-for-service) in which the trunk is in an activated state but can only be used for an incoming call. If the DS1 Interface circuit pack is out-of-service, all trunks on the DS1 Interface circuit pack are placed into out-of-service state, and a Warning alarm is raised.

Hardware Error Log Entries and Test to Clear Values

DS1 Tie Trunk Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test trunk <grp>/<mbr> sh r 1>
1 (a)	57476 57477 57485 57487				
15 (b)	Any	Port Audit and Update Test (#36)			
18 (c)	0	busyout trunk <grp>/<mbr>	WARNING	OFF	release trunk <grp>/<mbr>
130 (d)		None	WARNING	ON	test trunk <grp>/<mbr>
257 (e)	57473 57474				
513(f)	57392	DS1 Tie Trunk Seizure Test (#136)	MIN/MAJ[2]		
769(g)	57393	DS1 Tie Trunk Seizure Test (#136)	MIN/MAJ[2]		
1025		DS1 Tie Trunk Seizure (Test #136)	MAJ/MIN/ WRN[3]	OFF	test trunk <grp>/<mbr> r 2
1281		Conference Circuit (Test #7)	MAJ/MIN/ WRN[3]	ON	test trunk <grp>/<mbr> l r 4
1537		NPE Crosstalk Test (#6)	MAJ/MIN/ WRN[3]	ON	test trunk <grp>/<mbr> l r 3
1793 (h)					test board PCSS long
2305(i)	50944	DS1 Tie Trunk Seizure Test (#136)	MIN/MAJ[3]	OFF	

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DS1 Tie Trunk Maintenance Error Log Entries

2562(j)	16665				
2817(k)	52992				
3840 (j)	Any	Port Audit and Update (Test #36)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This alarm will only be raised when the System-Parameter Country form has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the MINOR alarm is not downgraded by the **set options** values, the MINOR alarm is upgraded to a MAJOR alarm if 75 percent of the trunks in this trunk group are alarmed.

a. Error Type 1—The DS1 Interface circuit pack detects a hardware error on the DS1 tie trunk. This error can be caused by incompatible translations. Make sure the parameters administered on the DS1 circuit pack form match those administered on the far-end switch. See *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653, and *DEFINITY Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT/ISDN-PRI Reference*, 555-025-107, for details.

   The Aux Data field indicates the following hardware error types:

57476	On-hook before wink
57477	On-hook before ready to receive digits
57485	Wink too short for valid signal
57487	The timer expired while waiting for an off-hook signal from the far end as a response at end of digits dialing. Check the far-end switch for related problems.

   If all administration errors between the switch and the far-end match, and these errors continue to recur, follow normal escalation procedures.

b. Error Type 15—This is a software audit error that does not indicate any hardware malfunction. Run Short Test Sequence and investigate associated errors (if any).

c. Error Type 18—The DS1 tie trunk has been busied out by a **busyout trunk** grp/mbr command. No calls can be made on this trunk except for the Facility Access Test Call. Facility Access Test Calls are describe in Chapter 6, "Accessing Alarms and Errors" and in *DEFINITY Communications System Generic 3 Feature Description,* 555-230-204.

d. Error Type 130—This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. Error Type 257—The DS1 Interface circuit pack detects a hardware error on the DS1 tie trunk. The trunk cannot communicate with the far end because it is unable to interpret digits sent from the far-end switch. The Aux Data field indicates the following:

57473	The rotary dial rate is below 8 pulses per second.
57474	The rotary dial rate is above 12 pulses per second.

Check with the far-end switch or operating company for proper trunk connection.

f. Error Type 513—DS1 Interface circuit pack detects a hardware error on the DS1 tie trunk. The trunk is in-service/active and waiting for an ‘‘on-hook’’ from the far-end switch. No calls can be routed over the trunk while it is in this state. Aux Data 57392 indicates no external release on PBX disconnect. Check with the far-end switch or operating company for proper trunk connection.

g. Error Type 769—The DS1 Interface circuit pack detects a hardware error on the DS1 tie trunk. This error usually occurs after one or more occurrences of error type 513. The trunk has received the belated ‘‘on-hook’’ that it has been waiting for from the far-end switch. The trunk is restored to in-service/idle and can be used for calls. Aux Data 57393 indicates delayed external release on PBX disconnect. This error can be ignored.

h. Error Type 1793—The DS1 Interface circuit pack is out-of-service. See the appropriate DS1-BD/UDS1-BD (DS1/UDS1 Interface Circuit Pack) Maintenance documentation for details.

i. Error Type 2305—Reorder message. The trunk could not be seized. This error will cause the Trunk Seizure Test (#136) to run and is only considered a problem if the Seizure Test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in “Ready-for-Service’’ state (shown as ‘‘disconnected’’ by the status command), which allows only incoming calls. Run the Trunk Seizure Test (#136) and follow its outlined procedures.

j. Error Type 2562—Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

k. Error Type 2817—Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a two-way trunk from both the near-end and the far-end. Attempt to place the call again. If the error persists, execute the DS1 Tie Trunk Seizure Test (#136) and follow its outlined procedures.

l. Error Type 3840—Port Audit and Update Test (#36) failed due to an internal system error. Enter **status trunk** command and verify the status of the trunk. If the trunk is out-of-service, then enter **release trunk** command to put it back to in-service. Retry the test command. If the test continues to abort, then escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the

NPE Crosstalk Test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 Tie Trunk Seizure Test (#136)	X	X	ND
Port Audit and Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes on the order of 20 to 30 seconds to complete.

Table 11-358. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-358. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. Refer to the TDM-BUS (TDM bus) Maintenance Documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. 1. Look for TTR-LEV errors in the error log. If present, refer to the TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at 1 minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-358. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run because of a previously existing error on the specific port or a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: 1281—Loss of signal, 1793—Blue Alarm, 2049—Red Alarm, 2305—Yellow Alarm, 1537—Hyperactivity. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-358. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	This can be due to on-board or off-board problems. Off-board problems of concern include EXP-PN and EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-PN and/or EXP-INTF errors in the error log. If present, refer to the EXP-PN Maintenance documentation and the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Retest when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Table 11-358. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

Conference Circuit Test (#7)

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-359. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-359. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. The **status health** command can be used to determine if the system is experiencing heavy traffic. Refer to the TDM-BUS (TDM bus) Maintenance Documentation to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. 1. Look for TTR-LEV errors in the error log. If present, refer to the TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the error log. If present, refer to the TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at 1 minute intervals for a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a user for a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-359. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	Test disabled via administration. This only applies to analog stations. 1. To enable test, set the Test field on the station administration screen for the particular analog station being tested to "y." Use the **change station <extension>** command.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or circuit pack, and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1 minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: 1281—Loss of signal, 1793—Blue Alarm, 2049—Red Alarm, 2305—Yellow Alarm, 1537—Hyperactivity. Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 11-359. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. 1. Enter the **list configuration board UUCSS** command. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281 entries. 2. Test all administered trunks on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. 3. If all of the ports fail, check the CARR-POW (see note below). 4. If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. 5. If the retry passes and troubles have been reported, coordinate isolation with the far-end PBX. Make sure that the near-end and far-end switches and any NTCE equipment (the CSU's) have the correct administration.

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Table 11-359. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(con't.)*	6. Replace the circuit pack. **NOTE:** If the conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Table 11-359. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack to ensure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of the trunk kept by the DS1 Interface circuit pack and the switch software.

Table 11-360. TEST #36 Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1006	ABORT	The test was aborted because the trunk is out of service. 1. Use the **status trunk** command to verify that the trunk is out of service. 2. If the trunk is out of service, determine why. 3. If it is OK to put the trunk back in service, issue the **release trunk** command to put the trunk back in service, and then retry the test. 4. If the test continues to abort, escalate the problem.

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Table 11-360. TEST #36 Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test does not run, but it does return PASS. To verify that the trunk is in-service: 1. Enter **status trunk** command to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release trunk** command to put trunk back into in-service. 3. Retry the test command.

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Table 11-360. TEST #36 Audit and Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

DS1 Tie Trunk Seizure Test (#136)

The DS1 Tie Trunk Seizure Test is run to verify the trunk's signaling capability. The test is composed of two parts. The first part queries the circuit pack for the following errors: Loss of Signal, Red Alarm, Blue Alarm, Yellow Alarm, and Hyperactivity Alarm. The second part of the test is performed by sending a seizure message to the DS1 Interface circuit pack and expecting an active reply by the DS1 Interface circuit pack. If maintenance software does not receive any reply and the timer expires, the test is aborted. Once the active message is received, a dial pause message is sent to the DS1 Interface circuit pack. If the DS1 Interface circuit pack replies with a dial pulse tone message when the far end responds to the seizure, then the DS1 tie trunk Seizure Test passes. If the far end does not respond to the seizure and the timer expires, and the DS1 Interface circuit pack sends a reorder message back to the maintenance software, then the test fails.

This second part of this test **CANNOT** be run on a trunk if one of the following cases is true:

1. The trunk direction is administered as an incoming only trunk.
2. The trunk is the 24th port on a DS1 Interface circuit pack which is administered using 24th Common Channel Signaling.
3. The trunk has been seized by a normal trunk call.
4. The trunk is administered with maintenance test disabled.
5. The outgoing signal type of the trunk is either automatic or immediate-start.

Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active but the port is not in use (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1004	ABORT	Far end is seizing the trunk while the test is ongoing. A glare situation is detected. Current test is designed to be aborted. Use the **display port UUCSSpp** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is idle, retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	Test failed due to incompatible configuration administered in trunk group form. 1. Verify the following fields on the trunk group administration screen: a. Is trunk direction incoming only? b. Is trunk outgoing type either automatic or immediate-start? c. Is trunk the 24th port of the DS1 Interface circuit pack while common control channel signaling is specified? 2. If the trunk has been administered using the above information, then this test should abort.
1018	ABORT	The test was disabled via translation. You may want to determine why the test has been disabled before you enable it. 1. Verify that the 'Maintenance Test' field on the 'Trunk Administration' screen is set to 'n.' To enable the test, change the trunk administration and enter 'y' into the 'Maintenance Test' field. 2. Repeat the test.
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general circuit pack error. 1. Examine the error log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error. 2. Retry the test. 3. If the test continues to abort, escalate the problem.
1040	ABORT	This test is not performed for trunk ports administered as access endpoints. 1. Verify this port is an access endpoint by using the **display port** command. 2. If the port has been administered as an access endpoint, this test should abort.

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Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one-minute intervals for a maximum of five times. 2. If the test continues to abort, escalate the problem.
2053	ABORT/ FAIL(1)	At least one of the following errors is found on the circuit pack: 1281: Loss of Signal, 1793: Blue Alarm, 2049: Red Alarm, 2305: Yellow Alarm, 1537: Hyperactivity. 1. Look for the above error types in the Hardware Error Log and follow the procedures given in the DS1-BD tests for the listed error types.

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Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The far-end trunk did not respond to the seizure of the near-end trunk within the allowable time period. This test could have associated in-line errors in the error log. 1. 1) Enter the **list configuration board UUCSS** command. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 136 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports will be taken out of service and extraneous on-board alarms will be generated. Replace the circuit pack with a TN767C V3 or later. 2. Verify that the 'Trunk Type' field on the 'Trunk Administration' screen matches the trunk type administered on far-end switch. 3. Look for DS1-BD or UDS1-BD errors in the hardware error log. If present, refer to the DS1-BD (DS1 trunk circuit pack) Maintenance documentation or to the UDS1-BD (UDS1 trunk circuit pack) Maintenance documentation. 4. Retry the test at 1 minute intervals for a maximum of 5 times. 5. If the test continues to fail, escalate the problem.

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Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	FAIL	Response to the seizure message was not received within the allowable time period. 1. Enter the **list configuration board UUCSS** command. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 136 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports will be taken out of service and extraneous on-board alarms will be generated. Replace the circuit pack with a TN767C V3 or later. 2. Verify that the 'Trunk Type' field on the 'Trunk Administration' screen matches the trunk type administered on far-end switch. 3. Look for DS1-BD or UDS1-BD errors in the hardware error log. If present, refer to the DS1-BD (DS1 trunk circuit pack) Maintenance documentation or to the UDS1-BD (UDS1 trunk circuit pack) Maintenance documentation. 4. Retry the test at 1 minute intervals for a maximum of 5 times. 5. If the test continues to fail, escalate the problem.
	PASS	The trunk can be seized for an outgoing call.

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Table 11-361. TEST #136 DS1 Tie Trunk Seizure Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. 2. If the board was found to be correctly inserted in step 1, issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

(1) Earlier G1 Software Versions reported Error Code 2053 as a FAIL

TIE-TRK (Tie Trunk)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
TIE-TRK[2]	MAJOR[3]	test port PCSSpp l	Tie Trunk
TIE-TRK	MINOR	test port PCSSpp l	Tie Trunk
TIE-TRK	WARNING	test port PCSSpp sh	Tie Trunk

1 Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02, ..., etc.); and pp is the 2-digit port number (for example, 01).

2 Not relevant to the TN497 circuit pack.

3 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed. (This is not relevant to the TN497 circuit pack.

NOTE:
If ATMS testing is enabled, check the error log for ATMS Errors #3840 and #3841. If the error log indicates that measurements exceeded acceptable thresholds, and if no other trouble is found with the **test trunk** command, run the ATMS test call with the **test analog-testcall port PCCSSpp full** command.

The following circuit packs are covered by this section of TIE-TRK (Tie Trunk):

- TN760 series
- TN437 [G3iV2-386]
- TN439 [G3iV2-386]
- TN458 [G3iV2-386]
- TN497 [G3iV2-386]
- TN2140 [G3iV2-386]

The Tie Trunk circuit pack fits into a port slot and contains four trunk circuits (see Figure 11-101). Each of these circuits interface a digital PBX to an analog tie trunk going to another PBX across one-way dedicated circuits (except for the TN497 circuit pack) or across two-way dedicated circuits. Except for the TN439 and TN497 circuit packs, each tie trunk has a 4-wire audio connection and may have two signaling leads (E and M). Each tie trunk for the TN439 and TN497 circuit packs has 2-wire audio connection/signal leads (A and B).

In G3iV1.1-286 or G3iV2-386, a tie trunk port can also be administered as an access endpoint, which is a non-signaling channel with a voice-grade data bandwidth.

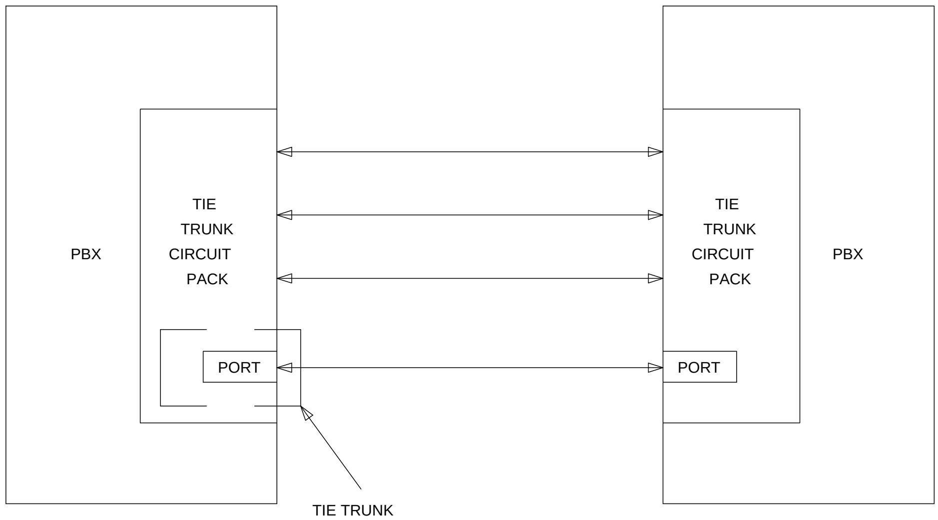

Figure 11-101. Tie Trunk Interactions

The number of tests to be implemented for Tie Trunk maintenance depends upon the TIE-TRK circuit packs involved. The test are as follows:

1. NPE Crosstalk Test—Verifies the switch connection operation of the circuit pack. It verifies that the trunk circuitry talks only on the selected time slot on the TDM Bus and that it never crosses over to time slots reserved for other connections.
2. Loop Around and Conference Circuit Test—Verifies the transmission operation of the circuit pack. It verifies that signals are transmitted to and from each port (Loop Around within the port), and it tests the conference capabilities of all ports.

   This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from trunk administration test field.
3. Several seizure tests, including the following:
   - Tie Trunk Seizure Test (not relevant to the TN439 and TN497 circuit packs)—Verifies the seizure capabilities of the circuit pack. For wink start and delay dial outgoing trunks only, (and, for the TN2140

[G3iV2-386] circuit pack, also for continuous-seize-ack and discontinuous-seize-ack), this test activates the M lead and checks for a response from the distant end within 10 seconds. For G3iV1.1-286 or G3iV2-386, this test ABORTS on trunk ports administered as access endpoints.

— Seizure Test (for TN497 circuit packs only)—Verifies the seizure capabilities of the circuit pack. This test seizes the trunk and outpulses a "pause." The port reports the result of the seizure attempt uplink. The test can be disabled via Trunk Group Administration.

— Tie Trunk Dial Test (for TN439 circuit packs only)—Verifies the seizure and dialing capabilities of the circuit pack. **This test ABORTS on trunk ports administered as access endpoints.**

4. EPF, M, and E Lead Test [G3iV1.1-286 and G3iV2-386 only]—ABORTS on trunk ports administered as access endpoints. This test consists of two parts:

   - E lead test—Checks for the proper activation and deactivation of the port's E lead.
   - M lead test—Checks the M lead EPF current flow. The results of this test allow for distinguishing between circuit pack and external facility failures.

5. Port Audit Update Test (Audit & Update Test for the TN497 circuit pack)—Sends non-disruptive administrative updates to the circuit pack with no expected response. The test updates the translation information on individual ports of the Tie Trunk. Except for the TN497 circuit pack, these updates include:

   - Immediate, automatic, wink start, or delay dial and for the TN2140 [G3iV2-386], continuous-seize-ack
   - For the TN2140 [G3iV2-386], continuous or discontinuous.
   - Rotary or DTMF senderization in or out
   - Disconnect timing
   - DMTF time slot

Additional in-line testing is performed while a call is in progress. Thus, many in-line errors may occur during operation. See the Error Log table for a description of these errors. These errors may be reproduced by using the trunk (making a call), and checking their occurrence in the Hardware Error Log.

Before a maintenance test can be run on a port, the port is required to be idle. Except for a TN497 circuit pack, if an incoming call seizes the port which is being tested by maintenance, the test is aborted, and the incoming call proceeds.

Non-TN497 circuit packs can be configured for back-to-back testing (also known as connectivity testing) by making translation and cross-connect changes. This testing configuration allows for the connection of Tie Trunks back-to-back in the same switch to verify the operation of Tie Trunk ports. The tests can be performed in either the E&M or simplex modes. For details, refer to the "Analog Tie Trunk Back-to-Back Testing" section in Chapter 5, "Routine Maintenance Procedures"

Hardware Error Log Entries and Test to Clear Values

Table 11-362. TIE Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSSpp s r 1
1 (a)[2]	16384[2]	None[2]	WARNING[2]	OFF[2]	
1 (b)[2]	57476[2]	None[2]	WARNING[2]	OFF[2]	
1 (c)[2]	57477[2]	None[2]	WARNING[2]	OFF[2]	
1 (d)[3]	57483[3]	None[3]	WARNING[3]	OFF[3]	
1 (e)[2]	57485[2]	None[2]	WARNING[2]	OFF[2]	
15 (f)	Any	Port Audit Update (#36); Audit and Update (#36)			
18 (g)	0	busyout trunk <grp/mbr>	WARNING	OFF	release trunk <grp/mbr>
130 (h)[2]		None[2]	WARNING[4]	ON[4]	test trunk <grp>/<mbr>[4]
257 (i)	57473	None	WARNING	OFF	
257 (j)	57474	None	WARNING	OFF	
257 (k)	57475	None	WARNING	OFF	
513[4]	Any[4]	EPF M and E Lead (#74)[4]	MAJ/MIN/ WRN[1,4]	OFF[4]	test port PCSSpp sh r 3[4]
769[4]	57481[4]	EPF M and E Lead (#74)[4]	MAJ/MIN/ WRN[1,4]	ON[4]	test port PCSSpp sh r 3[4]
1025 (l)	Any[2] 57392[5]	None	MAJ/MIN/ WRN[1,2] MINOR[5]	OFF	
1281[4]	Any [4]	EPF M and E Lead (#74)[4]	MAJ/MIN/ WRN[1,4]	ON[4]	test port PCSSpp sh r 3[4]
1537		Loop Around and Conference (#33)	MAJ/MIN/ WRN[1,4]; MINOR[6]	ON	test port PCSSpp l r 3

Continued on next page

Table 11-362. TIE Trunk Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1793		Tie Trunk Seizure (#73)[4]; Seizure (#73)[5]; Tie Trunk Dial (#747)[3]	MAJ/MIN/ WRN[4,6]; MINOR	OFF	test port PCSSpp sh r 2[4]; test port PCSSpp s r 2[6]
2049		NPE Crosstalk (#6)	MAJ/MIN/ WRN[1],[4]; MINOR[6]	ON	test port PCSSpp l r 3[2]
2305 (m)	50944	None[4]; Seizure (#73)[5]; Tie Trunk Dial (#747)[3]			
2305 (m)[3]	57424[3]	Tie Trunk Dial (#747)[3]			
2561[5]	0[5]	None[5]v	WARNING[5]	OFF[5]	
2817[5]	0[5]	None[5]	MINOR[5]	OFF[5]	
3073[5]	0[5]	None[5]			
3840 (n)	8000	Analog Transmission (#844-848)		OFF	
3841 (n)		Analog Transmission (#844-848)	MINOR	OFF	test analog testcall PCSS pp r 2

1 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command. If the MINOR alarm is not downgraded by the **set options** values, the MINOR alarm is upgraded to a MAJOR alarm if 75 percent of the trunks in this trunk group are alarmed.

2 Non-TN497 circuit packs only.

3 TN439 circuit packs only.

4 Non-TN439 and non-TN497 circuit packs only

5 TN497 circuit packs only.

6 TN439 and TN497 circuit packs only.

Notes:

a. Digit time-out. This occurs when the far-end PBX begins transmitting digits too late (10 seconds) after receiving the signal indicating ready to receive digits (if any). This can occur on an incoming immediate, wink, or delay dial line. Check the far-end PBX to ensure a translation match at both ends.

b. Rotary dial before wink. This occurs when the far-end PBX starts dialing before the PBX sends the wink on a wink-start or (for non-TN439 circuit packs) on a delay-dial line. Check the far-end PBX to ensure a translation match at both ends.

c. Rotary dial too early. This occurs when the far-end PBX starts dialing too soon (about 50ms) after seizure on a wink start or (for non-TN439 circuit packs) on a delay-dial line. Check the far-end PBX to ensure a translation match at both ends.

d. On hook before wink. This occurs when the far end goes on hook before a wink. Check the far-end PBX to ensure a translation match at both ends.

e. On an outgoing wink-start or delay-dial trunk, the wink time was too short (less than 80ms) for a valid signal. Check the far-end PBX to ensure a translation match at both ends.

f. This is a software audit error that does not indicate any hardware malfunction. Run the Short Test Sequence and investigate associated errors (if any).

g. This indicates that the trunk in question has been busied-out by maintenance personnel.

h. This indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

i. The rotary dial rate was too slow (less than eight pulses per second.) Check the far-end PBX to ensure a translation match at both ends.

j. The rotary dial rate was too fast (more than 12 pulses per second.) Check the far-end PBX to ensure a translation match at both ends.

k. The time between digits was too short (less than 300ms). Check the far-end PBX to ensure a translation match at both ends.

l. This indicates that the trunk is still seized with an incoming call. The far-end PBX is not releasing the trunk after the call is dropped. A Minor alarm is generated every four minutes until the far-end PBX releases the trunk. Check the far-end PBX for problems.

   Once the trunk is released from the call, the severity of this problem is decreased. If Error Type 1025 does not appear again, this means that the problem has been corrected. Verify that Error Type 1025 does not reappear in the Error Log.

m. Reorder message. Trunk could not be seized. This error causes the Tie Trunk Seizure Test (#73) to run, and it is considered a problem only if the Seizure Test fails (in which case Error Type 1793 also shows up). In this case, the trunk may be placed in the "Ready-for-Service" state (shown as "disconnected" by the status command), which allows only incoming calls. Run the Tie Trunk Seizure Test and follow its outlined procedures.

n. Test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements that were outside the acceptable limits. Use the **list testcall detail** command to examine specific transmission parameters that are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, the limits administered on the "change trunk" screen should be changed.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Loop Around and Conference Circuit Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Loop Around and Conference Circuit Test (#33)		X	ND
Tie Trunk Seizure Test (#73)([2]), Tie Trunk Dial Test (#747)([3]), Seizure Test (#73)([4])	X	X	ND
Tie Trunk EPF Test (#74)([5])	X	X	ND
Port Audit and Update Test (#36)([6]), Audit and Update Test (#36)([4])	X	X	ND
Analog Transmission Test (#844-848)	(a)	(a)	

1 D = Destructive; ND = Nondestructive
2 Non-TN439 and non-TN497 circuit packs only
3 TN439 circuit pack only
4 TN497 circuit pack only
5 G3iV1.1-286 and G3iV2-386 only
6 Non-TN497 circuit packs only

Notes:

a. ATMS test are not part of either sequence. They are run either on demand with the **test analog-testcall** command or via the ATMS schedule.

NPE Crosstalk Test (#6)

One or more NPE reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence and takes 20 to 30 seconds to complete.

Table 11-363. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use the **display trunk xx** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is active, but the port is not in use (no connected ports), check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.

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Table 11-363. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1001	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance to diagnose any active TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	(Non-TN497 circuit packs only) The port was seized by a valid call during the test. The test has been aborted. Use the **display trunk xx** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting.

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Table 11-363. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-INTF faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear all off-board problems before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. 1. Look for EXP-INTF errors in the error log. If present, refer to the EXP-INTF Maintenance documentation. 2. Look for TDM-BUS errors in the error log. If present, refer to the TDM-BUS Maintenance documentation. 3. Look for TONE-BD and/or TONE-PT errors in the error log. If present, refer to the TONE-BD Maintenance documentation and the TONE-PT Maintenance documentation. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.

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Table 11-363. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Loop Around and Conference Circuit Test (#33)

This test checks the reflective loop around, and conference capabilities of a tie trunk port circuit. The test uses 404-Hz, 1004-Hz, and 2804-Hz tones. This is an on-board test only, and each tone is transmitted through the loop and checked upon return.

This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from the trunk administration Test field.

Table 11-364. TEST #33 Loop Around and Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
7	ABORT	The conference circuit test was aborted. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
129	ABORT	The 404-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
131		The 1004-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
133		The 2804-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-364. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use the **display trunk xx** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is active, but the port is not in use (no calls), check the Error Log for Error Type 1025 (see Error Log table for a description of this error and required actions). The port may be locked up. 2. If the port status is idle, retry the command at one-minute intervals a maximum of five times. 3. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-364. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the command at one-minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	(Non-TN497 circuit packs only.) The port was seized by a valid call during the test. The test has been aborted. Use the **display trunk xx** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting.
1018	ABORT	The test has been disabled via administration. Verify that the 'Maintenance Test' field on the 'Trunk Group' form is set to 'n'. To enable the test, issue the 'change trunk-group x' command (x equals the number of the trunk group to be tested). Then, change the entry in the 'Maintenance Test' field on the form to 'y'.

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Table 11-364. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
7,	FAIL	The conference capabilities of the port failed (Error Code 7).
129,		The reflective 404-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 129).
131, or		The reflective 1004-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 131).
133		The reflective 2804-Hz Tone Test failed. No transmission was detected to or from the port (Error Code 133). FAULT ISOLATION: Proceed as follows unless power or tone problems are suspected (see notes on the next page). 1. To make sure the problem is on-board, disconnect the port from the CO and retry the test. Coordinate this with the CO, or do it after busy hours; otherwise, the CO may put the connection out of service. 2. If the retry fails, replace the circuit pack. 3. If the retry passes and no troubles have been reported, disable the test. If the retry passes and troubles have been reported, refer the problem to the CO. *More information continues on the next page.*

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Table 11-364. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
7, 129, 131, or 133 *(cont'd.)*	FAIL *(cont'd.)*	**NOTE:** If the loop around and conference circuit test fails for all ports on a circuit pack, a -5 volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC power unit, refer to the CARR-POW (carrier port power unit for AC-powered systems) Maintenance documentation. To investigate problems with a 645B DC power unit, refer to the CARR-POW (carrier port power unit for DC-powered systems) Maintenance documentation. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test. If the test fails again, see FAULT ISOLATION above.
	PASS	Tie trunk Loop Around and Conference Test is successful. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port.

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Table 11-364. TEST #33 Loop Around and Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Audit Update Test (#36)

This test sends updates of the Tie Trunk port translation for all ports on the circuit pack that have been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the board. No response message is expected from the circuit pack once it receives translation updates. The port translation data for non-TN439 and non-TN497 circuit packs includes the following: Immediate, automatic, wink-start or delay dial trunk, rotary or DTMF senderization in or out, disconnect timing from 10 to 2550ms in 10ms increments, and DMTF time slot. (Continuous-seize-ack is also included for the TN2140 [G3iV2-386] circuit pack.) The port translation data for the TN439 circuit pack includes the following: Immediate or wink-start trunk, rotary or DTMF senderization in or out, disconnect timing from 10 to 2550ms in 10ms increments, and DMTF time slot.

Table 11-365. TEST #36 Audit Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1006	ABORT	(TN439 and TN497 circuit packs only.) The port is in the out-of-service state. The test cannot be run. 1. Retry the command once the port is in service.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If test continues to fail, escalate the problem.
	FAIL	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.

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Table 11-365. TEST #36 Audit Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	This test passed. Translation information was successfully updated on the circuit pack. 1. If signaling troubles are reported, verify translation information for this port. (Non-TN439 and non-TN497 circuit packs only.) If the trunk is busied out, the test does not run, but it does return PASS. To verify that the trunk is in-service: 1. Enter **status trunk** command to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. 2. Enter **release trunk** command to put trunk back into in-service. 3. Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Tie Trunk Seizure Test (#73), Tie Trunk Dial Test (#747). Seizure Test(#73)

The Tie Trunk Seizure Test activates the M lead and checks for a response from the external end within 10 seconds. This test is applicable only to wink start and delay dial outgoing trunks. (For the TN2140 [G3iV2-386] circuit pack, the trunk must also be continuous-seize-ack and discontinuous-seize-ack).

The Tie Trunk Dial Test seizes the trunk and outpulses a pause digit.

For a port administered as TGU or a TGE, the Seizure Test internally seizes the trunk and outpulses a "pause." The report reports the result of the seizure attempt uplink.

Table 11-366. Seizure Tests (#73, #747, #73)

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use the **display trunk xx** to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active, but the port is not in use (no calls), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. The far-end PBX may not be releasing. 2. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-366. Seizure Tests (#73, #747, #73) — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	(Non-TN497 circuit packs only.) The port was seized by a valid call during the test. The test has been aborted. Use the **display trunk xx** to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1005	ABORT	(Non-TN439 circuit packs only.) This test is not valid for this trunk translation. For this test to run, a delay dial trunk (or, for non-TN497 circuit packs, a wink-start trunk) must be in effect, and the trunk must be outgoing or two-way. Also, for the TN2140 [G3iV2-386], the trunk must be continuous-seize-ack or discontinuous-seize-ack. 1. Check trunk translation. If it is not a wink-start or delay dial trunk, this abort message should be ignored. (For the TN2140 [G3iV2-386], disregard this abort on a trunk that is not continuous-seize-ack or discontinuous-seize-ack.)
1018	ABORT	Test disabled via administration. 1. Verify that the "Maintenance Tests?" field on the Trunk Group Form is set to "n." To enable the test, issue the **change trunk-group x** command where "x" equals the number of the trunk group to be tested. Then change the entry in the "Maintenance Tests?" field on the form to "y."

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Table 11-366. Seizure Tests (#73, #747, #73) — *Continued*

Error Code	Test Result	Description/ Recommendation
1040	ABORT	(Non-TN497 circuit packs only.) This test is not performed for trunk ports administered as access endpoints. 1. Verify this port is an access endpoint by using the **display port** command. 2. If the port has been administered as an access endpoint, this test should abort.
2000	ABORT	Seizure message is not received back within 10 seconds. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. 3. Check the facility.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
3	FAIL	(TN439 circuit packs only.) No dial tone detected from the other end. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. 3. Check the facility.
	PASS	The relevant seizure test passes. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port, wiring, and stations.

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Table 11-366. Seizure Tests (#73, #747, #73) — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Tie Trunk EPF Test (#74)

This test consists of an E lead and M lead test. The E lead test checks for the proper activation and deactivation of the port's E lead. The M lead test checks the M lead EPF current flow. The processor sends an M lead test request to the circuit pack and receives the results. The returned results are measured to see if a port or external tie trunk line fails.

Table 11-367. TEST #74 Tie Trunk EPF Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	ABORT	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use the **display trunk xx** to determine trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. 1. If the port status is active, but the port is not in use (no calls), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. The far-end PBX may not be releasing. 2. If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.

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Table 11-367. TEST #74 Tie Trunk EPF Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display trunk xx** to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, and the port is not in use, escalate the problem.
1005	ABORT	This test is not valid for this trunk translation. Must be a Type-1 standard trunk for this test to run. 1. Check trunk configuration. If it is not a Type-1 standard trunk, this abort message should be ignored.
1014	ABORT	The test was aborted because the circuit pack has not been inserted into the system. 1. Use the **list configuration board** command to make sure the circuit pack is inserted in the carrier. 2. If the board is not inserted, make sure the circuit pack is inserted in the carrier and fully seated. 3. If the test continues to fail, escalate problem.
1040	ABORT	This test is not performed for trunk ports administered as "access endpoints." 1. Verify this port is an access endpoint by using the **display port** command. 2. If the port has been administered as an access endpoint, this test should abort.

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Table 11-367. TEST #74 Tie Trunk EPF Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The E lead test failed due to an on-board port problem. 1. Replace the circuit pack.
2	FAIL	The M lead test failed. The EPF has experienced an overcurrent condition, perhaps due to the external M lead. 1. To make sure the problem is on-board, disconnect the facility from the pack and retry the test. 2. If the test fails, replace the circuit pack. Otherwise, check the external wiring toward the far-end PBX.
	PASS	Tie Trunk EPF test is successful. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port.
0	NO BOARD	The test could not relate the internal ID to the port (no board). 1. Check to ensure that the board translations are correct. Translate the board, if necessary. 2. Issue the **busyout board** command. 3. Issue the **reset board** command. 4. Issue the **release busy board** command. 5. Issue the **test board** command. This should re-establish the linkage between the internal ID and the port.

Transmission Test (#844-848)

This test is non-destructive.

NOTE:
Tests #844-848 are not supported on a International switch.

These tests are run by the Automatic Transmission Measurement System (ATMS). They are not part of the long or short trunk test sequences. Instead, they are run on demand with the **test analog-testcall** command or as part of ATMS scheduled testing.

The test call is run from an analog port on a TN771 Maintenance/Test circuit pack. It attempts to seize a port and make a call to a terminating test line (TTL) on the trunk's far end. Transmission performance measurements are made and compared to administered thresholds. Errors are generated when results fall outside of ''marginal'' or ''unacceptable'' thresholds. Detail and summary measurement reports are obtainable via the **list testcalls** command.

Table 11-368. TEST #844-848 Transmission Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port PCSSpp** to determine the trunk group/member number of the port. Use the "status trunk" command to determine the service state of the port. If the service state indicates that the port is in use, then the port unavailable for this test. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. If the port status is idle, then retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.

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Table 11-368. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM bus errors. Refer to TDM Bus Maintenance to diagnose any active TDM bus errors. 1. If system has no TDM bus errors and is not handling heavy traffic, repeat test at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use status trunk to determine when the port is available for testing. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	Trunk has been administered as incoming-only; transmission tests can only be run on outgoing trunks.
1115	ABORT	The near end test line on the TN771 circuit pack could not be allocated. 1. Verify that the TN771 circuit pack is in service and that port 1 is administered and in service with the **status port** command. 2. retry the command at 1 minute intervals for a maximum of 5 retries. 3. If the test continues to abort escalate the problem.
1900	ABORT	The test completion message was not received from the TN771 circuit pack. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.

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Table 11-368. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1901	ABORT	This error occurs when the TN771 circuit pack uplinks a message that is not the proper response for this test. The anticipated uplink messages are seize, ring or answer. 1. Verify that the Trunk is administered properly. 2. If the test continues to abort, escalate the problem.
1905	ABORT	Intercept tone detected from far end. 1. Get the test line data from theand verify it with the far end. Dial the test number manually to see if the TTL is reached. If it is not, then either the number is wrong, or the far end is administered incorrectly. 2. If the test continues to abort escalate the problem.
1906	ABORT	Reorder tone detected from far end. 1. See actions for error code 1905.
1907	ABORT	Other unexpected tone detected from far end. 1. See actions for error code 1905.
1913	ABORT	Audible Ring detected from far end. 1. See actions for error code 1905.
1914	ABORT	Unidentified interrupted tone detected from far end. 1. See actions for error code 1905
1915	ABORT	Busy tone detected from far end. 1. Since the test line at the far end was busy. Try the test again. 2. If the test continues to abort, the problem is with the far end system.
1918	ABORT	Test progress tone not removed from far end (type 105 test line only). 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).

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Table 11-368. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1919	ABORT	Unexpected far end release 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1920	ABORT	No response from far end. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1921	ABORT	No data returned from far end. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).
1922	ABORT	Steady, unidentifiable tone from far end 1. See actions for error code 1905.
1923	ABORT	Broadband energy detected from far end (such as voice or announcement). 1. See actions for error code 1905.
1924	ABORT	No test tone from far end 1. See actions for error code 1905.
1938	ABORT	Near-end self test failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1939	ABORT	Loss self check at 0dBm at 1004 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1940	ABORT	Far end noise self check failed. 1. The problem is with the far end system; a technician at the far end should test the test line (TN771 or ADFTC).

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Table 11-368. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1941	ABORT	High frequency singing return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1942	ABORT	Echo return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1943	ABORT	Singing return loss self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1944	ABORT	Loss self check at -16 dBm at 1004 Hz failed. 1. Test the TN771 circuit packs 2. If the test continues to abort escalate the problem.
1945	ABORT	Loss self check at -16 dBm at 404 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1946	ABORT	Loss self check at -16 dBm at 2804 Hz failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
1947	ABORT	Noise with tone self check failed. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
2000	ABORT	The test timed out while waiting for a response from the TN771 circuit pack. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.

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Table 11-368. TEST #844-848 Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2012	ABORT	An internal software error occurred. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
2053	ABORT	The test call could not be established, but no information on why is available. 1. Retry the command at 1 minute intervals for a maximum of 5 retries. 2. If the test continues to abort escalate the problem.
2056	ABORT	An error occurred while trying to obtain results from the TN771 circuit pack. 1. Test the TN771 circuit packs. 2. If the test continues to abort escalate the problem.
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group form. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the trunk group form. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
8000	FAIL	Measured transmission performance was in the marginal range as administered on the trunk group form. This generally means that the trunk is usable but has an undesirable amount of noise or loss. If the user does not report unacceptable effects, it may not be necessary to take any action. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the trunk group form.

TONE-BD (Tone-Clock Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run[1]	Full Name of MO
	MAJOR	test tone-clock PC	Tone-Clock Circuit Pack
TONE-BD	MINOR	test tone-clock PC	Tone-Clock Circuit Pack
TONE-BD	WARNING	release tone-clock PC	Tone-Clock Circuit Pack

1 P is the port network number (1 for PPN, 2-3 for EPNs). C is the carrier designation (A, B, C, D, or E).

The Tone-Clock circuit pack functionality is provided by two independent objects in the same circuit pack. The tone generator provides all the tones needed by the system and the clock generates the system clocks for the Time Division Multiplex (TDM) Bus and aids in monitoring and selecting internal synchronization references.

When resolving errors/alarms on the Tone-Clock circuit pack, the following should be used also:

- TONE-PT (Tone Generator) Maintenance documentation.
- TDM-CLK (TDM Bus Clock) Maintenance documentation.
- SYNC (Synchronization) Maintenance documentation.

The TN2182 is a combined Tone-Clock-Detector circuit pack which contains a third independent function not available on the TN768 or TN780. The TN2182 contains 8 ports used for all-purpose tone detection. These ports are called Enhanced Tone Receiver ports (ETR-PT) and are described in the documentation for ETR-PT.

Tone-Clock Circuit Packs and System Reliability Options

The following sections describe the relationship between the various System Reliability Options and Tone-Clock circuit pack configurations.

Standard Reliability Option

Systems with the Standard Reliability Option (no duplication options) have one Tone-Clock circuit pack in each port network (PPN and EPN). For the PPN or the EPN this is in the A carrier. This Tone-Clock circuit pack generates clocks and provides system tones for all carriers of the port network it resides on.

High Reliability Option

Systems with the High Reliability Option (duplicated SPE, simplex PNC) have one Tone-Clock circuit pack in each PPN control carrier, A and B. One Tone-Clock circuit pack will be actively generating system clock signals for PPN components, while the other will be in standby mode, ready to take over in the event of a Tone-Clock interchange. Similarly, one Tone-Clock circuit pack will be actively providing system tones for the PPN, while the other will be in standby mode. Normally, the same Tone-Clock circuit pack will be active for both tones and clock signals, but these responsibilities may be divided if neither circuit pack is able to perform both functions. The **status port-network** command will indicate which Tone-Clock circuit pack is actively performing each function.

For systems using the TN2182 Tone-Clock-Detector circuit pack, tone generation and clock generation behaves the same as other clock boards with one being active and one being standby. But the tone detector ports (ETR-PTs) of the TN2182 are always considered available and in-service regardless of the active/standby state of the tones or clock for a specific circuit pack.

EPN Tone-Clock circuit pack configuration is the same as for the Standard Reliability Option. Each EPN Tone-Clock circuit pack will be active for both tones and clock signals for its port network.

Critical Reliability Option

Systems with the Critical Reliability Option (SPE duplication and PNC duplication) have two Tone-Clock circuit packs associated with the PPN, as in the High Reliability Option case, and two more Tone-Clock circuit packs for each EPN. For the EPN, these are in carriers A and B. As in the previous case, one Tone-Clock in each Port Network is active, supplying system clocks and tones, and the other is in standby mode.

Tone-Clock Interchange Strategy

The Tone-Clock circuit pack interchanges are controlled both by manual intervention and by maintenance software strategies.

The manual interchange strategy for Tone-Clock circuit packs differs slightly between the PPN and any EPNs on a system.

Manual PPN Tone-Clock Interchange

In a PPN with more than one Tone-Clock circuit pack, the intention is to assure that the one considered most healthy is active at any given time. *This is independent of the SPE Duplication strategy*, in the sense that the active Tone-Clock circuit pack need not change with an interchange of SPE carriers. Rather, except for the effect of the manual intervention discussed earlier, Tone-Clock interchanges occur only as a result of changes in the health of Tone-Clock circuit packs, as perceived by maintenance software. When both Tone-Clock circuit packs are equally healthy, no preference is given to one over the other, regardless of which SPE carrier is active.

It is possible to manually control Tone-Clock interchanges in three ways.

1. The **standby** Tone-Clock circuit pack may be made unavailable for most purposes by using the **busyout tone-clock PC** command. Such a Tone-Clock may not be selected with console commands, nor with normal maintenance software activities, until it has been made available again with the **restore tone-clock PC** command.

   NOTE:
   busyout tone-clock is not allowed for active Tone-Clock circuit packs.

2. The SPE processor lock switches may be used to force a particular SPE to be active. *This method overrides all other Tone-Clock interchange controls*. If there is a Tone-Clock circuit pack in the same carrier as the active SPE, it will become active, regardless of its health. If the Tone-Clock circuit pack in the selected SPE was in the *busyout* state (see item 1 above), it will automatically be released and made active. While the lock switches are set for a particular carrier, *no manual intervention or software error detection* will cause an interchange of Tone-Clocks; the Tone-Clock circuit pack in the standby SPE carrier can never become active. If there is no Tone-Clock circuit pack in the selected SPE at the time the switches are set, but one is later installed, the system will interchange to it regardless of its health. If the Tone-Clock circuit pack is removed from an SPE while the switches are set, *no interchange will occur*; the system will have no active tone-clock. When the lock switches are restored to the neutral position, a tone clock interchange will occur only if the standby Tone-Clock circuit pack is healthier than the active one.

3. A particular Tone-Clock circuit pack can be made active by issuing the **set tone-clock PC [override]** command. If the Tone-Clock to be made active is less healthy than the currently active one, no interchange will occur unless the **override** option is specified; without it a message will inform the user that it is required.

   Once a Tone-Clock circuit pack is made active by the **set tone-clock PC** command, it will stay active until either the **set tone-clock PC** command is issued again to make the other circuit pack active, or until a fault occurs in the active Tone-Clock circuit pack, which causes the system to interchange Tone-Clocks.

Manual EPN Tone-Clock Interchange

In an EPN with duplicated Tone-Clock circuit packs, one circuit pack is always *preferred* over the other. This is the Tone-Clock circuit pack in carrier **A**. The intention is that the preferred circuit pack be active whenever it is healthy. Once a failing preferred Tone-Clock circuit pack has been replaced or repaired, the system will make it active as soon as possible.

Control over interchanges for an EPN is accomplished in essentially the same ways as items 1 and 3 in the PPN case above. In addition, when the non-preferred Tone-Clock circuit pack in an EPN is active, and the preferred circuit pack is repaired and proven capable of filling its roles, the system will automatically interchange back to it as soon as possible.

Software Maintenance Interchange

Interchanges may be instigated by software Tone-Clock maintenance in two ways.

1. A scheduled Tone-Clock circuit pack interchange occurs according to the parameters set by the **change system-parameters maintenance** command. This can be disabled or set to run weekly, but the standard (default) situation is for it to occur daily, at the time specified in the system-parameters list for scheduled maintenance to begin. This interchange will be blocked if the lock switches are set, if the non-preferred Tone-Clock circuit pack in an EPN has been selected with the **set tone-clock** command, if the standby Tone-Clock has been set to the busyout state, or if the clock generation capability of the standby Tone-Clock circuit pack is known to be impaired. When this scheduled interchange occurs, the standby Tone-Clock circuit pack becomes active for a period of 20 seconds to test its ability to generate clock signals, and then is returned to standby mode.
2. Unscheduled interchanges occur when on-board Tone-Clock circuit pack maintenance, or ongoing switch maintenance tests of **TONE-BD, TONE-PT**, or **TDM-CLK** uncover failures serious enough to raise any MAJOR or MINOR alarm against the active Tone-Clock circuit pack.

International Settings [G3i V2]

The TN780 Tone-Clock circuit pack uses three firmware configuration parameters for international support [G3i V2]. The following two are automatically set by the software load for the targeted country:

- The circuit pack’s country-code (USA, ITALY, AUSTRALIA, etc.)
- The circuit pack’s companding mode (mu-Law or A-Law)

The third configuration parameter is used only for Italy (country code: ITALY), and selects whether *new* versus *old* ISPT (Istituto Superiore Poste Telegrafi) tones will be used for dial and confirmation tones. Values for dial confirmation tone can be set independently on the **change system-parameters miscellaneous** form. Whenever such changes are made, the effects are immediately enforced on all TN780 Tone-Clock circuit packs without disrupting tone or timing services.

Italian Tone Settings (New ISPT Value)

Tone	Default	Old ISPT Value
Dial	Continuous	Cadenced
Confirmation	Cadenced	Continuous

In addition the TN780 allows customization of up to six system tones in order to meet specific country needs. These changes are made via the **change system-parameters country-options** form.

The TN2182 allows the same International changes as the TN780 but allows the customization of up to 24 system tones in order to meet specific country needs. These changes are made via the **change system-parameters country-options** form.

How to Replace a Tone-Clock Circuit Pack

Replacing the Tone-Clock circuit pack is a service-disrupting procedure on Port Networks with a single Tone-Clock, because the Tone-Clock circuit pack is always needed to generate clocks for its network. For EPN Tone-Clock replacement where no second Tone-Clock circuit pack exists, only that EPN is affected. When the circuit pack is removed, all calls are dropped immediately, the EPN enters emergency transfer within one minute, and no calls can be set up from or to that EPN. However, if the PPN Tone-Clock is removed for replacement in a Standard Reliability Option system, the System Emergency Transfer feature is activated within milliseconds, and the entire system is disrupted; no calls can be placed, and existing calls are dropped.

When replacing the Tone-Clock circuit pack, always replace it with a comparable Tone-Clock circuit pack for the system. See the following table:

System Type	Tone-Clock Circuit Pack Code
One-port network single-carrier cabinet system without High or Critical Reliability.	TN756, TN768, TN780 TN2182 [G3iV4-386]

System Type	Tone-Clock Circuit Pack Code
One-port network system without High or Critical Reliability (multicarrier cabinet).	TN768, TN780
Two-port network single-carrier cabinet system without High or Critical Reliability.	TN768, TN780 TN2182 [G3iV4-386]
One- or two-port network without High or Critical Reliability.	TN768, TN780 TN2182 [G3iV4-386]

- **TN768**—This is the general purpose Tone-Clock circuit pack for port networks on a G3i switch. It can be used in every situation except as the Master Tone-Clock circuit pack when a Stratum 3 Clock is administered.
- **TN780**—The Stratum 3 Clock feature requires the use of this circuit pack code for the PPN (in both carriers of High and Critical Reliability systems). The Stratum 3 Clock will operate only with this code as the Master Tone-Clock circuit pack. The TN780 circuit pack is upward compatible with the TN768 code, and can be used in any place a TN768 would be allowed. The TN780 is used in many countries outside the U.S. where the TN768 does not provide local tones.
- **TN2182**—This Tone-Clock-Detector may be used anywhere a TN768 or TN780 is used with the exception of configurations requiring Stratum 3 Clock. The TN2182 may be used in all country configurations.

Port Networks with a Single Tone-Clock Circuit Pack

This procedure is destructive.

1. Pull out the defective Tone-Clock circuit pack. This will remove the clocks and cause the system to activate emergency measures:
   - For the PPN Tone-Clock, the system will immediately go into the Emergency Transfer state.
   - For an EPN Tone-Clock, all calls to and from the EPN will drop and the EPN will activate Emergency Transfer within about one minute, but the rest of the system should operate normally.
2. Insert a new Tone-Clock circuit pack. The system will detect the return of the clocks and will automatically recover as follows:
   - If the Tone-Clock circuit pack being replaced is in the Processor Port Network, the system will perform a **reset system 2 (system cold 2 restart)** automatically. First, all red LEDs of the PPN will come on and off wi thin 30 seconds. Then, all red LEDs of any Expansion Port Networks will come on and go off within the next 30 seconds.

- If the Tone-Clock circuit pack being replaced is in an Expansion Port Network, the system will reset the EPN **(EPN cold restart)** and all the red LEDs of the EPN will come on and go off within 30 seconds.

3. If the red LEDs come on but do not go off within 30 seconds, pull the circuit pack out and reseat it. If the LEDs perform as expected this time, continue with step 6. Otherwise, there may be a problem with the TDM Bus; possibly a bent pin in the Tone-Clock circuit pack slot. Follow the directions in the TDM-BUS maintenance section.
4. If the red LEDs did light, as explained above, then go to Step 6. If the red LEDs do NOT light, as explained above, then go on to Step 5.
5. Restart the affected Port Network:
   - In the PPN, restart the system via the **reset system 2** command.
   - In an EPN, restart the EPN by resetting its Expansion Interface circuit pack via the **reset board** command, using the board address 1a01 for EPN1 and 1a02 for EPN2.

   If this step should fail, follow normal escalation procedures.
6. Test the new Tone-Clock circuit pack to verify that it is functioning properly, using the **test tone-clock PC long** command, and verify that the system is operational by placing several phone calls. Where possible, try calls into, out from, and within the affected Port Network.

   If the system is not operating properly, follow normal escalation procedures.

Port Networks with Two Tone-Clock Circuit Packs:

1. If both Tone-Clock circuit packs in a Port Network need to be replaced, first replace and test the one that is in standby mode. Make sure that it is healthy and active before replacing the second one. Make sure the Tone-Clock circuit pack to be replaced is in Standby Mode by displaying its status via the **status port-network** command or making sure its yellow LED is off.

   The active/standby state of a Tone-Clock circuit pack may also be determined by looking at its LED. A continuously lit red LED on the Tone-Clock circuit pack indicates a reported fault on one or more of the maintenance objects on the circuit pack. Flashing patterns of the yellow and green LEDs correspond to the following service states: **Tone-Clock LED Flashing Codes**

Condition	Tone-Clock Circuit State	Explanation
"flashing yellow" 2.7 seconds on, .3 seconds off	active	An external timing source is being used as a synchronization reference.[1]
"flashing yellow" .3 seconds on, 2.7 seconds off	active	The local oscillator on the Tone-Clock circuit pack is being used as a synchronization reference.
"yellow" on continuously	active	The circuit pack has been reset but has not been told which synchronization source to use.
"yellow" LED off	standby	The circuit pack is in standby mode, (neither generating tones nor supplying clocks).
"jingle bells" green and yellow .1 sec on, .2 sec off, .1 sec on, .4 sec off, .4 sec on, .4 sec off	standby	Maintenance software is testing the standby circuit pack (the standby Tone-Clock is providing tones).
"double blink yellow" .3 sec on, .3 sec off, .3 sec on, 2.4 sec off	active	TN2182 has lost all external references and is in holdover mode.
"other green and yellow patterns"	active	Maintenance software is testing the active circuit pack.
random yellow	standby	If the circuit pack is a TN2182, the yellow LED may come on and off intermittently as ETR-PTs on the board are used for tone detection services.

1 For a Tone-Clock in the master port network, the external source is the primary or secondary DS1 source, or a Stratum 3 clock. For a Tone-Clzteock in a slave port network, the external source is the Expansion Interface circuit pack.

2. If the Tone-Clock circuit pack to be replaced is active, then switch to the other Tone-Clock circuit pack by doing the following:
   - **set tone-clock PC**—where PC is the Standby Tone-Clock circuit pack. Since the system is designed to operate primarily on the preferred tone clock, the set tone-clock PC command should be

used to make the preferred tone board active when maintenance activity is completed. There is no preferred tone clock for the PPN, but carrier A is preferred for EPNs.

- **status system**—verify the Tone-Clock circuit pack switched to the other Tone-Clock circuit pack or check the LEDs. The yellow LED of the new Standby Tone-Clock circuit pack should be off (provided maintenance is not running on it) and the yellow LED of the active Tone-Clock circuit pack should be blinking.
- If the interchange was not successful, the standby Tone-Clock circuit pack may be defective. In particular, if the error message "must use override" is displayed, fix the standby Tone-Clock circuit pack before attempting to replace the active one.

3. If the Tone-Clock circuit pack to be replaced is in the PPN, it is recommended, but not required, that the SPE carrier containing it be locked in standby mode by executing an interchange if necessary, and locking the SPE-Select switches. This protects you from disrupting service in case of inadvertent errors in replacing the circuit pack.

   NOTE:
   If the SPE-Select switches are locked, be sure to release them at the conclusion of the replacement procedure.

4. Pull out the defective Tone-Clock circuit pack. No calls should be affected. If this is a TN2182 circuit pack, some ETR-PTs may be in use and removal of the pack will affect some individual users. It may be less disruptive to busyout the standby TN2182 before removing it.
5. Insert a new Tone-Clock circuit pack of the appropriate code in the same slot where the defective Tone-Clock circuit pack was removed.
6. Test the new Tone-Clock circuit pack via the **test tone-clock PC** command to make sure it is functioning properly. If the Tone-Clock circuit pack is being replaced due to loss of clocks, the Clock Health Inquiry (#46) will still report a failure, proceed with the next step.
7. To verify that the new Tone-Clock circuit pack is able to generate clocks for the system, switch to the new Tone-Clock circuit pack via the **set tone-clock PC override** command, and execute **test tone-clock PC**. (In a PPN, the SPE-Select switches must be in the auto position.)

   CAUTION:
   If the new Tone-Clock circuit pack is not able to generate system clocks, this procedure becomes destructive. The system will detect a loss of clock and recover accordingly.

   In this case if the Tone-Clock circuit pack being replaced is in the PPN the system will perform a reset system 2 (cold 2 restart) automatically. If the Tone-Clock circuit pack being replaced is in an EPN, the system will reset the EPN (EPN cold restart). After either type of restart, the faulty

Tone-Clock circuit pack will be in standby mode. Since the replacement procedure was not successful, follow normal escalation procedures. **If the new Tone-Clock circuit pack is able to generate system clocks, there will be no system disruption.**

8. Place several phone calls.

9. After replacing a Tone-Clock circuit pack in an SPE, if the SPE lock switches were set during the procedure, they should be released. Additionally, after repairs in an EPN, the **set tone-clock PC** command should be used if required to make the preferred Tone-Clock circuit pack active.

Hardware Error Log Entries and Test to Clear Values

Tone-Clock Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tone-clock PC sh
1(a)	0	Circuit pack removed or SAKI Sanity Test (#53)	MINOR	ON	
18(b)	0	busyout tone-clock PC	WARNING	OFF	release tone-clock PC
23(c)	0	None	WARNING	OFF	
125(d)		None	MINOR	ON	
126(e)		None	MINOR	ON	
257	65535	Control Channel Test (#52)	MINOR	ON	test tone-clock PC r 20
257(f)	Any	None			
513(g)	Any	None			
769(h)	4358	None			
1025(i)	4363	NPE Audit Test (50)			test tone-clock PC sh
1538(j)	Any	None	MINOR	ON	
2049(k)	0	Clock Health Inquiry Test (#46)	MAJOR	ON	set tone-clock PC override
2305(k)	0	Clock Health Inquiry Test (#46)	MAJOR	ON	set tone-clock PC override
2561(l)	Any	None	MAJOR	ON	
3329(m)	0	None	MINOR/ WARNING[2]	OFF	set tone-clock PC
3840(n)	Any	None			
3848(o)	0	Clock Health Inquiry Test (#46)			set tone-clock PC override
3872(p)	0	None			set tone-clock PC override
3999 (q)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. Error Type 1—This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

> **NOTE:**
> The alarm is logged approximately 11 minutes after the circuit pack is removed/SAKI Sanity Test (#53) fails.

If the circuit pack is not present in the system, insert a circuit pack in the slot indicated by the error to resolve the error.

If the circuit pack is present in the system, it is faulty and must be replaced. See the preceding section, "How to Replace a Tone-Clock Circuit Pack".

If the faulty circuit pack is in standby mode, a MINOR alarm is raised, but no other system action is taken. If the circuit pack is the active Tone-Clock, further effects of this error depend on the Reliability Option for the switch.

Table 11-369. Effect of Error Type 1 on an Active Tone-Clock Circuit Pack

	Location of Tone-Clock Circuit Pack	
Reliability Option	**PPN**	**EPN**
Standard	System Emergency Transfer (entire system affected)	Emergency Transfer in the affected EPN
High	Interchange to standby Tone-Clock in the PPN	Emergency Transfer in the affected EPN
Critical	Interchange to standby Tone-Clock in the PPN	Interchange to standby Tone-Clock in the affected EPN

If an interchange is attempted and the system is unable to activate the standby Tone-Clock, Emergency Transfer is activated. If the problem is in the PPN the entire system is affected. Otherwise only the EPN in question is affected. When this happens, both circuit packs are faulty and must be replaced. See the preceding section, "How to Replace a Tone-Clock Circuit Pack".

If a successful interchange occurs in response to a failure of the active Tone-Clock, or if a standby Tone-Clock fails, the faulty Tone-Clock should be replaced.

b. Error Type 18—The indicated Tone-Clock circuit pack has been made unavailable via the **busyout tone-clock PC** command. This error applies only to High or Critical Reliability systems (an active Tone-Clock may not be busied out). To resolve this error, execute **release tone-clock PC**.

c. Error Type 23—The circuit pack has been logically administered but not physically installed. Installing the circuit pack will resolve the alarm.

d. Error Type 125—A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

e. Error Type 126—The port network specified in the PORT field of the error log entry booted up without a Tone-Clock circuit pack, or with a one that cannot communicate at all with the system. The error is logged five minutes after the port network is restarted. If no circuit pack is present, install one of the proper code. If there is a circuit pack present, replace it. See the preceding section, "How to Replace a Tone-Clock Circuit Pack". If replacement does not solve the problem, follow normal escalation procedures.

f. Error Type 257—This error indicates transient communication problems with this circuit pack . This error is not service-affecting and no action is required.

g. Error Type 513—This circuit pack has an on-board hardware failure. Replace the circuit pack using the procedure described in preceding section, "How to Replace a Tone-Clock Circuit Pack".

h. Error Type 769—This error can be ignored, but look for other errors on this circuit pack.

i. Error Type 1025—This error is not service-affecting and no action is required.

j. Error Type 1538—The circuit pack was taken out of service because of an excessive rate of uplink messages. Use **test tone-clock PC long** to reset the circuit pack and put it back into service. If the command is not successful, replace the circuit pack using the procedure described in the preceding section, "How to Replace a Tone-Clock Circuit Pack". If the alarmed circuit pack is the active Tone-Clock of a duplicated pair, first interchange Tone-Clocks via the **set tone-clock PC** command to avoid a service outage. If the error occurs again within 15 minutes, follow normal escalation procedures.

k. Error Type 2049 or 2305—These errors indicate the loss of one or more clock signals from the reported Tone-Clock circuit pack, which was active at the time of the error. The effect of any of these errors is described in the table for error type 1. Diagnosis of the problem is the same for all four error types, with the exception noted below.

   1. Examine the Hardware Error Log for errors reported against circuit packs in the same Port Network, especially TDM-CLK, TONE-BD, DUPINT, SW-CTL, and EXP-INTF. Follow the repair or replacement procedures indicated for any such errors found.

2. If the error is not corrected by resolving errors found in step 1, the Tone-Clock circuit pack should be replaced. See the preceding section, "How to Replace a Tone-Clock Circuit Pack".

   NOTE:
   Replacing the circuit pack and retesting it with the **test tone-clock** command is not adequate to retire this alarm and return the Tone-Clock Circuit Pack to full service; the Clock Health Inquiry test (#46) will continue to fail. Because the ability to generate clocks was considered lost, once any repairs have been made it is necessary to execute the **set tone-clock PC override** command, forcing the circuit pack to become active. If the problem has not actually been corrected, this action may cause a disruption in service for active digital facilities users.

3. If error 2305 or 3848 persists, all clock signals from the indicated board were lost. If the reported Tone-Clock circuit pack is in a Port Network with duplicated Tone-Clocks, the problem may lie with the circuit pack responsible for selecting the active Tone-Clock circuit pack (the *t/c selector*).

   - For a PPN, the t/c selector is the DUPINT circuit pack on carrier A.
   - For an EPN, the t/c selector is the active EXP-INTF circuit pack that is connected to the PPN. This is EXP-INTF 2A01 or 2B02 for EPN1 and 3A01 or 3B02 for EPN2.

   The t/c selector circuit pack of interest is the one which was active at the time the error was logged. This is the currently active t/c selector unless there has been an SPE interchange for PPN problem, or an EXP-INTF link switch for EPN problem, In order to determine whether an interchange has occurred since the TONE-BD error, examine the **display initcauses** log for SPE interchanges, and EXP-LNK entries in the hardware error log for expansion link interchanges.

   If the t/c selector circuit pack was not replaced as part of the previous step, replace it now. Follow procedures described in "Replacing Defective SPE Circuit Packs" in Chapter 8, "Reliability Systems: A Maintenance Aid" for the DUPINT circuit pack, or in the EXP-INTF section of this chapter for the Expansion Interface.

4. If the error has not been corrected at this point, there is a problem with the TDM Bus within the Port Network containing the reported Tone-Clock circuit pack. This may include TDM Bus intercarrier cables, Bus terminators, bent pins on the backplane, and errors on any circuit pack plugged into the same Port Network. Refer to the TDM-BUS section.

5. If the problem persists, follow normal escalation procedures.

l. Error Type 2561—This error indicates that a Tone-Clock circuit pack, with a different circuit pack code as required for this system, has been inserted in the port slot as shown in the Hardware Error Log. To resolve this error, refer to the "How to Replace a Tone-Clock Circuit Pack" section for an appropriate circuit pack code and replace the Tone-Clock circuit pack according to the procedures indicated for this system. The meanings of the aux data values are as follows:

1001	A TN756 Tone-Clock circuit pack is in the PPN of a one port network system without High or Critical Reliability (Multicarrier Cabinet).
1002	A TN756 Tone-Clock circuit pack is in the EPN of a one port network system without High or Critical Reliability (Multicarrier Cabinet).
1003	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN768, TN780 or TN2182) is in a one port network system without High or Critical Reliability (Multicarrier Cabinet).
1004	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN768, TN780 or TN2182) is in a High or Critical Reliability system.
1005	Same as for aux value 1004.

m. Error Type 3329—The system attempted but failed to interchange Tone-Clock circuit packs. (This error occurs only in Port Networks with duplicated Tone-Clocks.) The fault may lie in the standby Tone-Clock or in the circuit pack that controls selection of the active Tone-Clock (the *t/c selector*). The goal of the following procedure is to ensure that both Tone-Clocks can be interchanged into while either t/c-selector circuit pack is active.

1. Examine the Error Log for errors reported against circuit packs in the same Port Network, paying special attention to TDM-CLK, TONE-BD, DUPINT, SW-CTL, and EXP-INTF. Follow the procedures indicated for any such errors found. After eliminating the above potential problem sources, proceed with the following steps.
2. Determine which circuit pack was controlling the choice of Tone-Clock at the time the error occurred.
   - For a PPN, the t/c selector is the DUPINT circuit pack on the A-carrier.
   - For an EPN, the t/c selector is the active EXP-INTF circuit pack that is connected to the PPN. This is EXP-INTF 2A01 or 2B02 for EPN1 and 3A01 or 3B02 for EPN2.

   The t/c-selector circuit pack of interest is the one which was active at the time the error was logged. An EXP-LNK interchange since the time of the error may have made that circuit pack the current standby. Determine whether an interchange affecting the t/c selector has occurred since the TONE-BD error. When investigation an EPN Tone-Clock, look for EXP-LNK entries in the hardware error log for PNC interchanges, which would affect the EXP-INTF.

3. If the t/c selector has not undergone an interchange since the error occurred, go to the next step. If such an interchange has taken place, interchange back to the formerly active t/c selector. Use the **set expansion-interface** command when investigating an EPN Tone-Clock.) If the interchange attempt fails due to other errors, resolve those problems first.
4. Interchange the Tone-Clock circuit packs using the **set tone-clock PC** command. If the command succeeds, the interchange which previously failed has been accomplished and the problem has been satisfactorily resolved. If it fails, proceed to the next step. (You may want to proceed in any case to definitively test all relevant components.)
5. Interchange the t/c selector using **set expansion-interface** if investigating an EPN. If errors prevent this interchange, resolve them first.
6. Attempt again to interchange Tone-Clocks with the **set tone-clock PC** command.
   — If the Tone-Clock interchange failed for both t/c selectors:

   Replace the standby Tone-Clock circuit pack which could not be interchanged into and return to this step. (See "How to Replace a Tone-Clock Circuit Pack".) Test the new circuit pack as follows:

   a. Execute the set tone-clock PC command.
   b. Execute a set expansion-interface, if this is an EPN Tone-Clock.
   c. Execute the set tone-clock PC command again.

   If these commands successfully complete, the problem has been resolved.

   — If these commands successfully complete, the problem has been resolved.

   — If the Tone-Clock circuit packs successfully interchange when one EXP-INTF is active, but not when the other one is:

   The t/c-selector circuit pack on the failing side is suspect.

   a. Replace the A carrier DUPINT or EXP-INTF board that is active when the Tone-Clock interchange fails. (Follow procedures in "Replacing Defective SPE Circuit Packs" in Chapter 8, "Reliability Systems: A Maintenance Aid" for the DUPINT circuit pack; for the Expansion Interface, see EXP-INTF.)

b. Make sure the new t/c selector is active and execute the set tone-clock PC command.

— If both Tone-Clocks can be interchanged into, and interchanges succeed when either t/c selector is active, the problem has been resolved. If the problem persists after following the above steps, follow normal escalation procedures.

n. Error Type 3840—This error is not service-affecting and can be ignored. It indicates that the circuit pack has received a bad control message from the switch.

o. Error Type 3848—This error indicates that the Tone/Clock circuit pack had a loss of clock. If error 2305 is also logged, see note (j).

p. Error Type 3872—These errors indicate this Tone/Clock circuit pack had a loss of Data Clocks. This error will impact mainly users on station connected to Digital circuit packs. These users could be with out service. If error 2049 is also logged see note (i).

q. Error type 3999 indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *SAKI Sanity Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Use the **list configuration control** command to find the Tone-Clock Circuit Pack Code of the system. Look for the Short and Long Test Sequences according to the Tone-Clock Circuit Pack Code.

For a system with a TN756 Tone-Clock Circuit Pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Sanity Test (#53) (a)		X	D
Clock Health Inquiry Test (#46)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Detection Verification Test (#42) (b)	X	X	ND
Tone Detection Audit/Update Test (#43) (b)	X	X	ND
Tone Generator Crosstalk Test (#90) (b)		X	ND
Tone Generator Transmission Test (#40) (b)	X	X	ND
Tone Generator Audit/Update (#41) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to XXX-BD (Common Port Circuit Pack) documentation for descriptions of these tests.

b. Refer to TONE-PT (Tone Generator) documentation for descriptions of these tests.

For a system with a TN768, TN780 or TN2182 Tone-Clock Circuit Pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Reset Test (#53) (a)		X	
Clock Health Inquiry Test (#46)	X	X	
Control Channel Loop Around Test (#52) (a)	X	X	
Tone Generator Crosstalk Test (#90) (b)		X	
Tone Generator Transmission Test (#40) (b)	X	X	
Tone Generator Audit/Update (#41) (b)	X	X	
TDM Bus Clock Circuit Status Inquiry Test (#148) (c)	X	X	
TDM Bus Clock Slip Inquiry (#149) (c) (e)	X	X	
TDM Bus Clock PPM Inquiry Test (#150) (c)	X	X	
TDM Bus Clock Parameter Update Test (#151) (c)	X	X	
Board Type Check Test (#574) (c)	X	X	
Standby Reference Health Check Test (#651) (c,d)		X	

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to XXX-BD for descriptions of these tests.

b. Refer to TONE-PT for descriptions of these tests.

c. Refer to TDM-CLK for descriptions of these tests.

d. This test runs only on the standby Tone-Clock circuit pack in a Port Network with duplicated Tone-Clocks (High or Critical Reliability systems). The circuit pack must be a TN780 with firmware version 2 or above or a TN2182.

Clock Health Inquiry Test (#46)

This inquiry reads special data stored in memory to determine if this Tone-Clock circuit pack had a loss of any of three clock types:

- SYSCLK
- SYSFM
- SYSDCLK

If this data indicates this Tone-Clock circuit pack had a loss of any of these clocks, the inquiry reports FAIL. In addition, if TDM-CLK error 1 is at threshold, this test will FAIL. TDM-CLK error 1 indicates a suspect clock is at the edge of its specified frequency. If the circuit pack did not have a loss of clock or TDM-CLK error 1 at threshold, the inquiry reports PASS.

This is not really a test, in the sense that it simply reports status held by the system, and does not generate new information or raise alarms. If this test fails with no error code, there is at least one Major alarm against a Tone-Clock circuit pack. If this test fails with an error code of 1, there is at least one Minor off-board alarm against a TDM-CLK.

Table 11-370. TEST #46 Clock Health Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at 11-minute intervals for a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
none	FAIL	This Tone-Clock circuit pack had an apparent loss of clock. One or more of error types 2049, 2305, 3834, and 3872 will appear in the error log. Correct the problem according to the appropriate error log entries. Once this test fails, the only way to make it pass, and to retire the associated alarm, is to repair the problem and to execute the **set tone-clock P[illegible]verride** command against the indicated Tone-Clock circuit pack. **NOTE:** If power is removed from a carrier in a duplicated system, and that SPE has the active TONE-CLK, a MAJOR alarm is raised for the TONE-BD. The TONE-BD will be out of service and when running Test 46 (Clock Health Test) it will fail, indicating a loss of any of these three clocks, SYSCLK, SYSFM, and SYSDCLK. To restore the TONE-BD to service you must execute the **set tone spe health-override** command.

Continued on next page

Table 11-370. TEST #46 Clock Health Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	This Tone-Clock circuit pack is suspect of having a clock at the edge of its specified frequency. A Tone-Clock circuit pack with this problem can cause Expansion Interface circuit packs to go out-of-frame or report no neighbor conditions, thus causing EPNs to go down 1. Replace the Tone-Clock circuit pack identified in the error log. Refer to the "How to Replace a Tone-Clock Circuit Pack" section. 2. If the error persists, follow normal escalation procedures.
	PASS	This Tone-Clock circuit pack has not reported a loss of clock.

TONE-PT (Tone Generator)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TONE-PT	MAJOR	test tone-clock PC sh	Tone Generator
TONE-PT	MINOR	test tone-clock PC sh	Tone Generator
TONE-PT	WARNING	release tone-clock PC sh	Tone Generator

NOTE:
Replacing the tone/clock circuit pack requires a special procedure which is described in the documentation for TONE-BD. That section also describes the LED display for this board.

The tone generator resides on the Tone/Clock circuit pack and provides all system tones such as dial tone, busy tone, and so on. If an active tone generator fails, its port network may not have tones (see the Tone Generator Transmission Test #40). For instance, a user may go off-hook and hear no dial tone. This problem will affect only users on the same port network in which the faulty Tone-Clock circuit pack resides. The system will be able to process certain type of calls (that is, internal calls will succeed while outgoing calls will not).

The Tone-Clock circuit pack also provides the clocks for the system and can serve as the synchronization reference. Therefore, when resolving alarms on the Tone-Clock circuit pack, the TDM-CLK (TDM Bus Clock) and SYNC (Synchronization) Maintenance documentation should be utilized as well as the TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation.

See the section on TONE-BD Maintenance in this manual for a discussion of the relationship of Tone-Clock circuit packs with the various Reliability Options.

Hardware Error Log Entries and Test to Clear Values

Tone Generator Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tone-clock PC r 1
1(a)	17664	Tone Generator Audit/ Update Test (#41)	MAJOR/ MINOR	ON	test tone-clock PC r 2
18(b)	0	busyout tone-clock PC	WARNING	OFF	release tone-clock PC
130(c)		None	MINOR	ON	test tone-clock PC Sh
257(d,f)	17667	None	MINOR	ON	
513(e,f)	17666	Tone Generator Audit/ Update Test (#41)	MINOR	ON	test tone-clock PC r 3
769	Any	Transmission Test (#40)	MAJOR/ MINOR	ON	test tone-clock PC r 3
1025		Crosstalk Test (#90)	MAJOR/ MINOR	ON	test tone-clock PC l r 2
1281(g)	Any	Tone Generator Audit/ Update Test (#41)	MINOR	ON	test tone-clock PC r 3

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. A failure in the tone generation facility on the indicated circuit pack has been detected. Replace the circuit pack. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.

b. The indicated Tone-Clock circuit pack has been made unavailable via the **busyout tone-clock PC** command. It only applies to systems which have the High or Critical Reliability Option administered, because only a standby Tone-Clock circuit pack may be made busy by that command. To resolve this error, execute the **release tone-clock PC** command for the alarmed circuit pack.

c. This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. The tone generation facility is having problems verifying that tones have been connected as requested.

e. The tone generation facility may or may not be able to generate tones.

f. Infrequent errors, at a rate which does not bring up an alarm, probably do not affect service, unless there are customer complaints of no tones, or incorrect tones which can not be explained in any other way. However, if an alarm is raised because this error is being repeatedly logged, then the circuit pack should be replaced. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.

g. The system-parameters country-options administration are setup such that a TN780 or TN2182 are required and the existing tone-clock circuit pack will not provide the needed functionality. The Base Tone Generation Set on page 1 or the custom tones beginning on page 2 of the system-parameters country options form may have values not supported by the existing tone-clock.

This error (1281) indicates that the system parameters country-options form has custom tones translated and that the alarmed tone board does not support the customized tones. TN768 tone boards do not support any customized tones. TN780 tone boards support up to 6 customized tones using the following frequencies/levels only:

Silence

350Hz at 17.25 dB

425Hz at 4.0 dB

425Hz at 11.0 dB

425Hz at 17.25 dB

440Hz at 17.25 dB

350Hz+425Hz at 4.0 dB

350Hz+440Hz at 13.75 dB

480Hz at 17.25 dB

620Hz at 17.25 dB

440Hz+480Hz at 19.0 dB

404Hz at 11.0 dB

404Hz at 16.0 dB

480Hz+620Hz at 24.0 dB

404Hz+425Hz at 11.0 dB

375Hz+425Hz at 15.0 dB

404Hz+450Hz at 11.0 dB

1000Hz at 0.0 dB

1000Hz at +3.0 dB

525Hz at 11.0 dB

1400Hz at 11.0 dB

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *SAKI Sanity Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Use the **list configuration control** command to find the Tone-Clock Circuit Pack Code of the system. Then look for the Short and Long Test Sequences according to the Tone-Clock Circuit Pack Code.

For a system with a TN756 Tone-Clock Circuit Pack

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Sanity Test (#53) (a)		X	D
Clock Health Inquiry Test (#46) (b)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Detection Verification Test (#42) (c)	X	X	ND
Tone Detector Audit/Update Test (#43) (c)	X	X	ND
Tone Generator Crosstalk Test (#90)		X	ND
Tone Generator Transmission Test (#40)	X	X	ND
Tone Generator Audit/Update Test (#41)	X	X	ND

1 D = Destructive; ND = Nondestructive

a. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for descriptions of these tests.

b. Refer to TONE-BD (Tone-Clock Circuit Pack) Maintenance documentation for descriptions of these tests.

c. Refer to Dual Tone Multifrequency Receiver Port (TTR) (DTMR-PT) or General Purpose Tone Detector (CPTR) (GPTD-PT) Maintenance documentation for descriptions of this test.

For a system with a TN768, TN780 or TN2182 Tone-Clock Circuit Pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Reset Test (#53) (a)		X	D
Clock Health Test (#46) (b)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Generator Crosstalk Test (#90)		X	ND
Tone Generator Transmission Test (#40)	X	X	ND
Tone Generator Audit/Update Test (#41)	X	X	ND
TDM Bus Clock Circuit Status Inquiry Test (#148) (c)	X	X	ND
TDM Bus Clock Slip Inquiry Test (#149)(e)(c)	X	X	ND
TDM Bus Clock PPM Inquiry Test (#150) (c)	X	X	ND
TDM Bus Clock Parameter Update Test (#151) (c)	X	X	
Board Type Check Test (#574) (c)	X	X	
Standby Reference Health Check Test (#651) (c,d)		X	

1 D = Destructive; ND = Nondestructive

Notes:

a. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for descriptions of these tests.

b. Refer to TONE-BD (Tone-Clock Circuit Pack) section for descriptions of these tests.

c. Refer to TDM-CLK (TDM Bus Clock) section for descriptions of these tests.

d. This test only runs on the Standby Tone-Clock circuit pack in a Port Network with more than one Tone-Clock circuit pack (High or Critical Reliability Option). The circuit pack must be a TN780 code with firmware revision 2 or above, or a TN2182.

Tone Generator Transmission Test (#40)

The purpose of this test is to verify that the tone generation hardware on the tone-clock circuit pack is capable of generating a subset of system tones and a set of test tones. This test does not verify all system tones the tone generator produces during normal system operation.

The test is performed in two parts. For the first part, the Tone Generator is told to generate the touch-tone digits. The digits are received and checked by a Tone Detector touch-tone detector. If any of the digits fail, the test is repeated using a touch-tone detector in another Tone Detector circuit pack.

For the second part, the Tone Generator is told to generate call progress tones that are detected and identified by a tone detector. These tones are:

- 440 Hz
- 2225 Hz
- Digital Count

The tone generator is then told to generate a sequence of test tones whose output levels are measured by a tone detector. These tones are:

- 404 Hz at 0 dB
- 1004 Hz at -16 dB
- 1004 Hz at 0 dB
- 2804 Hz at 0 dB

A Tone Detector general purpose tone detector listens for the tones and measures the quality of the tone. If any of the measured values are not within limits, the test is repeated using a general purpose tone detector in a different Tone Detector circuit pack. If the values are still out of the limits, the test will fail.

For all the failure cases of Test #40, do the following:

1. Check that all Tone Detector circuit packs have the same companding mode as that administered for the system. Correct the situation if there is a mismatch.
2. Run the long test sequence: **test tone-clock PC long repeat 1**.
3. If the problem persists, replace the Tone-Clock circuit pack by following the steps outlined in the "How to Replace a Tone-Clock Circuit Pack" section.

Table 11-371. TEST #40 Tone Generator Transmission Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	The system was not able to allocate all the resources needed for this test or there was an Internal System Error.
1	ABORT	The system could not allocate all the resources needed to test the DTMF tones.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM Bus via the **test tdm port-network PN#** command. Refer to TDM-BUS section for details. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
1003	ABORT	The system could not allocate a tone receiver for the test connection. This can happen when the system is heavily loaded or there is not a Tone Detector circuit pack in the port network where this test is being executed. 1. Make sure there is a Tone Detector circuit pack in the same port network. 2. If a Tone Detector circuit pack is missing, install one in the same port network. 3. Allow approximately 1 minute for Tone Detector maintenance to run on the newly inserted Tone Detector circuit pack. 4. Retry the command at 1-minute intervals a maximum of 5 times. 5. If the test continues to abort, follow normal escalation procedures.

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Table 11-371. TEST #40 Tone Generator Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1022	ABORT	[G3r V2] Tone detection for the system is administered as wide broadband (tone detection mode 5), and the Tone Detector used for this test was not a TN420C or TN2182 (the only circuit packs with this capability). GPTD ports on other types of Tone Detector circuit packs are taken out of service since they cannot provide the administered function. 1. Change the tone-detection mode administered on the system-parameters country-options form (see *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653, Or 2. Remove all non-TN420C and non-TN2182 circuit packs from the system.
2000	ABORT	Response to the test request was not received within the allowable time period. System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
1 (a)	FAIL	DTMF generation failed for the active tone generator.
105 (a)	FAIL	Generation of 440-Hz failed.
109 (a)	FAIL	Generation of 2225-Hz failed.
110 (b)	FAIL	Generation of 404-Hz level invalid.
111 (b)	FAIL	Generation of 1004-Hz low level invalid.
112 (b)	FAIL	Generation of 1004-Hz high level invalid.
113 (b)	FAIL	Generation of 2804-Hz level invalid.

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Table 11-371. TEST #40 Tone Generator Transmission Test — *Continued*

Error Code	Test Result	Description/ Recommendation
115 (b,c)	FAIL	Generation of digital count sequence invalid.
120 (a)	FAIL	Generation of quiet tone failed.
1044 (a)	FAIL	DTMF generation failed to generate Digit 1 for the standby tone generator.
1045 (a)	FAIL	DTMF generation failed to generate Digit 5 for the standby tone generator.
1046 (a)	FAIL	DTMF generation failed to generate Digit 9 for the standby tone generator.
1047 (a)	FAIL	DTMF generation failed to generate Digit D for the standby tone generator.
	PASS	The tone generation facility is able to generate and transmit all the tones.

Notes:

Except in Port Networks containing more than one Tone-Clock circuit pack, replacing the circuit pack is a service disrupting procedure. The test should be run several times with more than one failure before the replacement policy specified in the following notes is executed. Use the procedure described in "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.

a. All the failure error codes marked with (a) may affect users if the failure is on the active tone generator. When this type failure is detected, the system will attempt to move the tone generation function to the alternate Tone-Clock circuit pack, if one is present in the affected Port Network. When the tone generation facility fails in this way, especially in a Port Network without duplicated Tone-Clock circuit packs, the faulty Tone-Clock should be replaced promptly.

b. All the failure error codes marked with (b) are almost transparent to the user. Again, when this type failure is detected, the system will attempt to move the tone generation function to the alternate Tone-Clock circuit pack, if one is present in the affected Port Network. Users may or may not hear any noisy tones. This type of failure affects maintenance on other objects. Maintenance may not be able to run on other objects which use the tone generation facility (that is, Tone Detector Circuit Pack maintenance). In this case, the Tone-Clock circuit pack can be replaced as suitable to the customer.

c. Error code 115 may also be caused by TDM Bus corruption. This normally means a physical problem with bent backplane pins, TDM/LAN Bus cabling, or TDM/LAN Bus terminators. Such physical problems should especially be suspected if board replacement or other physical activity has occurred just before this error is observed.

   Use **display errors** to look for errors on other circuit packs in the carriers of the same Port Network as the indicated Tone-Clock. If any are found, they should be resolved if possible, and the Tone-Clock circuit pack retested. If this does not clear the problem, the Tone-Clock circuit pack should be replaced and the new one tested. If the problem persists, follow instructions for TDM Bus maintenance in this manual.

Tone Generator Update/Audit Test (#41)

The active tone generation facility is refreshed with all the time slot tone information. This test also triggers in-line error messages the Tone-Clock circuit pack generates when it detects problems by itself.

A check is also made between the type of tone-clock being tested and the type of tone-clock needed based on system administration. The administration on the system-parameters country-options form may imply that a TN780 or TN2182 is required.

Table 11-372. TEST #41 Tone Generator Update/Audit Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test.
2100	ABORT	System resources required for this test are not available.
1	FAIL	The system requires a TN780 TN2182 tone-clocks to support the currently administered country-options tone generation parameters. 1. Check the administration on the system-parameters country-option form. Specifically, the Base Tone Generation Set on page 1 and any custom tone administration beginning on page 2. 2. Replace existing tone-clock circuit packs with a TN780 or TN2182.

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Table 11-372. TEST #41 Tone Generator Update/Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The system requires TN2182 tone-clocks to support the currently administered country-options tone generation parameters. 1. Check the administration on the system-parameters country-option form. Specifically, the Base Tone Generation Set on page 1 and any custom tone administration beginning on page 2. 2. Replace existing tone-clock circuit packs with TN2182s.
	PASS	The tone generation facility has been successfully refreshed with its time-slot translation and system administration is consistent with this type of tone-clock. 1. Display the Hardware Error Log via the **display errors** command to make sure this circuit pack did not generate new errors. 2. If errors persist, follow normal escalation procedures.

Tone Generator Crosstalk Test (#90)

This test checks the ability of the Tone Generator to talk on a specific time slot. The tone generator is told to talk on a specific time slot. The other idle time slots are checked to make sure the Tone Generator put the tone on only the specified time slot.

Table 11-373. TEST #90 Tone Generator Crosstalk Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM-BUS via the **test tdm port-network PN#** command. Refer to TDM-BUS section for details.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow normal escalation procedures.

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Table 11-373. TEST #90 Tone Generator Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The Tone Generator could be defective. In a Port Network with more than one Tone-Clock circuit pack, the system will attempt to move the tone generation function to the alternate one. 1. Test the Tone-Clock circuit pack again via the **test tone-clock PC** command 2. If the test fails again, look at the Hardware Error Log for Tone Detector circuit pack errors. 3. If there are Tone Detector circuit pack errors, refer to Tone Detector Maintenance documentation (DTMR-PT, GPTD-PT, CLAS-PT, ETR-PT) to resolve these errors first. 4. If there are no Tone Detector circuit pack errors, then the Tone-Clock circuit pack should be replaced. See "How to Replace a Tone-Clock Circuit Pack" in the TONE-BD section.
	PASS	The tone generation facility is able to put tones out.

TSC-ADM (Administered Temporary Signaling Connections)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TSC-ADM	none	none	Administered Temporary Signaling Connections
TSC-ADM	none	none	Administered Temporary Signaling Connections

No alarms are generated for the TSC-ADM (Administered Temporary Signaling Connections) MO. Due to the unusual length of the full name of this MO (that is, Administered Temporary Signaling Connections), the abbreviation Administered TSC is used often in this Maintenance documentation.

In general, administered temporary signaling connections provide a path through ISDN-PRI switches for supplementary D-channel messages. ISDN-PRI applications [that is, Distributed Communications System (DCS)] use temporary signaling connections to exchange user information across an ISDN-PRI network. What makes Administered Temporary Signaling Connection unique is that these particular Temporary Signaling Connections stay active for an extended period time (that is, similar to a permanent data connection). These ADM Temporary Signaling Connections are used for DCS features that require a NCATSC, and the ADM TSC serves as the logical channel function in a DCS network.

A Non-Call Associated Temporary Signaling Connection (NCATSC) is a virtual connection established within a D-channel. The NCATSC connection provides user to user service by exchanging USER INFORMATION messages through the virtual connection in a D-channel without associating any B-channel connections.

An *Administered TSC* is a special NCA Administered TSC defined for the DCS over the ISDN-PRI D-channel application of G3iV1.1-286 or G3iV2-386. The Administered TSC connection is a special type of NCATSC that has an administratively defined endpoint and is established for an extended period of time.

There are two types of ADMTSCs:

- Permanent

  TSCs are established by the originating PBX (that is *Near-end* ADM TSC) or by the terminating PBX (that is, *Far-end* ADM TSC). Once these ADMTSCs are established, they remain active.

- As-Needed

TSCs are established on an as-needed basis. In this case, the ADMTSC is established whenever it is needed, and not before.

ADMTSC maintenance provides a strategy to verify that a far-end can respond to an ISDN-PRI USER INFORMATION TSC heartbeat message, thereby indicating that user to user signaling is functioning. In addition, maintenance can retrieve the status of the ADMTSC's connection state.

Since ADMTSCs are administered on a per signaling group basis, the health of an ADMTSC also depends on the state of the D-channel or D-channel pair administered per signaling group. Refer to ISDN-SGR (ISDN-PRI Signaling Group) Maintenance documentation for details on ISDN-PRI NFAS and D-channel Backup maintenance. The two administration commands for ADMTSCs are as follows:

- **add signaling group #**
- **change signaling group #**

The two maintenance commands for ADMTSCs are as follows:

- **test tsc-administered signaling group #[/tsc index]**
- **status tsc-administered signaling group #/tsc index**

Hardware Error Log Entries and Test to Clear Values

ADM TSC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3840-3967(a)	tsc index #	test tsc-administered			

Notes:

a. There is no Test to Clear Value for error types 3840-3967. The error types provides the following additional data that may prove useful when tracking down problems.

   This error indicates that a TSC Heartbeat Inquiry Test was run on an Active far-end Administered TSC from the switch. Upon receiving the heartbeat message, the network communicated to the switch that the call reference value is not currently in use on the ISDN interface. As a result, the error was logged. Check the signaling group status of the D-channel or D-channel pair via the **status signaling-group <group>** command for the Administered TSC. Check the status of the Administered TSC via the **status tsc-administered** command. Also check the administration of the Administered TSC on the switch.

   This error may only be affecting service for some DCS customers. Upon receipt of this error condition, the switch tears down and re-establishes the ADMTSC within 20 minutes.

b. The port field in the error log contains the signaling group number for TSC-ADM errors.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *TSC Heartbeat Inquiry Test,* for example, you may also clear errors generated

from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TSC Heartbeat Inquiry Test (#604)			ND

1 D = Destructive; ND = Nondestructive

TSC Heartbeat Inquiry Test(#604)

This test can be invoked by system technician personnel for any ADMTSC administered in the switch. The following table indicates the possible error conditions that might be encountered when the test is invoked. Most of the error conditions do not log an error, but switched services may take some type of recovery action in certain instances.

This test sends a USER INFORMATION TSC heartbeat message inquiry across an Administered TSC to determine if the far-end can respond to a USER INFORMATION TSC heartbeat message.

Table 11-374. TEST #604 TSC Hartbeat Inquiry Test

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Reissue the **test tsc-administered** command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	The Administered TSC does not exist. 1. Display the administration for the Administered TSC. 2. If an Administered TSC is exists, reissue the **test tsc-administered** command. 3. If the test continues to abort, escalate problem.
1113	ABORT	The D-channel is out-of-service. 1. Refer to the ISDN-LNK (ISDN-PRI Signaling Link Port) Maintenance documentation.

Continued on next page

Table 11-374. TEST #604 TSC Hartbeat Inquiry Test

Error Code	Test Result	Description/ Recommendation
1145	ABORT	There is congestion in the network. 1. Issue the **status tsc-administered** command at one-minute intervals a maximum of five times. 2. If the congestion does not clear, disable and enable the Administered TSC via the **change sig-group <group>** command. To disable the Administered TSC, display the (administration) Signaling Group Form via the **change sig-group <group>** command where **<group>** refers to the number of the signaling group under which the suspect TSC is administered. Change the Enable field to "n." To enable the ADMTSC, change the "Enable" field to "y." 3. If the congestion still does not clear, check other nodes in the network. If congestion persists, then escalate the problem.
1146	ABORT	The congestion just occurred in the network. 1. Issue the **status tsc-administered** command at one-minute intervals a maximum of three times. 2. If congestion does not clear, disable and enable the Administered TSC via the **change sig-group <group>** command. To disable the Administered TSC, display the (administration) Signaling Group Form via the **change sig-group <group>** command where **<group>** refers to the number of the signaling group under which the suspect TSC is administered. Change the Enable field to "n." To enable the ADMTSC, change the "Enable" field to "y." 3. If congestion still does not clear, check the other nodes in the network. If the congestion persists, escalate the problem.

Continued on next page

Table 11-374. TEST #604 TSC Hartbeat Inquiry Test

Error Code	Test Result	Description/ Recommendation
1147	ABORT	The ADMTSC is being torn down. 1. Issue the **status tsc-administered** command at one-minute intervals a maximum of three times. 2. If ADMTSC is still down, disable and enable the ADM TSC via the **change sig-group <group>** command. **NOTE:** To disable the ADMTSC, display the (administration) Signaling Group Form via the **change sig-group <group>** command where **<group>** refers to the number of the signaling group under which the suspect TSC is administered. Change the Enable field to "n." To enable the ADMTSC, change the "Enable" field to "y." 3. If the ADMTSC is still down, check the other nodes in the network. If the ADMTSC is still down, escalate the problem.
1148	ABORT	The ADMTSC is enabled, but inactive (near-end). 1. Disable and enable the ADMTSC. 2. Reissue the **test tsc-administered** command. 3. If the ADMTSC is still inactive, check the other nodes in the network.
1149	ABORT	The ADMTSC is disabled. 1. Enable the TSC, and see if the status indicates "active." 2. Reissue the **test tsc-administered** command. 3. If the TSC still disabled, remove the ADMTSC from the system.
1181	ABORT	Ran out of ADMTSC resources. 1. Reissue the **test tsc-administered** command at one-minute intervals a maximum of three times. 2. If test continues to abort, escalate the problem.

Continued on next page

Table 11-374. TEST #604 TSC Hartbeat Inquiry Test

Error Code	Test Result	Description/ Recommendation
1182	ABORT	The BX.25 link is down at the gateway. 1. Disable the ADMTSC. 2. Check the status of the gateway link via the **status link link-no** command. 3. Once the gateway link indicates an "in-service" state, enable the Administered TSC. 4. Reissue the **test tsc-administered** command. 5. If the test still aborts, escalate the problem.
2000	ABORT	The Administered TSC is not responding to a TSC heartbeat inquiry. 1. Retry the **test tsc-administered** command at one-minute intervals a maximum of three times. 2. If the problem continues to fail, obtain the status of the D-channel or D-channel pair associated with the ADMTSC via the **status sig-group <group>** command. If the D-channel is INS (that is, in-service) and the status of the ADMTSC appears to be active, disable and enable the ADMTSC through administration. **NOTE:** To disable the ADMTSC, display the (administration) Signaling Group Form via the **change sig-group <group>** command where **<group>** refers to the number of the signaling group under which the suspect TSC is administered. Change the "Enable" field to "n." To enable the ADMTSC, change the "Enable" field to "y." 3. Reissue the **test tsc-administered** command. 4. If the test fails, check the ADMTSC node on the other side of the network to verify that the ADM TSC is indeed active. 5. Escalate the problem.
2012	ABORT	Internal System Error. 1. Reissue the **test tsc-administered** command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-374. TEST #604 TSC Hartbeat Inquiry Test

Error Code	Test Result	Description/ Recommendation
1	FAIL	The Administered TSC is not active (far-end). 1. Reissue the **test tsc-administered** command. 2. Verify that the Administered TSC node on the other side of the network is active. 3. Disable and enable the Administered TSC. 4. Retry the **test tsc-administered** command. 5. If test fails, escalate the problem.
2	FAIL	Facility IE (Information Element) reject. 1. Check all other nodes in the network, and make sure Administered TSC is active. 2. Escalate the problem.
	PASS	The Administered TSC responded to a heartbeat.

TTR-LEV (TTR Level)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
TTR-LEV	WARNING	See Note[1]	TTR Level

1 See the "Repair Procedure for the TTR Level Maintenance Object" section.

A TN748 Tone Detector circuit pack and the TN744 Call Classifier circuit pack provides touch tone receivers (TTRs or DTMR-PTs)) which are devices used to interpret touch tone calling signals and to translate the dual tones into the following valid digits: 0 through 9, *, and #. A Tone Detector circuit pack is a resource shared by all PBX users. The term "touch tone" formerly bore an AT&T trademark while the term "dual tone multifrequency receiver" has been the generic term used for this kind of device. A Tone Detector circuit pack also has general purpose tone detector ports (GPTD-PTs) to detect call progress tones, modem answer tones, and transmission test tones. In G3iV1.1-286 or G3iV2-386, Call Classifier Ports (CLSFY-PTs) have also been added to detect voice or network intercept tones. A Call Classifier Port (CLSFY-PT) can function as either a DTMR-PT or as a GPTD-PT.

When a user places a call from a digital or analog voice terminal on the switch, a TTR is needed to interpret the dual tone multifrequency signals sent from the voice terminal. The TTR is in use until the total number of digits needed is collected or until a time-out occurs. Dial tone is supplied to a user after receipt of an off-hook signal which signifies that a TTR is connected and ready to receive digits. For example, if there are 20 TTRs in the system being used simultaneously by 20 users at a given time, then the 21st user would not receive dial tone until a TTR becomes available. It is for this reason that it is necessary to have sufficient tone detectors in the system to prevent delay in receiving dial tone. The TTR-LEV errors can be used to determine a shortage of tone detectors. Use the **list measurements tone-receiver** command to determine tone detector usage. For more information on this command, refer to the *DEFINITY. Communications System Generic 1—Administration and Measurement Reports,* 555-200-500. The minimum threshold values assigned on the Maintenance-Related System Parameters Form for TTRs (DTMR-PTs), CPTRs (GPTD-PTs), and CCRs (CLSFY-PTs) should match the number of touch tone receivers (TTR) and tone detectors (GPTD-PT) in the system. The numbers are four TTRs and two GPTDs for each Tone Detector circuit pack [TN748, TN748B, and TN748C, and (the TN756 Combined Tone Detector/Tone-Clock in a single-carrier cabinet system)] used in the switch and 8 CCRs for each Call Classifier Port (TN744) circuit pack. The threshold values are administered via the **change system-parameters maintenance** command on the Maintenance-Related System Parameters Form. The desired numbers are entered in the "TTR" (DTMR-PT), "CPTR" (GPTD-PT), and "Call Classifier" (CLSFY-PT) fields, respectively.

The TTR Level (Touch Tone Receiver Level) MO is used to represent the following possible events:

1. The total number of General Purpose Tone Detector Ports (GPTD-PTs), [also known as Call Progress Tone Receivers (CPTRs)], currently in service is less than the administered threshold number.
2. The total number of Dual Tone Multifrequency Receiver Ports (DTMR-PTs) [(also known as Touch Tone Receiver (TTRs)], currently in service is less than the administered threshold number.

The TTR Level maintenance performs a monitoring function. When one of the above events occurs, the switch reports it. At this point, the system is still operating properly, but the system capacity is reduced.

The above events can occur if:

1. The threshold number of General Purpose Tone Detector Ports (GPTD-PTs) for service or the threshold number of Dual Tone Multifrequency Receiver Ports (DTMR-PTs) for service is administered incorrectly on a Tone Detector circuit pack.
2. Too many General Purpose Tone Detector Ports (GPTD-PTs) or Dual Tone Multifrequency Receiver Ports (DTMR-PTs) have been taken out-of-service for a Tone Detector circuit pack (that is, the ports have been either busied-out by system technician or maintenance has taken them out-of-service).
3. Too many ports have been taken out-of-service for a Call Classifier circuit pack (that is, the ports have been busied-out by system technician or maintenance has taken them out-of-service).
4. There is an insufficient number of General Purpose Tone Detector Ports (GPTD-PTs) or Dual Tone Multifrequency Receiver Ports (DTMR-PTs) in the system for a Tone Detector circuit pack. Or there is an insufficient number of ports in the system for a Call Classifier circuit pack.

Repair Procedure for the TTR Level Maintenance Object

The following is a step-by-step approach to resolve the TTR Level maintenance alarm.

1. Execute the **display error** command. Determine if the TTR-LEV warning alarm is raised against the GPTD-PT level, the DTMR-PT level, or the CLSFY-PT level. In the Hardware Error Log Table, the error type field of the TTR-LEV MO has a value of 2 for DTMR-PT level, a value of 4 for GPTD-PT level, or a value of 6 for CLSFY-PT level.

   Perform the actions described in Step 2 for the DTMR-PT, the GPTD-PT, or the CLSFY-PT.

2. Issue the **change system-parameters maintenance** command. Check the administered value(s) for TTRs and CPTRs for service on the Tone Detector circuit packs or for CCRs on the Call Classifier Port (CLSFY-PT) circuit pack. If a threshold value is set too high, change it to a lower value via the **change system-parameters maintenance** command and wait one minute for the alarm to clear.

   To determine the correct TTR, CPTR, and Call Classifier port values, check the total number of Tone Detector and Tone-Clock circuit pack and Call Classifier circuit packs (TN744) currently in the system. A Tone Detector circuit pack has two GPTD ports and four DTMR ports. A Call Classifier circuit pack has eight ports. Verify that the total number of GPTD-PTs, DTMR-PTs, and/or CLSFY-PTs in the system is greater than or equal to their respective administered threshold values. If not, then you must either (1) add more Tone Detector circuit packs and/or Call Classifier circuit packs to the system as required or (2) reduce the threshold to match the number in the system. If after (1) adding more Tone Detector circuit packs and/or Call Classifier circuit packs or (2) reducing the threshold, the TTR Level alarm is still present, then proceed to Step 3.

3. Execute the **display error** command. Look for a GPTD-PT, DTMR-PT, or CLSFY-PT that has been busied out. A port that has been busied out has a value of 18 in the error type field of the Hardware Error Log.

   For each of the busied-out ports, use the following procedure:

   - Determine why the port was busied out.
   - If the port can be placed back into service, test the port via the **test port PCSSpp** command.
   - If all the tests pass, release the port via the **release port PCSSpp** command. Then wait one minute for the TTR Level alarm to clear.

   If this does not clear the TTR Level alarm, proceed to Step 4.

4. Execute the **display alarm** command. Determine the address of the Tone Detector circuit pack which contains the defective (alarmed) GPTD-PT or DTMR-PT.

   Execute the **test board PCSS long rep 3** command where PCSS is the address (that is, port network number, carrier designation, and slot address) of the Tone Detector circuit pack or Call Classifier circuit pack containing the defective (alarmed) GPTD-PT or DTMR-PT.

   If this does not clear the TTR Level alarm, proceed to Step 5.

5. At this point, the only way to clear the alarm is to replace the Tone Detector circuit pack or Call Classifier circuit pack containing the defective (alarmed) GPTD-PT, DTMR-PT or CLSFY-PT.

Hardware Error Log Entries and Test to Clear Values

TTR Level Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	1	None			
2 (b)	2		WARNING (See the WARNING message below)	OFF	
3 (c)	3	None			
4 (d)	4		WARNING	OFF	
5 (e)	5	None			
6 (f)	6		WARNING	OFF	
7 (g)	7		MAJOR	OFF	
8 (h)	8		MINOR	OFF	
9 (i)	9		MINOR	OFF	

WARNING:
The Alarm is upgraded to MAJOR if the Base Tone Generator is set to 12 (France).

Notes:

a. Error code 1 does not indicate a current error condition. It indicates that the number of DTMR ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

b. The total number of DTMR ports currently in service is below the administered threshold. To clear the alarm, refer to the repair procedure described above.

c. Error code 3 does not indicate a current error condition. It indicates that the number of GPTD ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

d. The total number of GPTD ports currently in service is below the administered threshold. To clear the alarm, refer to the repair procedure describe above.

e. Error code 5 does not indicate a current error condition. It indicates that the number of Call Classifier ports (CLSFY-PT) in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

f. The total number of Call Classifier ports currently in service is below the administered threshold. To clear the alarm, refer to the repair procedure described above.

g. There are currently no DTMR ports in service. To clear the alarm, refer to the repair procedure described above.

h. There are currently no GPTD ports in service. To clear the alarm, refer to the repair procedure described above.

i. There are currently no Call Classifier ports in service. To clear the alarm, refer to the repair procedure described above.

UDS1-BD (UDS1 Interface Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
UDS1-BD	MAJOR	test board PCSSpp sh	UDS1 Interface Circuit Pack
UDS1-BD	MINOR	test board PCSSpp l	UDS1 Interface Circuit Pack
UDS1-BD	WARNING	test board PCSSpp sh	UDS1 Interface Circuit Pack

The UDS1 Interface circuit pack provides an interface to the DS1 facility. UDS1 Interface circuit packs include the TN464B circuit pack and the TN464C circuit pack.

The TN464B circuit pack is designed to support 32 DS0 channels on a 2.048 Mbps DS1 link, and the TN464C (or greater vintage) circuit pack is designed to support either 24 DS0 channels on a 1.544 Mbps DS1 link or 32 DS0 channels on a 2.048 Mbps DS1 link. The TN464C (or greater vintage) circuit pack is optioned via a removable strap on the circuit pack. The 2 strap positions are labeled "24CHNL" or "32CHNL."

The DS0 channels can be administered either as trunks to other switches, lines to off-premises stations, ports to line-side PRI terminating devices, or as ports to other line-side non-PRI terminating devices.

NOTE:
DS0 channels on the TN464B circuit pack can be administered only as trunks to other switches.

UDS1 Interface Circuit Pack Maintenance documentation provides a strategy for maintaining the UDS1 Interface circuit pack. The maintenance strategy deals with logging the in-line errors reported by the UDS1 Interface circuit pack, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms.

The TN464B and TN464C circuit packs support Tie trunks, CO trunks, DID trunks, OPS lines, narrowband access endpoint ports, the ISDN-PRI signaling channel (D-channel), and ISDN-PRI trunks (B-channels). The TN464C circuit pack can also support wideband access endpoint ports and PRI endpoint ports (B-channels).

The signaling (that is, the call setup) for the Tie trunks, CO trunks, DID trunks and OPS lines is done on the circuit pack by the UDS1 firmware. Signaling for the B-channels (ISDN-PRI trunks and PRI endpoint ports) is routed over the D-channel. ISDN-PRI Trunk and PRI endpoint port signaling (Q.921, Q.931), however, is not provided by the UDS1 Interface circuit pack. For the MIPS version of D92, the system software generates and/or receives the actual ISDN-PRI signaling messages (Q.931). The system software sends and/or receives these ISDN-PRI messages via the TN1655 Packet Interface circuit pack. The Packet Interface circuit pack, in turn, communicates with the UDS1 circuit pack's D-channel via the Packet Bus. For the INTEL version of D92, the system software generates and/or receives the actual ISDN-PRI signaling messages (Q.931). The system software sends and/or receives these ISDN-PRI messages via the TN765 Processor Interface circuit pack. The Processor Interface circuit pack, in turn, communicates with the UDS1 circuit pack's D-channel via the TDM Bus.

The signaling over the DS1 link must be synchronized between the transmitting end and the receiving end to ensure error-free communication. Refer to SYNC (Synchronization) Maintenance documentation for details.

Each trunk, line, and port has its own maintenance strategy. However, each trunk, line, or port is dependent upon the health of the UDS1 Interface circuit pack. Refer to the following sections for details: TIE-DS1 documentation for a DS1 Tie Trunk, CO-DS1 documentation for a DS1 CO Trunk, DID-DS1 documentation for a DS1 DID Trunk, OPS-LINE documentation for a DS1 OPS Line, WAE-PORT documentation for a Wideband Access Endpoint, ISDN-TRK documentation for a DS1 ISDN Trunk, PE-BCHL documentation for a PRI Endpoint Port, and ISDN-LNK documentation for an ISDN-PRI Signaling Link Port.

The maintenance strategy for the TN464 UDS1 Interface circuit pack (UDS1-BD) is very similar to the maintenance strategy for the TN767 DS1 Interface circuit pack (DS1-BD). The same commands are used for administering and testing the boards. The differences in maintenance strategy between the boards are due to the UDS1 circuit pack's direct interface to the Packet Bus which is used for ISDN-PRI signaling (ISDN-LNK). While both the TN464 and TN767 can support ISDN-PRI B-channels, ISDN-PRI D-channel signaling applications require a TN464 UDS1 circuit pack.

The TN464F (or later suffix) circuit pack combined with AT&T's new 120A1 CSU Module forms an Enhanced Integrated CSU. The new 120A1 CSU Module, when combined with the functionality provided by the TN464F hardware and firmware, and new switch software, provides functionality equivalent to an external stand-alone AT&T ESF T1 CSU. The 120A1 CSU Module connects to the TN464F circuit pack on the I/O connector panel on the back of the port carrier. The new CSU Module, thus becomes an integrated part of the DEFINITY. system. Throughout the document, the term 120A1 will mean a 120A1 or later suffix CSU Module.

The Enhanced Integrated CSU is for use in the United States of America with 1.544 Mbps DS1 service. For further details on the 120A1 CSU Module see *DEFINITY. Communications System Generic 1, Generic 2, and Generic 3 V1 and V2 - Integrated CSU Module Installation and Operation*, 555-230-193, Issue 1, December 1993.

The TN464F and 120A1 CSU Module support on-demand loopback tests that assist in the detection of faults between the TN464F circuit pack and the CSU Module, between the Integrated CSU and the optional Customer Premises

Loopback Jack, or between the Integrated CSU and remote CSU. These loopback tests are explained in detail later in this UDS1-BD section, but Figure 11-102 gives a high level overview of the loopback points.

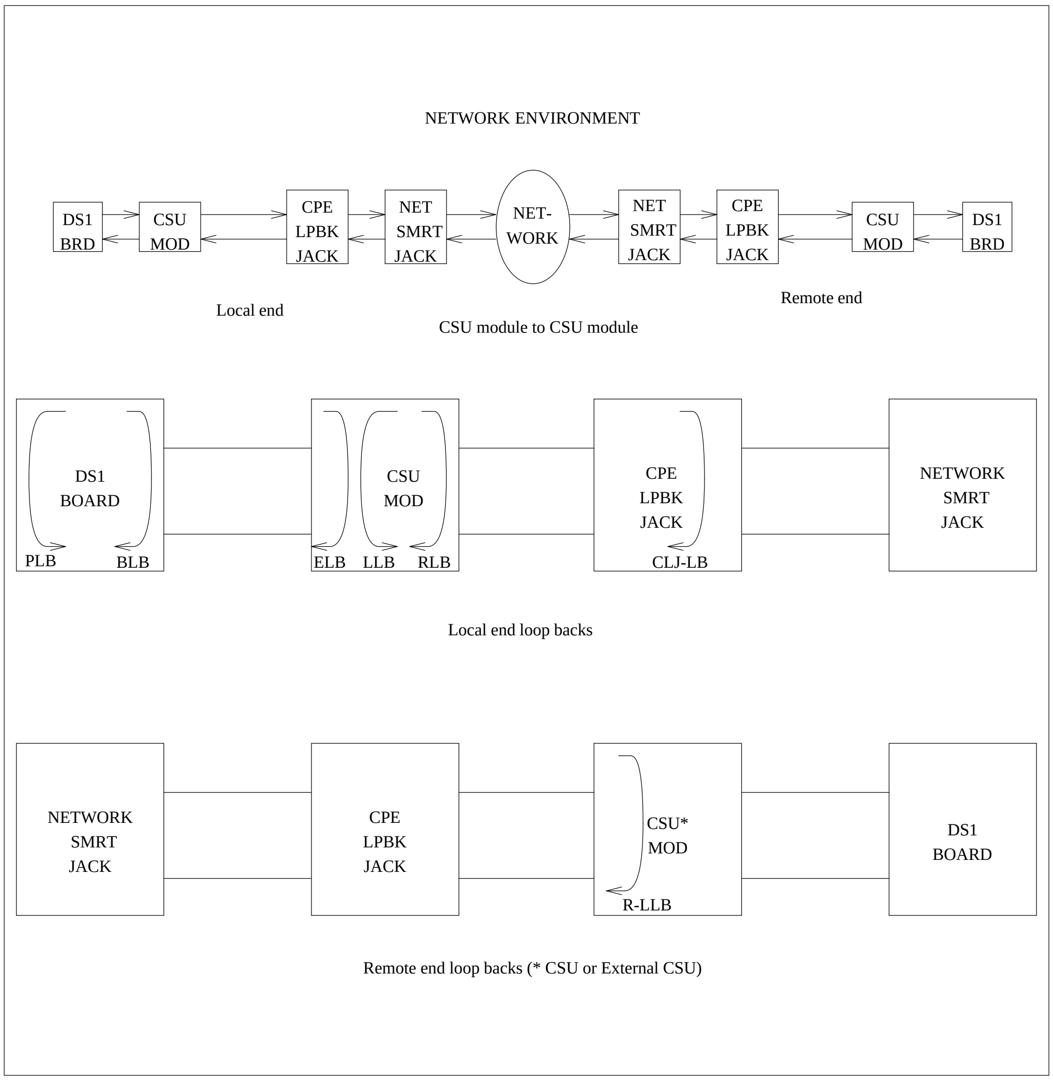

Figure 11-102. High Level Overview Of Loopback Points

Circuit Pack Administration and Options

The DS1 configuration for each circuit pack is administered on the DS1 Circuit Pack form. *Bit Rate* is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. *Country Protocol* is used to drive layer 3 protocol decisions based on PRI specifications specific to a given country (not those related to specific features). This Country Protocol is independent of the *Country* parameter administered on the country-options system-parameters form. Different UDS1 circuit packs may be administered with different Country Protocols, allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations (for example, between two different countries). US systems use country protocol 1. *Near-End CSU Type* is set to *other* for no CSU installed, *or* for an external CSU such as an AT&T ESF T1 CSU, or *integrated* for the 120A1 CSU Module. Answering *integrated* will cause additional fields to be displayed for administering the Enhanced Integrated CSU Module. In addition to the above there are numerous other fields defining such parameters as framing modes, line coding companding mode and so on. For details, see *DEFINITY Communications System Generic 3 V2 Implementation,* 555-230-653, and *DEFINITY Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT/ISDN-PRI Reference*, 555-025-107.

Figure 11-103 through Figure 11-105 show how to configure the circuit pack for 24-channel or 32-channel DS1. The channel selection must match the parameters administered on the corresponding DS1 Circuit Pack Form. (US applications use 24 Channels.)

The channel selection must match the parameters administered on the corresponding DS1 Circuit Pack Form. (US applications use 24 Channels.)

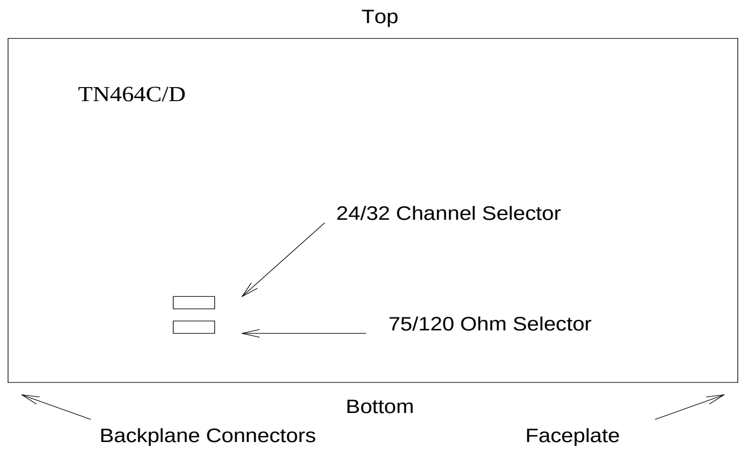

Figure 11-103. TN464C/D DS1 Option Jumpers

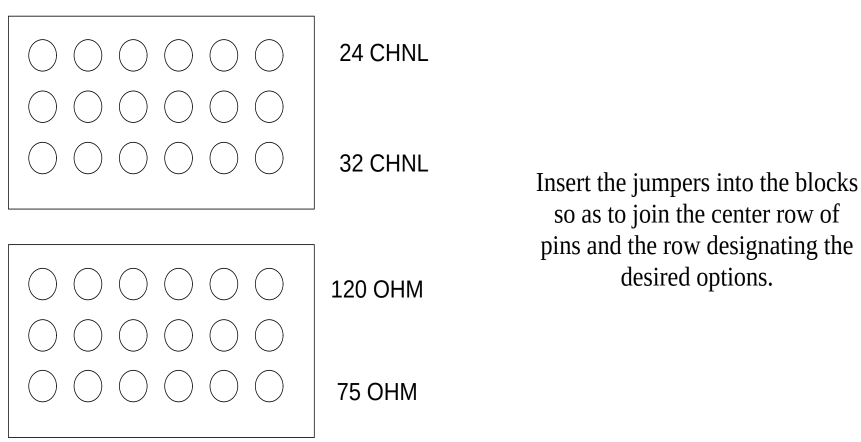

Figure 11-104. TN464C/D DS1 Option Jumpers

The option switch located on the component side of the TN464E/F circuit pack must be set correctly. Figure 11-105 shows how to configure the circuit pack for 24-channel or 32-channel DS1. The channel selection must match the parameters administered on the corresponding DS1 Circuit Pack Form. (US applications use 24 Channels.)

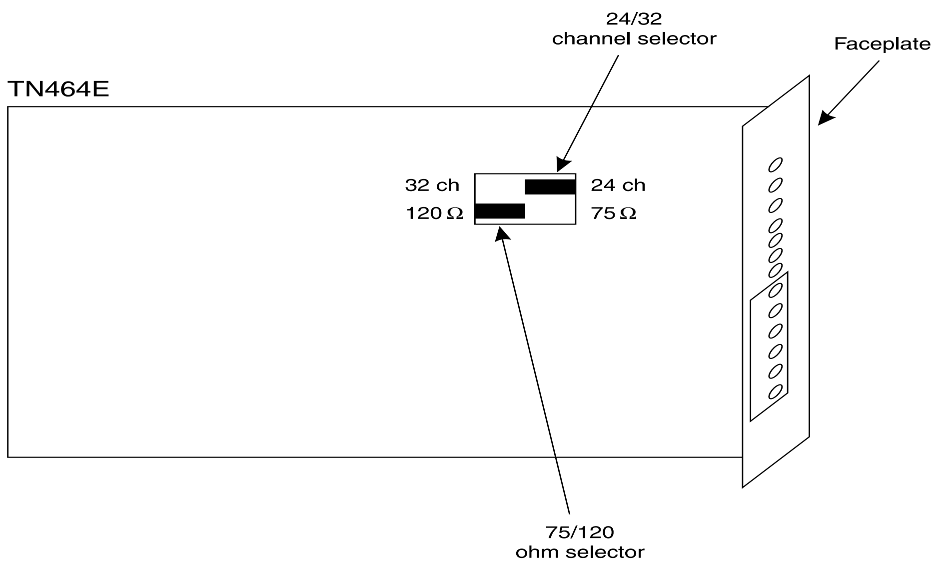

Figure 11-105. TN464E/F DS1 Option switches

Hardware Error Log Entries and Test to Clear Values

Table 11-375. DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS
1(a)	0	Circuit pack removed or SAKI Test (#53)	MIN/ WRN[2]	ON	
18(b)	0	busyout board PCSS	WARNING	OFF	release board PCSS
23(c)	0		WARNING	OFF	add ds1 PCSS
125(d)	none	None	MIN/ WRN[3]	ON	
257	65535	Control Channel Loop Test (#52)	MINOR	ON	test board PCSS l r 20
257(e)	Any	None			
513(f)	Any		MIN/ WRN[3]	ON	
514(g)	46086		MIN/ WRN[3]	ON	
769(h)	46085		MIN/ WRN[3]	ON	
770(i)	46096		MIN/ WRN[3]	ON	
1025(e)	4363	NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN /WRN[3]	OFF	test board PCSS
1300(j)	Any	Loss Of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1301(k)	Any	Loss Of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1302(l)	Any	Loss Of Signal Alarm Inquiry Test (#138)	MIN/ WRN[3]	OFF	test board PCSS

Continued on next page

Table 11-375. DS1 Interface Circuit Pack Maintenance Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1303(m)	Any	Loss Of Signal Alarm Inquiry Test (#138)	MIN/ WRN[3]	ON	test board PCSS
1310(n)	Any	Board Loopback Test (#1209)	MINOR	ON	test ds1-loop PCSS ds1/csu-loopback-tests
1311(o)	Any	Equipment Loopback Test (#1210)	MIN/ WRN[3]	OFF	test ds1-loop PCSS ds1/csu-loopback-tests
1312(p)	Any	Repeater Loopback Test (#1211)	MIN/ WRN[3]	OFF	test ds1-loop PCSS ds1/csu-loopback-tests
1313(q)	Any	CPE Loopback Jack Test (#1212)	MIN/ WRN[3]	OFF	test ds1-loop PCSS end-loopback/span-test
1314(r)	Any	Far CSU Loopback Test (#1213)	MIN/ WRN[3]	OFF	test ds1-loop PCSS end-loopback/span-
1320	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/ WRN[3]	OFF	test board PCSS
1321	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/ WRN[3]	OFF	test board PCSS
1322	Any	Loss of Signal Alarm Inquiry Test (#138)	MINOR	ON	test board PCSS
1323	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/ WRN[3]	OFF	test board PCSS
1324	Any	Loss of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board PCSS
1537(s)	46082		MIN/ WRN[3]	ON	
1538(t)	Any		MIN/ WRN[3]	ON	

Continued on next page

Table 11-375. DS1 Interface Circuit Pack Maintenance Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1793	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN[4]	OFF	test board PCSS
1794	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN[4]	OFF	test board PCSS
1795	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN/ WRN[4]	OFF	test board PCSS
2049	Any	Red Alarm Inquiry Test (#140)	MIN/ WRN[3]	OFF	test board PCSS
2305	Any	Yellow Alarm Inquiry Test (#141)	MIN/ WRN[3]	OFF	test board PCSS
2306 (u)	Any	Yellow Alarm Inquiry Test (#141)	MIN /WRN[3]	OFF	test Board PCSS
2561	Any	Major Alarm Inquiry Test (#142)	MIN /WRN[3]	OFF	test board PCSS
2817		Minor Alarm Inquiry Test (#143)	MIN/ WRN[3]	OFF	test board PCSS
3073 to 3160 (v)	Any	Slip Alarm Inquiry Test (#144)	MIN/ WRN[3]	OFF	test board PCSS r 6
3330(w)	46083		MIN/ WRN[3]	ON	
3585 to 3601 (x)	Any	Misframe Alarm Inquiry Test (#145)	MIN/ WRN[3]	OFF	test board PCSS r 6
3840(y)	Any	None			
3841(z)	4358				
3842(aa)	46097				
3843(ab)	46081				

Continued on next page

Table 11-375. DS1 Interface Circuit Pack Maintenance Error Log Entries — *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3900(ac)	Any	CPE Loopback Jack Test (#1212)			
3901(ad)	Any	Far CSU Loopback Test (#1213)			
3902(ae)	Any	One-Way Span Test (#1214)			
3999(af)	Any	None			

Continued on next page

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

3 Minor alarms on this MO may be downgraded to warning alarms based on values set in the **set options** command.

4 Major alarms on this MO may be downgraded to minor or warning alarms based on values set in the **set options** command.

Notes:

a. Error 1 indicates that the circuit pack has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI Test (#53) fails.

To be fully administered, a UDS1 circuit pack must meet all of these 3 conditions:

1. Have an entry in the circuit plan via the **change circuit pack** command
2. Be administered via the **add ds1** PCSS command
3. Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit plan and either of the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error either

1. Make sure all conditions for administration are met and that a functioning UDS1 circuit pack is inserted in the correct slot, or
2. Completely remove the UDS1-BD from the system using the following steps:
   a. Remove any administered DS1 trunks, access endpoints or PRI endpoints associated with the circuit pack from their trunk groups.
   b. Execute the **remove ds1** PCSS and **change circuit pack** PCSS commands.

If all the administration conditions are met for this circuit pack and the red LED is still on, follow the instructions for LED Alarms with Error Type 1 in Chapter 7, "LED Interpretation".

b. The UDS1 Interface circuit pack has been busied out by a **busyout board PCSS** command.

c. The UDS1-BD circuit pack is not completely administered. To be fully administered, the UDS1 circuit pack must:
   1. Have an entry in the circuit plan via the **change circuit pack** command,
   2. Be administered via the **add ds1** PCSS command, and
   3. Be physically inserted into the correct slot.

   A DS1 (UDS1-BD and DS1-BD) differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered with the **add ds1** command.

d. No Aux Data: A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

   Aux Data 3: The 24/32-channel option jumper setting on the circuit pack does not match the option set on the DS1 circuit pack administration form. The circuit pack must be physically removed to see the setting of the jumper.

e. This error is associated with the Common Port Circuit Pack Maintenance Test. Refer to XXX-BD (Common Port Circuit Pack) Maintenance documentation for details.

f. The UDS1 Interface circuit pack has detected a transient hardware problem. The value in the Aux Data field indicates the type of hardware problem.

4352	External RAM failure
4353	Internal RAM failure
4355	Internal ROM failure

If the UDS1 board detects only one of these hardware problems, then the error will disappear when none of these faults are detected for 10 minutes. If the same Aux Data value is logged more than once in a 24 hour period, the circuit pack should be replaced.

g. LAN External RAM Error. This error occurs when there is a hardware fault in the PPE external RAM. The RAM is used for message buffering to and from the Packet Bus. This error should not occur regularly. If this error is seen quite frequently (10 times within 30 minutes), the circuit pack should be replaced.

h. Transmit FIFO Underflow Error. This error occurs when the circuit pack cannot find the "end of frame" bit when transmitting a frame to Packet Bus. An alarm will be raised if this error occurs three times within 10 minutes. Clear the alarm via the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS long**, **release board PCSS**. If the error recurs within 10 minutes, then replace the circuit pack.

i. Unable to Write LAN Translation RAM Error. This error occurs when a call is aborted because there are no available translation RAM locations for the call connection attempt. An alarm will be raised if this error occurs two times within 10 minutes. Clear the alarm via the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS long**, **release board PCSS**. If the error recurs within 10 minutes, then replace the circuit pack.

j. CSU Module missing. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the 120A1 CSU Module is not physically connected (or is improperly connected) to the TN464F board on the back of the port carrier.

   If using the 120A1 CSU Module, plug (or replug) the CSU Module into the TN464F circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the *Near-End CSU Type* field using the *change ds1* form to *other*.

   If this error remains after plugging the CSU Module into the board's connector, there could be a problem with the I/O connector panel.

k. CSU Module not expected. The 120A1 CSU Module is physically connected to the TN464F board on the back of the port carrier but the *Near-End CSU Type* field on the *add ds1* form has not been administered as *integrated*.

   If the 120A1 CSU Module is to be used, use the *change ds1* command to change the *Near-End CSU Type* field to *integrated*. Otherwise, physically remove the 120A1 CSU Module from the back of the port carrier.

l. DS1 configuration error. Attempting to use the 120A1 CSU Module with a TN464F circuit pack that is configured for 32-channel (2.048 Mbps) operation. The CSU Module only works with a DS1 board configured for 24-channel (1.544 Mbps) operation in the United States of America.

m. DS1 circuit pack suffix incorrect for CSU Module. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the DS1 circuit pack is not a TN464F or later suffix UDS1 board.

   If the 120A1 CSU Module is to be used, remove the circuit pack and replace it with a TN464F or later suffix board. Otherwise, use the ***change ds1*** command to change the *Near-End CSU Type* field to *other*.

n. BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using the following commands: ***busyout board PCSS***, ***test ds1-loop PCSS ds1/csu-loopback-tests***, ***release board PCSS***. If the BLB test continues to fail, then the TN464F circuit pack needs to be replaced.

o. ELB failure. This error occurs when the Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test fails. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN464F board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS ds1/csu-loopback-tests*, *release board PCSS*. If the ELB test continues to fail, then either the TN464F board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate where the failure is occurring by reexecuting the test by replacing one piece of hardware at a time.

p. RLB failure. This error occurs when the Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test fails. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN464F board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS ds1/csu-loopback-tests*, *release board PCSS*. If the RLB test continues to fail, then the CSU Module needs to be replaced.

q. CPE Loopback Jack deactivation error. This error occurs when the TN464F circuit pack could not deactivate a CPE Loopback Jack loopback on power-up/reset or upon software request.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS end-loopback/span-test*, *release board PCSS*. If the attempt to deactivate the CPE Loopback Jack loopback continues to fail, other steps must be taken to deactivate the loopback.

r. Far CSU Loopback deactivation error. This error occurs when the TN464F circuit pack could not deactivate a far-end CSU loopback on power-up/reset or upon software request.

   Attempt to clear the alarm via the following commands: *busyout board PCSS*, *test ds1-loop PCSS end-loopback/span-test*, *release board PCSS*. If the attempt to deactivate the Far CSU loopback continues to fail, then escalate the problem.

s. LAN Bus Timeout Error. This error occurs when the circuit pack transmits too many bytes on the LAN bus for a single frame. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those maintenance objects.

   If the error occurs three times within 10 minutes, the board will be isolated from the Packet Bus and the board will be alarmed. To clear the alarm and restore the board to the Packet Bus, use the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS long**, **release board PCSS**.

   If the problem persists, and there are no PKT-BUS alarms or port alarms, then replace the circuit pack.

t. The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The common circuit pack level tests such as Test #50 and/or Test #52 are aborting with error code 2000.
   2. The tests run on the ports of this circuit pack are returning with a NO-BOARD.
   3. A busyout/release of the circuit pack has no affect on test results.
   4. A **list configuration** command shows that the circuit pack and ports are properly installed.

   The circuit pack is isolated from the system and all trunks or ports on this circuit pack are placed into the out-of-service state. The system will try to restore the circuit pack within 20-30 minutes. When no faults are detected for 20-30 minutes, the UDS1 Interface circuit pack is restored to normal operation. All trunks or ports of the UDS1 Interface circuit pack are then returned to the in-service state. If the board is not restored to normal operation, or the error recurs after the board was restored to normal operation, escalate the problem.

u. LAN Critical Error. A critical failure has been detected in the Packet Bus interface of the circuit pack. This failure may be due to an on-board fault or a Packet Bus fault. If the Packet Bus is alarmed, refer to the PKT-BUS Maintenance documentation for recommended repair procedures.

This error will isolate the board from the Packet Bus and raise an alarm. If the Packet Bus is not alarmed, enter the following commands: **busyout board PCSS**, **reset board PCSS**, **test board PCSS**, **release board PCSS**. This should clear the alarm and restore the board to the Packet Bus.

If the problem persists, and there are no PKT-BUS alarms, then replace the circuit pack.

v. For later releases of G3V4 and beyond, only error 3073 will show that this board is receiving slips and the AUX data shows the last slip count that was reported.

w. These errors are not service-affecting. No action is required. These errors are reported by the circuit pack when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link

x. For later releases of G3V4 and beyond, only error 3585 will show that this board is receiving misframes and the AUX data shows the last misframe count that was reported.

y. The UDS1 Interface circuit pack has detected a transient hardware logic error (for example, program logic inconsistency). This error will disappear when no faults are detected for 100 minutes. The value in Aux Data field indicates the type of hardware problem.

z. Bad Translation RAM Location Found Error. This error is not service-affecting. No action is required. A Bad Translation RAM is detected, but the call continues by using another translation location.

aa. LAN Receive Parity Error. This error occurs when the circuit pack detects an error in a received frame from the Packet Bus. These errors are most likely caused by a Packet Bus problem, but may be due to a circuit pack fault.

Refer to the PKT-BUS Maintenance documentation to determine if the problem is isolated to this circuit pack or if the problem is caused by Packet Bus faults.

ab. Error 3900 is used to give status information on a CPE Loopback Jack Test. The value in the Aux Data field indicates the status of the loopback test.

1 — Test is currently running.

2 — Test failed because loopback could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been terminated.

ac. Error 3901 is used to give status information on a Far CSU Loopback Test. The value in the Aux Data field indicates the status of the loopback test.

1 — Test is currently running.

2 — Test failed because loopback could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been terminated.

ad. Error 3902 is used to give status information on a One-Way Span Test. The value in the Aux Data field indicates the status of the span test.

1 — Test is currently running.

2 — Test has failed because test could not be activated.

3 — Test pattern was not received from the far end.

4 — Test has been terminated.

ae. Error type 3999 indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Connection Audit Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Table 11-376. System Technician-Demanded Tests: Descriptions and Error Codes

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
NPE Connection Audit Test (#50)		X			ND
Control Channel Loop Test (#52)		X			ND
Loss of Signal Alarm Inquiry Test (#138)	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND
Misframe Alarm Inquiry Test (#145)	X	X			ND
Translation Update Test (#146)	X	X			ND
ICSU Status LEDs Test (#1227)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Loop Around Test (#135)			X		D

Continued on next page

Table 11-376. System Technician-Demanded Tests: Descriptions and Error Codes — *Continued*

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
DS1/CSU Loopback Tests					
DS1 Board Loopback Test (#1209)				X	D
CSU Equipment Loopback Test (#1210)				X	D
CSU Repeater Loopback Test (#1211)				X	D
CPE Loopback Jack Test (#1212)				X	D
Far CSU Loopback Test (#1213)				X	D
One-Way Span Test (#1214)				X	D
Inject Single Bit Error (#1215)				X	D
End Loopback/Span Test (#1216)				X	D

1 D = Destructive; ND = Nondestructive

NPE Connection Audit Test (#50)

The system sends a message to the on-board microprocessor to update the network connectivity translation for the SCOTCH-NPE chip on the circuit pack.

Table 11-377. TEST #50 NPE Connection Audit Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1019	ABORT	The test aborted because a test was already running on the port. 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort/fail, escalate the problem.
	PASS	The circuit pack's SCOTCH-NPE chip have been updated with its translation.

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Table 11-377. TEST #50 NPE Connection Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Control Channel Loop Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 11-378. TEST #52 Control Channel Loop Around Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	The circuit pack failed to return the circuit pack code or vintage. 1. Retry the command a maximum of 5 times. 2. If the problem continues, and if the circuit pack is one of the Port circuit packs, replace the circuit pack. Otherwise, if the circuit pack is part of the SPE, use the procedure described in "Replacing Defective SPE Circuit Packs" in Chapter 8, "Reliability Systems: A Maintenance Aid". 3. Retry the command a few times a maximum of 5 times. 4. If the test continues to fail, escalate the problem.
	PASS	Communication with this circuit pack is successful.

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Table 11-378. TEST #52 Control Channel Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

SAKI Sanity Test (#53)

This test is destructive.

This test resets the circuit pack. The test is highly destructive and can only be initiated by a system technician-demanded **reset board PCSS** command.

Table 11-379. TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	System resources required for this test are not available. 1. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Wrong circuit pack configuration to run this test. This error applies only to DS1 Interface circuit packs. It means the DS1 Interface circuit pack is providing timing for the system and, therefore, it cannot be reset without major system disruptions. 1. If the circuit pack needs to be reset, then set synchronization to another DS1 Interface circuit pack or to the Tone-Clock circuit pack and try again. Refer to SYNC (Synchronization) Maintenance documentation.
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack. 2. Execute the **reset board** command again. 3. If the test aborts with this error code again, escalate the problem.
2100	ABORT	System resources required for this test are not available. 1. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. 1. Execute the **reset board** command again. 2. If the problem persists, replace the circuit pack.

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Table 11-379. TEST #53 SAKI Sanity Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The circuit pack initializes correctly. 1. Run the Short Test Sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Internal Loop Around Test (#135)

This test is destructive.

The Internal Loop Around Test is run by looping the transmitted DS1 bit stream back into the UDS1's board receiver. The loop occurs just before the DS1 facility interface. The test is highly destructive and can only be initiated by a system technician-demanded **reset board PCSS** command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Internal Loop Around Test. When the Internal Loop Around Test is initiated, maintenance software sends appropriate messages to the UDS1 Interface circuit pack to start the test. The test uses the Tone Generator and Tone Detector to exercise a bit pattern consistency test for all ports. If the transmitted and received bit patterns on a trunk or port are different, the test fails.

When the test is complete, the maintenance software sends a stop loop around message to the UDS1 Interface circuit pack to put the circuit pack back into the normal operation mode. All trunks or ports of the UDS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-380. TEST #135 Internal Loop Around Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal System Error 1. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-380. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. 1. Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) Maintenance documentation. 3. If neither condition exists, retry the **reset board** command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	Received an incoming call on a port of the UDS1 circuit pack during the test. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack to out-of-service state. 2. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 3. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the **reset board** command. 3. If the test continues to abort, escalate the problem.

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Table 11-380. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this error type.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the **reset board** command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-380. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The UDS1 Interface circuit pack failed in the Internal Loop Around Test. If the UDS1 connects to a T1 network facility or another switch: 1. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 2. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the physical connectivity of DS1 Interface circuit packs and cable. 5. Replace the local UDS1 Interface circuit pack and repeat the test. 6. Contact T1 Network Service to diagnose the remote DS1 endpoint. 7. If the test still fails, then escalate the problem. *More information continues on the next page.*

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Table 11-380. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: 1. Retry the **reset board** command at 1-minute intervals a maximum of 5 times. 2. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 4. Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the line-side terminating device operating manual for information. 5. Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. If the error seconds measurement is severe, investigate premise distribution system wiring for noise and distance limitation. 6. Replace the local UDS1 Interface circuit pack and repeat the test. 7. Contact the vendor of the line-side terminating device to diagnose the equipment. 8. If the test still fails, then escalate the problem.
	PASS	All administered trunks or ports of the UDS1 Interface circuit pack pass the Internal Loop Around Test. The bit pattern consistency test is executed successfully over the path that covers a DS1 port, cable, and the external NCTE device.

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Table 11-380. TEST #135 Internal Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Loss of Signal Alarm Inquiry Test (#138)

This test verifies the synchronization status and continuity of the DS1 link. The Loss of Signal alarm indicates that the UDS1 Interface circuit pack is unable to derive the synchronization clock from the DS1 facility. When the UDS1 Interface circuit pack detects a Loss of Signal alarm, it stops providing the synchronization clock for the system if it is administered as a timing source and transmits a Yellow alarm to the remote DS1 endpoint.

When the Loss of Signal alarm is confirmed, the maintenance software places all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored.

The UDS1 Interface circuit pack raises a Loss of Signal alarm after the signal has been lost for about 3 seconds. It will not retire the alarm until the signal has returned for about 10 seconds.

This test is also used to maintain the new AT&T 120A1 CSU Module. This CSU Module, when combined with the functionality provided by the TN464F circuit pack, provides functionality equivalent to an external stand-alone AT&T ESF T1 CSU. The combination of the TN464F and 120A1 CSU Module is known as an Enhanced Integrated CSU (I-CSU).

If a TN464F circuit pack detects certain I-CSU hardware errors, it will notify maintenance. When the maintenance subsystem receives notification of the I-CSU error, it will execute this Loss of Signal Inquiry test. The test, in addition to querying for a Loss Of Signal alarm condition, will also query the TN464F board to confirm the I-CSU error. A Minor or Warning alarm will be raised depending on the severity of the I-CSU error. The trunks on the board may be taken out of service if the I-CSU error is deemed serious.

If a Loss Of Signal alarm and an I-CSU error co-exist, the Loss Of Signal alarm condition will take priority and the board and all trunks on the board will be put in the out-of-service state. Errors will be logged, however, for both.

When the maintenance subsystem receives notification that the I-CSU hardware error condition no longer exists, maintenance will restore the board and all trunks to their previous service state if the alarm can be cleared (no other I-CSU errors or Loss Of Signal alarm exist).

Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	UDS1 Interface circuit pack detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. All trunks or ports of this UDS1 interface circuit pack are out-of-service. If the UDS1 Interface circuit pack is designated as the supplier of the system synchronization source, then the system synchronization maintenance will adopt a source elsewhere. Refer to the SYNC section in this chapter for details. If the UDS1 connects to a T1 network facility: 1. Check the physical connection of the UDS1 Interface circuit pack and the cable. If a 120A1 CSU Module is physically connected to a TN464F board on the back of the port carrier, check the physical connection of the CSU Module and make sure the Network Interface cable is plugged into the CSU Module's NETWORK jack. 2. If the UDS1 Interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 Interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: 1. Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. If a 120A1 CSU Module is physically connected to a TN464F board on the back of the port carrier, check the physical connection of the CSU Module and make sure the Network Interface cable is plugged into the CSU Module's NETWORK jack. 2. Contact the vendor of the line-side terminating device to diagnose the equipment.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1300		The CSU Module is missing. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the 120A1 CSU Module is not physically connected to the TN464F board on the back of the port carrier. 1. If using the 120A1 CSU Module, plug the CSU Module into the TN464F circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the *Near-End CSU Type* field using the *change ds1* form to *other*. 2. Run the test again.
1301	FAIL	The 120A1 CSU Module is physically connected to the TN464F board on the back of the port carrier but the *Near-End CSU Type* field on the *add ds1* form has not been administered as *integrated*. 1. If the 120A1 CSU Module is to be used, use the *change ds1* command to change the *Near-End CSU Type* field to *integrated*. Otherwise, physically remove the 120A1 CSU Module from the back of the port carrier. 2. Run the test again.
1302	FAIL	Attempting to use the 120A1 CSU Module with a TN464F circuit pack that is configured for 32-channel (2.048 Mbps) operation. The CSU Module only works with a DS1 board configured for 24-channel (1.544 Mbps) operation in the United States of America. 1. If the 120A1 CSU Module is to be used, physically remove the TN464F circuit pack and reconfigure for 24-channel (1.544 Mbps) operation. 2. Reinsert the circuit pack and run the test again.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1303	FAIL	The DS1 circuit pack Suffix is incorrect for CSU Module administration. The *Near-End CSU Type* field on the *add ds1* form has been administered as *integrated* but the DS1 circuit pack is not a TN464F or later suffix UDS1 board. 1. If the CSU Module is to be used, and the *Near-End CSU* type field is set to *intergrated* to allow for CSU Module administration, remove the circuit pack and replace with a TN464F or later suffix board. Otherwise, use the ***change ds1*** command to change the *Near-End CSU Type* field to *other*.
1310	FAIL	The DS1 Board Loopback (BLB) demand test (#1209) failed. 1. Repeat the test using the ***test ds1-loop PCSS ds1/csu-loopback-tests*** command. 2. If the BLB test continues to fail, then replace the TN464F circuit pack. 3) Run this test again.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1311	FAIL	The Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test (#1210) failed. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN464F board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*. 1. Execute the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the ELB test continues to fail, then either the TN464F board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Begin by replacing the CSU Module and running the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 3. If the ELB test continues to fail, then replace the TN464F board and run the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 4. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module.
1312	FAIL	The Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test (#1211) failed. This test is executed by the I-CSU during I-CSU power-up/reset (i.e.- TN464F board physically inserted and 120A1 CSU Module already installed) or when the 120A1 CSU Module is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command *test ds1-loop PCSS ds1/csu-loopback-tests*. 1. Execute the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the RLB test continues to fail, then replace the CSU Module. 3. Run this test again.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1313	FAIL	The TN464F circuit pack could not deactivate a CPE Loopback Jack loopback. 1. Execute the ***test ds1-loop PCSS end-loopback/span-test*** command. 2. If the attempt to deactivate the CPE Loopback Jack loopback is not successful, check the cabling and investigate the problem at the CPE Loopback Jack. 3. Run the test again.
1314	FAIL	The TN464F circuit pack could not deactivate a far-end CSU loopback. 1. Execute the *test ds1-loop PCSS end-loopback/span-test* command. 2. If the attempt to deactivate the far-end CSU loopback continues to fail, then escalate the problem.
1320	FAIL	A 120A1 CSU module hardware failure or an ICSU serial interface audit failure was detected by the TN464F UDS1 circuit pack. 1. Replace the CSU module, and then run the test again. 2. If the test continues to fail with this error code, replace the TN464F and run the test again. 3. If the test continues to fail with this error code, then the problem could be in the I/O cable between the backplane and the CSU module.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1321	FAIL	DTE LOS (loss of signal) was detected between the TN464F UDS1 board and the 120A1 CSU Module. Either the TN464F board, the 120A1 CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. 1. Replace the CSU Module and run the test again. 2. If the test continues to fail with this error code, then replace the TN464F board and run the test again. 3. If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module.
1322	FAIL	No 5 volts power detected from the TN464F circuit pack to the 120A1 CSU Module. Problem probably due to an open fuse on the DS1 board or a faulty ICSU. **NOTE:** Do not immediately swap DS1 boards as this may blow the fuse on the new board. 1. If the test continues to fail with this error code, then replace the CSU Module and run the test again. 2. Remove the TN464F from the system and reinsert. 3. Run the test again once the board has finished its reset. 4. If the test continues to fail with this error code, then replace the TN464F board and run the test again. 5. If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module.
1323	FAIL	A service affecting CSU Module audit failure was detected by the TN464F UDS1 circuit pack. All administered ports on the UDS1 circuit pack are affected and maintenance software will place the ports into the out-of-service state. 1. Replace the 120A1 CSU Module.

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Table 11-381. TEST #138 Loss of Signal Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1324	FAIL	A non-service affecting CSU Module audit failure was detected by the TN464F UDS1 circuit pack. No ports should be affected. No immediate action is required. These errors indicate that the CSU Module hardware may have a problem, and that it should be replaced when practical to avoid further deterioration.
	PASS	DS1 signal is present and the physical link is healthy. In addition, no Integrated CSU errors are detected.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Blue Alarm Inquiry Test (#139)

The Blue Alarm is a signal sent by the remote DS1 endpoint when it is out-of-service. The Blue Alarm Inquiry Test checks the blue alarm status of the remote DS1 endpoint.

When the UDS1 Interface circuit pack detects a Blue Alarm signal from the remote DS1 endpoint, the circuit pack will transmit a Yellow alarm to the remote DS1 endpoint and send a BLUE ALARM message to the maintenance software. When the Blue alarm is confirmed, the maintenance software places all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. The inquiry test will be run every 10 minutes until the Blue alarm is cleared.

The UDS1 Interface circuit pack takes 3 seconds to recognize and report a Blue alarm and 16 seconds to recognize and report the resolution of a Blue alarm. When the Blue alarm is cleared, the UDS1 Interface circuit pack stops transmitting the Yellow alarm and places the trunks or ports back into the service state before the Blue alarm occurs.

Line Loopback Alarm

The Line Loopback (LLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. When the switch DS1 is in the LLB mode, the arriving bit pattern is regenerated and sent back. Line Loopback (LLB) Alarm is activated when the in-band activate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line. LLB is deactivated when the in-band deactivate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line.

Since LLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Payload Loopback Alarm

The Payload Loopback (PLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. PLB Alarm is activated when a network protocol activate bit pattern arrives over the 4Kbps ESF data link on the DS1 line. PLB is deactivated when a network protocol deactivate bit pattern arrives over the 4Kbps ESF data link on the DS1 line.

Since PLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Table 11-382. TEST #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-382. TEST #139 Blue Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The remote DS1 endpoint is out-of-service.
1 1794	FAIL	The UDS1 Interface circuit pack detects a Line Loopback Alarm (LLB). If the UDS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 interface circuit pack connects directly to a line-side terminating device (for example, a PRI terminal adapter), call the vendor of the terminating device to diagnose the equipment.
1795	FAIL	The UDS1 Interface circuit pack detects a Payload Loopback Alarm (PLB). If the UDS1 Interface circuit pack connects to a leased T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 Interface circuit pack connects directly to another DS1 board, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 Interface circuit pack connects directly to a line-side terminating device such as a PRI terminal adapter contact the vendor of the terminating device to diagnose the equipment.
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback alarm is detected by the UDS1 Interface circuit pack.

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Table 11-382. TEST #139 Blue Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Red Alarm Inquiry Test (#140)

A UDS1 Interface circuit pack raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry Test checks the framing status of a UDS1 Interface circuit pack. A UDS1 Interface circuit pack takes 3 seconds to recognize and report a Red alarm and 10 seconds to recognize and report the resolution of a Red alarm.

When the UDS1 Interface circuit pack detects a Red alarm, the circuit pack will transmit a Yellow alarm to the remote DS1 endpoint and send a RED ALARM message to the maintenance software. After the Red alarm is confirmed, the maintenance software places all trunks or ports of the circuit pack into the out-of-service state. The inquiry test will be run every 10 minutes until the Red alarm is cleared.

When the Red alarm is cleared, the UDS1 Interface circuit pack will stop transmitting the Yellow alarm to the remote DS1 endpoint. The maintenance software restores all trunks or ports of the UDS1 Interface circuit pack to the service state before the Red alarm occurs.

Loss of Multiframe Alarm

If the UDS1 Interface circuit pack is administered using DMI-BOS signaling, the UDS1 Interface circuit pack raises a Loss of Multiframe Alarm (LMA) when it cannot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24th channel. Once the UDS1 Interface circuit pack detects an LMA, the circuit pack will transmit a Remote Multiframe Alarm (RMA) to the remote DS1 endpoint. Maintenance software handles both Red alarm and LMA alarm(s) using the same mechanism.

Table 11-383. TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-383. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A 'busyout' or a 'release' command has no affect on the test results. 4. A 'list config' command shows that the circuit pack and the ports are properly installed. **NOTE:** When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-383. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The UDS1 interface circuit pack detected a red alarm. An out of frame condition occurred on the UDS1 interface circuit pack. The UDS1 interface circuit pack will transmit a yellow alarm to the remote UDS1 endpoint until the red alarm is retired. If the UDS1 connects to a T1 network facility or to another switch, do the following. 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 2. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. 3. Check the physical connectivity of the UDS1 packs and of the cable. 4. Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. 1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 3. Contact the vendor of the line-side terminating device to diagnose the equipment. 4. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 5. Replace the local UDS1 interface circuit pack and repeat the test.

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Table 11-383. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The UDS1 interface circuit pack detected a loss of multiframe alarm (LMA). An out of frame condition occurred on the UDS1 interface circuit pack. The UDS1 interface circuit pack will transmit a remote multiframe alarm (RMA) to the remote UDS1 endpoint until the LMA is retired. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 2. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. 3. Check the physical connectivity of the UDS1 packs and of the cable. 4. Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. 1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 3. Contact the vendor of the line-side terminating device to diagnose the equipment. 4. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 5. Replace the local UDS1 interface circuit pack and repeat the test.

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Table 11-383. TEST #140 Red Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	No Red alarm is detected on the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Yellow Alarm Inquiry Test (#141)

Receiving a Yellow alarm from remote DS1 endpoint indicates that the remote DS1 endpoint has an out-of-frame condition. The Yellow Alarm Inquiry Test is used to determine whether the remote DS1 endpoint is transmitting a Yellow alarm. The UDS1 Interface circuit pack takes 500 msec to recognize and report a Yellow alarm and 500 msec to recognize and report that a Yellow alarm condition is cleared.

When the UDS1 Interface circuit pack detects a Yellow alarm from the remote DS1 endpoint, it will send a YELLOW-ALARM uplink message to the maintenance software. After the maintenance software receives the YELLOW-ALARM message, the Yellow Alarm Inquiry Test is run to confirm the Yellow alarm. Once the Yellow alarm is confirmed, the maintenance software places all trunks or ports on the circuit pack into the out-of-service state. The Inquiry Test will be run every 10 minutes until the Yellow alarm is cleared.

When the Yellow alarm is cleared, the maintenance software restores all trunks or ports on the UDS1 Interface circuit pack back to their previous service state before the Yellow alarm was raised.

This Yellow alarm corresponds to the yellow F2 state documented in CCITT Recommendation I.431.

Remote Multiframe Alarm

Remote Multiframe Alarm (RMA) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition while the UDS1 Interface circuit pack is administered using the DMI-BOS common channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 Fault Alarm

For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

Table 11-384. TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A 'busyout' or a 'release' command has no affect on the test results. 4. A 'list config' command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 11-384. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The UDS1 interface circuit pack detected a yellow alarm sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 2. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. 3. Check the physical connectivity of the UDS1 packs and of the cable.. 4. Replace the local UDS1 interface circuit pack, and repeat the test. 5. If the test still fails, escalate the problem. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: 1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 3. Contact the vendor of the line-side terminating device to diagnose the equipment. 4. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 5. Replace the local UDS1 interface circuit pack and repeat the test. 6. f the test still fails, escalate the problem.

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Table 11-384. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1	FAIL	The UDS1 interface circuit pack detected a remote multiframe alarm (RMA) sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 2. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. 3. Check the physical connectivity of the UDS1 packs and of the cable. 4. Replace the local UDS1 interface circuit pack, and repeat the test. 5. If the test still fails, escalate the problem. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: 1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 3. Contact the vendor of the line-side terminating device to diagnose the equipment. 4. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 5. Replace the local UDS1 interface circuit pack and repeat the test. 6. If the test still fails, escalate the problem..

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Table 11-384. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The UDS1 interface circuit pack is reporting a Yellow F5 fault alarm. There is a fault in the User-Network interface from the user (PBX) to the network. An out-of-frame condition occurs on the remote DS1 endpoint. If the UDS1 connects to a T1 network facility: 1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 2. Contact T1 Network Service to diagnose the remote DS1 endpoint. 3. Check the physical connectivity of the DS1 Interface circuit packs and cable. 4. Replace the local UDS1 Interface circuit pack and repeat the test. 5. If the test still fails, then escalate the problem. If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: 1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 3. Contact the vendor of the line-side terminating device to diagnose the equipment. 4. Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. 5. Replace the local UDS1 Interface circuit pack and repeat the test. 6. If the test still fails, then escalate the problem.

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Table 11-384. TEST #141 Yellow Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Neither a Yellow alarm nor a Remote Multiframe Alarm nor a F5 state alarm is being received from the remote DS1 endpoint.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Major Alarm Inquiry Test (#142)

The Major alarm raised by a UDS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1000. The Major Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1000. The UDS1 Interface circuit pack takes 10 seconds to recognize and report a Major alarm and 10 seconds to recognize and report that a Major alarm condition is cleared.

When the UDS1 Interface circuit pack detects a Major alarm, it will send a MAJOR-ALARM message to the maintenance software. (32-channel interfaces send a YELLOW alarm to the far end). After the maintenance software receives a MAJOR-ALARM message, the Major Alarm Inquiry Test is initiated to confirm the Major alarm on the UDS1 Interface circuit pack. The Inquiry Test will be run every 10 minutes until the Major alarm is cleared. The maintenance software places all trunks or ports on the circuit pack in the out-of-service state if the Major alarm persists for more than 20 minutes.

When the Major alarm is cleared, the maintenance software restores all trunks or ports on the circuit pack to their previous service state before a Major alarm occurs.

Table 11-385. TEST #142 Major Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-385. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The performance of the DS1 link between the UDS1 interface circuit pack and the remote DS1 endpoint is very poor. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 3. Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. 4. Check the physical connectivity of the UDS1 interface circuit packs and the cable. 5. Replace the local UDS1 interface circuit pack, and repeat the test. 6. If the test still fails, escalate the problem. *Information continues on the next page.*

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Table 11-385. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: 1. The performance of the DS1 link between the UDS1 interface circuit pack and the line-side terminating device is very poor. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 3. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 4. Contact the vendor of the line-side terminating device to diagnose the equipment. 5. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 6. Replace the local UDS1 interface circuit pack and repeat the test. 7. If the test still fails, escalate the problem.
	PASS	No Major alarm is detected in the UDS1 Interface circuit pack.

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Table 11-385. TEST #142 Major Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Minor Alarm Inquiry Test (#143)

The Minor alarm raised by a UDS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1,000,000, but less than 1/1000. The Minor Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. When D4 framing mode is selected, the UDS1 Interface circuit pack takes 41 minutes to recognize and report a Minor alarm and 41 minutes to recognize and report that a Minor alarm condition has cleared. If ESF framing mode is selected, the UDS1 Interface circuit pack takes 10 minutes to recognize and report a Minor alarm and 10 minutes to recognize and report that a Minor alarm condition has cleared.

When the UDS1 Interface circuit pack detects a Minor alarm condition, it will send a MINOR-ALARM message to the maintenance software. After the maintenance software receives a MINOR-ALARM message, the Minor Alarm Inquiry Test is initiated to confirm the Minor alarm. All trunks or ports on the circuit pack are kept in the in-service state after the Minor alarm is confirmed. The Minor Alarm Inquiry Test is run every 10 minutes until the Minor alarm is cleared.

Table 11-386. TEST #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-386. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. The performance of the DS1 link between the UDS1 interface circuit pack and the remote DS1 endpoint is poor. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 3. Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. 4. Check the physical connectivity of the UDS1 interface circuit packs and the cable. 5. Replace the local UDS1 interface circuit pack, and repeat the test. 6. If the test still fails, escalate the problem. *Information continues on the next page.*

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Table 11-386. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: 1. The performance of the DS1 link between the UDS1 interface circuit pack and the line-side terminating device is poor. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 2. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 3. Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the 'Line-Side Terminating Device Operating Manual' for information. 4. Contact the vendor of the line-side terminating device to diagnose the equipment. 5. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 6. Replace the local UDS1 interface circuit pack and repeat the test. 7. If the test still fails, escalate the problem.
	PASS	No Minor alarm is detected in the UDS1 Interface circuit pack.

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Table 11-386. TEST #143 Minor Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Slip Alarm Inquiry Test (#144)

Slips occur when transmitter and receiver are not running at precisely the same clock rate. The UDS1 Interface circuit pack can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry Test is used to acquire the total number of slips that have occurred on a DS1 link.

When the UDS1 Interface circuit pack detects a slip condition, the circuit pack will increase the on-board slip counter by 1. A SLIP-COUNT message is spontaneously sent to the system software after the counter reaches a threshold (for example, 88). When the maintenance software receives the SLIP-COUNT message, the Slip Alarm Inquiry Test is initiated to query the slip counters on a UDS1 Interface circuit pack and total the slip counts in the maintenance software.

If the count of slips is over the threshold, a Minor alarm is raised against the UDS1 Interface circuit pack. All trunks or ports of the UDS1 Interface circuit pack remain in the in-service state. If the UDS1 Interface circuit pack is used to supply the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See TDM-BUS (TDM Bus) and SYNC (Synchronization) Maintenance documentation for details.

Table 11-387. TEST #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-387. TEST #144 Slip Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 to 88	FAIL	The test failed because the UDS1 interface circuit pack and the remote DS1 endpoint are not synchronized to the same clock rate. The UDS1 interface circuit pack detected a slip alarm. The error code equals the number of slips detected by the UDS1 interface circuit pack since the last slip alarm inquiry test. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the DS1 interface circuit pack is a TN464C, enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. 5. Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. 6. Check the physical connectivity of the UDS1 interface circuit packs and the cable. 7. Replace the local UDS1 interface circuit pack, and repeat the test. *Information continues on the next page.*

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Table 11-387. TEST #144 Slip Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 to 88 *(cont'd.)*	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 4. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 5. Contact the vendor of the line-side terminating device to diagnose the equipment. 6. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 7) Replace the local UDS1 interface circuit pack and repeat the test.

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Table 11-387. TEST #144 Slip Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	No Slip alarm is detected on the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Misframe Alarm Inquiry Test (#145)

Misframe Alarm indicates that framing bits observed on a UDS1 Interface circuit pack are in error. The Misframe Alarm Inquiry Test queries the total number of misframes that have occurred on a DS1 Interface circuit pack since the last inquiry.

When the DS1 Interface circuit pack detects a misframe error, it will increase its misframe counter by 1. If the counter reaches a specified threshold (i.e.- 17), a MISFRAME-COUNT message is automatically sent to the switch maintenance software. After the maintenance software receives the MISFRAME-COUNT message, the Misframe Alarm Inquiry Test is initiated to collect the misframe counts from the UDS1 Interface circuit pack.

When the threshold of misframes is reached, if the UDS1 Interface circuit pack is supplying the system synchronization source, then a switching synchronization source message is sent to the TDM Bus Clock. See TDM-BUS (TDM Bus) Maintenance documentation for details. A Minor alarm against the UDS1 Interface circuit pack is raised, but all trunks or ports of the UDS1 Interface circuit pack remain in the in-service state.

Table 11-388. TEST #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-388. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 to 17	FAIL	The test failed because the UDS1 interface circuit pack detected errors in the received framing bits pattern. The error code equals the number of misframes detected by the UDS1 interface circuit pack since the last misframe alarm inquiry test. Major bit and minor bit error rate (error types 2561 and 2817) error logs often accompany misframe alarms. Clearing the cause of these error logs may clear the misframes which are occurring. If the UDS1 connects to a T1 network facility or to another switch, do the following: 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. If the DS1 interface circuit pack is a TN464C, enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. 5. Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. 6. Check the physical connectivity of the UDS1 interface circuit packs and the cable. 7. Replace the local UDS1 interface circuit pack, and repeat the test. *More information continues on the next page.*

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Table 11-388. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1 to 17 *(cont'd.)*	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: 1. Retry the command at 1 minute intervals for a maximum of 5 times. 2. Enter the **list measurement ds1-log PCSS** command to read the error seconds measurement. 3. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 4. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. 5. Contact the vendor of the line-side terminating device to diagnose the equipment. 6. Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 7. Replace the local UDS1 interface circuit pack and repeat the test.
	PASS	No Misframe alarm is detected on the UDS1 Interface circuit pack.

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Table 11-388. TEST #145 Misframe Alarm Inquiry Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Translation Update Test (#146)

The Translation Update Test sends the circuit-pack-level information specified by System Administration to the UDS1 Interface circuit pack. Translation includes the following data administered for a UDS1 Interface circuit pack (see output of **display ds1 PCSS** command): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, Time Slot Number of 697-Hz Tone, Time Slot Number of 700-Hz Tone, etc.

In G3V3, if a TN464F or later UDS1 circuit pack is combined with an AT&T 120A1 CSU Module to form and Integrated CSU Module, this test will also send the administration for this Integrated CSU to the circuit pack to assure the board's translations are correct. The administration of the CSU Module is done using the DS1 circuit pack administration form. Translation for the CSU Module includes the following data: Transmit LBO, Receive ALBO, Supply CPE Loopback Jack Power?, etc.

Table 11-389. TEST #146 Translation Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal system software error. 1. Enter the **display ds1 PCSS** command to verify the UDS1 Interface circuit pack translation. 2. If the test continues to fail, escalate the problem.
	PASS	Translation data has been downloaded to the UDS1 Interface circuit pack successfully.

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Table 11-389. TEST #146 Translation Update Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

DS1 Board Loopback Test (#1209)

This test is destructive.

The DS1 Board Loopback (BLB) Test causes a loopback at the TN464F DS1 board edge and tests DS1 board internal circuitry.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the BLB Test.

When the BLB Test is initiated, maintenance software sends an appropriate message to the TN464F UDS1 Interface circuit pack to start the test. The board will set up the BLB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

When the test is complete, all trunks or ports on the TN464F UDS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-390. TEST #1209 DS1 Board Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	DS1 Board Loopback Test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.

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Table 11-390. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Next, issue the **set synchronization PCSS** command. 3. Lastly, issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.
1950	ABORT	Another loopback/span test is already executing on the DS1 boardor the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.

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Table 11-390. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-390. TEST #1209 DS1 Board Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	UDS1 Interface circuit pack failed the DS1 Board Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the BLB test continues to fail, then replace the UDS1 circuit pack.
	PASS	The BLB test executed successfully. The test pattern was transmitted and received successfully up to the TN464F DS1 board edge.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

CSU Equipment Loopback Test (#1210)

This test is destructive.

The CSU Equipment Loopback (ELB) Test causes a loopback at the near-edge of the local AT&T 120A1 CSU Module and tests the connection from the TN464F DS1 board to the CSU Module (DS1 board edge, connection, and CSU Module edge). This test will only be performed if the AT&T 120A1 CSU Module is present, administered, and connected to a 1.544 Mbps TN464F DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the ELB Test.

When the ELB Test is initiated, maintenance software sends an appropriate message to the TN464F UDS1 Interface circuit pack to start the test. The board will set up the ELB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

In addition, the DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires which may not be detected by the loopback pattern itself.

When the test is complete, all trunks or ports on the TN464F UDS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-391. TEST #1210 CSU Equipment Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-391. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	CSU Equipment Loopback Test cannot be executed in the current configuration. To run this test, the *Near-End CSU Type* field on the DS1 circuit pack administration form must be set to *integrated* and the "Bit Rate" field must be set to "1.544" (24-channel operation). 1. Use the **change ds1 PCSS** command to set the *Near-End CSU Type* field on the DS1 circuit pack administration form to *integrated*, and/or change the "Bit Rate" field to "1.544" if the board is to be used in 24-channel configuration. 2. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 3. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.

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Table 11-391. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. 1. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: ■ Issue the **disable synchronization-switch** command. ■ Next, issue the **set synchronization PCSS** command. ■ Lastly, issue the **enable synchronization-switch** command. Then rerun the test. 2. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.
1950	ABORT	Another loopback/span test is already executing on the DS1 boardor the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span tests can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
1951	ABORT	The CSU Equipment Loopback Test could not be executed because the 120A1 CSU Module was not physically installed. Physically connect the 120A1 CSU Module to the TN464F board on the back of the port carrier.

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Table 11-391. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-391. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	UDS1 Interface circuit pack failed the CSU Equipment Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the ELB test continues to fail, then either the TN464F board, the CSU Module, or the I/O cable between the backplane and the CSU module (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Begin by replacing the CSU Module and running the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 3. If the ELB test continues to fail, then replace the TN464F board and run the *test ds1-loop PCSS ds1/csu-loopback-tests* command again. 4. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module.
	PASS	The ELB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN464F DS1 board to the near-edge of the 120A1 CSU Module.

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Table 11-391. TEST #1210 CSU Equipment Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

CSU Repeater Loopback Test (#1211)

This test is destructive.

The CSU Repeater Loopback (RLB) Test causes a loopback at the far-edge of the local AT&T 120A1 CSU Module and tests the connection from the TN464F DS1 board to and including the CSU Module circuitry. This test will only be performed if the AT&T 120A1 CSU Module is present, administered, and connected to a 1.544 Mbps TN464F DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS ds1/csu-loopback-tests* command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the RLB Test.

When the RLB Test is initiated, maintenance software sends an appropriate message to the TN464F UDS1 Interface circuit pack to start the test. The board will set up the RLB loopback, transmit a test pattern, and verify that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

In addition, the DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires which may not be detected by the loopback pattern itself.

When the test is complete, all trunks or ports on the TN464F UDS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 11-392. TEST #1211 CSU Repeater Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-392. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1005	ABORT	CSU Repeater Loopback Test cannot be executed in the current configuration. To run this test, the *Near-End CSU Type* field on the DS1 circuit pack administration form must be set to *integrated*, and the "Bit Rate" field must be set to "1.544" (24-channel operation). 1. Use the **change ds1 PCSS** command to set the *Near-End CSU Type* field on the DS1 circuit pack administration form to *integrated*, and/or change the "Bit Rate" field to "1.544" if the board is to be used in 24-channel configuration. 2. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 3) If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3) If the test continues to abort, escalate the problem.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-392. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 boardor the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.
1951	ABORT	The CSU Repeater Loopback Test could not be executed because the 120A1 CSU Module was not physically installed. Physically connect the 120A1 CSU Module to the TN464F board on the back of the port carrier.

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Table 11-392. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-392. TEST #1211 CSU Repeater Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	UDS1 Interface circuit pack failed the CSU Repeater Loopback Test. 1. Retry the *test ds1-loop PCSS ds1/csu-loopback-tests* command. 2. If the RLB test continues to fail, and the CSU Equipment Loopback Test (#1210) passed, then replace the CSU Module.
	PASS	The RLB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN464F DS1 board to the far-edge of the 120A1 CSU Module.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

CPE Loopback Jack Test (#1212)

This test is destructive.

The CPE Loopback Jack (CLJ-LB) Test causes a loopback at the CPE Loopback Jack and tests the building wiring connection between the TN464F DS1 board and the CPE Loopback Jack.

The test is highly destructive and can only be initiated by a system technician demanded ***test ds1-loop PCSS cpe-loopback-jack-test-begin [number-of-bits bit-pattern]*** command. The system technician has the choice of entering a loopback activation code on the command line or using the default code (0x47F).

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the CSJ Loopback Test.

The CPE Loopback Test has the TN464F UDS1 Interface circuit pack transmit a loopback activation code to the CPE Loopback Jack, waits up to 10 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result to indicate that the pattern was successfully sent. If the loopback is not established within the 10 seconds, the test returns FAIL.

The status of the CPE Loopback test will be available in the hardware error log via error type 3900. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of Loopback/Span test executing (*Test* field), the type of pattern generated for the Loopback/Span test (*Pattern* field),and whether the pattern(*i.e.* 3-in-24 *Pattern*) is synchronized (*Synchronized* field).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN464F UDS1 Interface circuit pack to the in-service state.

Table 11-393. TEST #1212 CPE Loopback Jack Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS cpe-loopback-jack-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	CPE Loopback Jack Test cannot be executed in the current configuration. To run this test, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-393. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 boardor the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.

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Table 11-393. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-393. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The CLJ-LB test failed because it was not set up properly. The UDS1 interface pack could not successfully put the CPE loopback jack into loopback mode. 1. Rerun the **test ds1-loop PCSS cpe-loopback-jack-test-begin** command. 2. If the test continues to fail, the problem could be with the TN464F board, the CPE loopback jack equipment, or somewhere between. Run the **test ds1-loop PCSS ds1/csu-loopback-tests** command to determine if the loopback tests that are closer to the TN464F board are successful. If any of these tests fail, follow the maintenance strategy that is associated with the test that fails; otherwise, escalate the problem.
3	FAIL	The CPE Loopback Jack Test was not set up properly. The framed 3-in-24 test pattern, generated by the UDS1 Interface circuit pack and looped back through the CPE Loopback Jack, could not be detected properly by the UDS1 circuit pack. 1. Retry the *test ds1-loop PCSS cpe-loopback-jack-test-begin* command. 2. If the CPE Loopback test continues to fail, the problem could be with the TN464F board, the CPE Loopback Jack equipment, or somewhere in between. Run the *test ds1-loop PCSS ds1/csu-loopback-tests* command to see if the loopback tests closer to the TN464F board are successful. If any of those loopback tests fail, follow the maintenance strategy associated with those loopbacks. Otherwise, escalate the problem.
	PASS	The CSJ Loopback test has successfully began executing. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.

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Table 11-393. TEST #1212 CPE Loopback Jack Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Far CSU Loopback Test (#1213)

This test is destructive.

The Far CSU Loopback (R-LLB) Test causes a loopback at the far-end CSU and tests all circuitry and facilities from the local TN464F DS1 board to the far-end CSU.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS far-csu-loopback-test-begin* command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Far CSU Loopback Test.

If the far-end CSU is not an AT&T 120A1 CSU Module, and the UDS1 is administered for ami-zcs line coding, one's density protection must be disabled on the CSU during the test due to the large number of zero's in the 3-in-24 test pattern.

The Far CSU Loopback Test has the TN464F UDS1 Interface circuit pack transmit a loopback activation code to the remote CSU, waits up to 15 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result. If the loopback is not established within the 15 seconds, the test fails.

The status of the Far CSU Loopback test will be available in the hardware error log via error type 3901. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of Loopback/Span test executing (*Test* field), the type of pattern generated for the Loopback/Span test (*Pattern* field),and whether the pattern(*i.e.* 3-in-24 *Pattern*) is synchronized (*Synchronized* field).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN464F UDS1 Interface circuit pack to the in-service state.

Table 11-394. TEST #1213 Far CSU Loopback Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS far-csu-loopback-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Far CSU Loopback Test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-394. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 boardor the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.

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Table 11-394. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.

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Table 11-394. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The test failed because it was not set up properly. The UDS1 pack could not successfully put the far-end CSU into loopback mode. 1. Rerun the **test ds1-loop PCSS far-csu-loopback-test-begin** command. 2. If the test continues to fail, the problem could be with the TN464F board, the CPE loopback jack equipment, or somewhere between. Run the **test ds1-loop PCSS cpe-loopback-jack-test-begin** command to determine if the CPE loopback jack loopback test is successful. If a CPE loopback jack device is not being used, issue the **test ds1-loop PCSS ds1/csu-loopback-tests** command instead. If the closer loopback test fails, follow the maintenance strategy that is associated with that test; otherwise, escalate the problem.
3	FAIL	The Far CSU Loopback Test was not set up properly. The framed 3-in-24 test pattern, generated by the UDS1 Interface circuit pack and looped back through the far-end CSU, could not be detected properly by the UDS1 circuit pack. 1. Retry the ***test ds1-loop PCSS far-csu-loopback-test-begin*** command. 2. If the Far CSU Loopback test continues to fail with this error code, the problem could be with the TN464F board, the far-end CSU equipment, or somewhere in between. Run the ***test ds1-loop PCSS cpe-loopback-jack-test-begin*** command to see if the CPE Loopback Jack test which is closer to the TN464F board is successful. (If a CPE Loopback Jack device is not being used, then run the ***test ds1-loop PCSS ds1/csu-loopback-tests*** command to see if these even closer loopback tests succeed). If the closer loopback test fails, follow the maintenance strategy associated with that loopback. Otherwise, escalate the problem.

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Table 11-394. TEST #1213 Far CSU Loopback Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	The Far CSU Loopback test has successfully began executing. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

One-Way Span Test (#1214)

This test is destructive.

The One-Way Span Test allows one-way span testing to and from remote test equipment or another DEFINITY communications system. This will test all circuitry and facilities from the local TN464F DS1 board to the remote test equipment or other DEFINITY communications system.

The test is destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS one-way-span-test-begin* command.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the One-Way Span Test.

The One-Way Span Test has the TN464F UDS1 Interface circuit pack transmit a framed 3-in-24 test pattern and attempt to receive and verify the pattern. If the TN464F board receives a framed 3-in-24 test pattern sent from another DEFINITY G3V3 or test equipment at the far-end of the DS1, it will begin counting bit errors within the received pattern.

The status of the One-Way Span test will be available in the hardware error log via error type 3902. Several distinct aux values will be used to give the user information of the status of the test.

The *list measurements ds1 summary* command will display the length of time the test has been running (*Test Duration* field) and number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). If the test pattern is being sent cleanly over the span from the far-end, the number of bit errors should be very low. The *Test Duration* field will show *0* until the test pattern is received from the far-end. Upon receiving the test pattern, the board will begin calculating the test duration and number of bit errors. The command will also display the type of Loopback/Span test executing (*Test Field*), the type of pattern generated for the Loopback/Span test (*Pattern Field*),and whether the pattern(*i.e.* 3-in-24 *Pattern*) is synchronized (*Synchronized Field*).

To terminate the test, enter the *test ds1-loop PCSS end-loopback/span-test* command or the **release board** command. Using the **release board** command will restore all trunks or ports on the TN464F UDS1 Interface circuit pack to the in-service state.

Table 11-395. TEST #1214 One-Way Span Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS one-way-span-test-begin* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	One-Way Span Test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit pack via the following command sequence: 1. Issue the **disable synchronization-switch** command. 2. Issue the **set synchronization PCSS** command. 3. Issue the **enable synchronization-switch** command. Then rerun the test. If the test aborts again, a different ABORT error code will be generated. Follow the recommended maintenance procedures for that error code.

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Table 11-395. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The hardware error log will indicate whether a Customer Loopback Jack Test, Far CSU Loopback Test, or the One-Way Span Test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via the *test ds1-loop PCSS end-loopback/span-test* command in order to execute this test.

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Table 11-395. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	The One-Way Span test has successfully began transmitting a framed 3-in-24 test pattern. The test will continue to run until the system technician enters the *test ds1-loop PCSS end-loopback/span-test* command or the *release board PCSS* command.

Continued on next page

Table 11-395. TEST #1214 One-Way Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Inject Single Bit Error Test (#1215)

This test is destructive.

The Inject Single Bit Error Test will cause a single bit error to be sent within an active framed 3-in-24 test pattern.

The test is highly destructive and can only be initiated by a system technician demanded *test ds1-loop PCSS inject-single-bit-error* command. An attempt to use this command will be rejected if none of the three long-duration DS1 loopback/span tests (CPE Loopback Jack Test, Far CSU Loopback Test, One-Way Span Test) are active on a TN464F circuit pack.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Inject Single Bit Error Test.

The *list measurements ds1 summary* command displays the number of bit errors detected (*Loopback/Span Test Bit-Error Count* field). Injecting this single bit error should increment the bit error count of the loopback/span test by one.

Table 11-396. TEST #1215 Inject Single Bit Error Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS inject-single-bit-error* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.

Continued on next page

Table 11-396. TEST #1215 Inject Single Bit Error Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	A single bit error has been successfully injected into an active framed 3-in-24 test pattern.

Continued on next page

Table 11-396. TEST #1215 Inject Single Bit Error Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

End Loopback/Span Test (#1216)

This test is destructive.

The End Loopback/Span Test will terminate an active loopback or span test on a TN464F UDS1 circuit pack. Bit error counting against the received test pattern stream is terminated and sending of the framed 3-in-24 test pattern is halted. If either the CPE Loopback Jack or the far-end CSU is looped, the appropriate loopback deactivate code is sent. If the loopback could not be deactivated, then the test will FAIL and a MINOR alarm will be noted in the alarm log until the loopback is cleared.

The test is highly destructive and can only be initiated by a system technician demanded Since only one of these three different long-duration loopback/span tests can be active at a time, the TN464F circuit pack knows which loopback/span test to terminate.

All trunks or ports on the UDS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running this End Loopback/Span Test.

The *list measurements ds1 summary* command will display the length of time the test ran (*Test Duration* field) and number of bit errors detected (*Loopback/Span Test Bit-Error Count* field).

To restore the trunks or ports on the TN464F UDS1 Interface circuit pack to the in-service state, execute the **release board** command

Table 11-397. TEST #1216 End Loopback/Span Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	End Loopback/Span Test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration form must be set to "1.544" for 24-channel operation.

Continued on next page

Table 11-397. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter the **busyout board PCSS** command to put all trunks or ports of the UDS1 Interface circuit pack into the out-of-service state. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. 1. The UDS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. 2. The tests run on the ports of this circuit pack are returning a no board result. 3. A **busyout** or a **release** command has no affect on the test results. 4. A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of the trunks for this circuit pack are placed into the out of service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. All of the trunks for the UDS1 interface circuit pack are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

Continued on next page

Table 11-397. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1313	FAIL	The TN464F UDS1 circuit pack could not deactivate the loopback through the Customer Loopback Jack. 1. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to fail with this error code, escalate the problem.
1314	FAIL	The TN464F UDS1 circuit pack could not deactivate the loopback through the far-end CSU. 1. Make sure that the far-end DS1 is installed if the far-end CSU is a 120A AT&T CSU Module. 2. Retry the *test ds1-loop PCSS end-loopback/span-test* command at 1-minute intervals for a maximum of 5 times. 3. If the test continues to fail with this error code, escalate the problem.
	PASS	The active long-duration loopback or span test on the TN464F circuit pack was successfully terminated.

Continued on next page

Table 11-397. TEST #1216 End Loopback/Span Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

ICSU Status LEDs Test (#1227)

The TN464F UDS1 circuit pack has four status LEDs on the faceplate in addition to the three standard faceplate LEDs. These four status LEDs are associated with the 120A1 Channel Service Unit (CSU) Module that can be connected to the TN464F board via the I/O connector panel on the back of the port carrier. The TN464F circuit pack combined with AT&T's new 120A1 CSU Module forms an Integrated CSU (ICSU).

This test is a visual test. It will light the four status LEDs red for 5 seconds, then light them green for 5 seconds, then light them yellow for 5 seconds, then turn the LEDs off and returns control of the status LEDs to the circuit pack.

This test will only be executed on a TN464F or later suffix UDS1 circuit packs administered for 24-channel operation (1.544 bit rate).

If the 120A1 CSU Module is not physically installed, the status LEDs are always off and this test will abort.

Table 11-398. TEST #1227 ICSU Status LEDs Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	The ICSU Status LEDs test can not be executed for the current configuration. The test applies only to TN464F or later UDS1 circuit packs administered for 24-channel operation (1.544 bit rate). 1. If the circuit pack is a TN464F or later suffix UDS1 circuit pack, then retry the command. 2. If the test continues to abort, escalate the problem.
1951	ABORT	The ICSU Status LEDs Test can not be executed because a 120A1 or later suffix CSU Module is not physically installed. If using a 120A1 CSU Module, physically connect it to the TN464F board on the back of the port carrier. Otherwise, ignore this abort.

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Table 11-398. TEST #1227 ICSU Status LEDs Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times. 2. If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error 1. Retry the command. 2. If the test continues to abort, follow normal escalation procedures.
	PASS	The ICSU Status LEDs test executed successfully. A PASS result, however, does not necessarily mean that the status LEDs behaved properly. It only means that the software successfully attempted to light the status LEDs. This is a visual test. The service technician must visually exam the behavior of the LEDs while the test is running. The LEDs are functioning properly if the four status LEDs are lit red for 5 seconds, then lit green for 5 seconds, then lit yellow for 5 seconds. If the LEDs behave differently, the board should be replaced at the customer's convenience.

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Table 11-398. TEST #1227 ICSU Status LEDs Test — *Continued*

Error Code	Test Result	Description/ Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. 1. Ensure that the board translations are correct. Execute the **add ds1 PCSS** command to administer the UDS1 interface if it is not already administered. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. 3. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. 4. Issue the **reset board** command. 5. Issue the **release busy board** command. 6. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

WAE-PORT (Wideband Access Endpoint Port)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run	Full Name of MO
WAE-PORT[1]	MINOR	test access-endpoint <extension> l	Wideband Access Endpoint Port
WAE-PORT	WARNING	test access-endpoint <extension>	Wideband Access Endpoint Port

1 For additional repair information, see also UDS1-BD (UDS1 Interface Circuit Pack) Maintenance documentation.

The Wideband Switching capability supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. DEFINITY switching capabilities are extended to support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

The Wideband Switching capability extends the DEFINITY G3 Administered Connections feature to include non-signaling Wideband Access Endpoints. Endpoint application equipment with direct T1 or E1 interfaces may connect directly to the switch’s line-side facilities. Application equipment without T1 or E1 interfaces requires a Terminal Adapter, such as a DSU/CSU. The terminal adapter or endpoint application equipment is connected to the Universal DS1 circuit pack (TN464C). These endpoints are administered as Access Endpoints, and they have no signaling interface to the switch. Instead, they simply transmit and receive data. (Some applications detect and respond to the presence or absence of data.) Calls are initiated from these endpoints using the Administered Connections feature.

Multiple Access Endpoints on one line-side UDS1 circuit pack (TN464C) facility are separate and distinct within the facility, and the endpoint application equipment must be administered to send and receive the correct data rate over the correct DS0s. All Administered Connections originating from Access Endpoints use the entire bandwidth administered for the Access Endpoint. An incoming call of a different data rate then that administered for the Access Endpoint cannot be routed to the Access Endpoint.

Although Wideband Access Endpoints are used primarily for line-side facilities, these endpoints can also be administered on network DS1 facilities to connect DEFINITY to non-switched network services, such as the AT&T fractional T-1 service. An example of this is the AT&T Static Integrated Network Access, where a trunk group to AT&T 4Ess Switched Services shares an access T-1 facility with a Wideband Access Endpoint. In this case, the Wideband Access Endpoint is connected to the AT&T fractional T-1 service, and it does not terminate on local endpoint equipment but is connected to a far-end CPE (for example, another DEFINITY PBX) via the dedicated fractional T-1. All Wideband Access Endpoint functionality and operation is identical on both line-side and network facilities. However, because maintenance capabilities are limited to the Wideband Access Endpoint interface, and because faults can occur end-to-end, troubleshooting procedures based on an end-to-end view of the network is required.

Wideband Access Endpoint Port maintenance provides a strategy for maintaining a Wideband Access Endpoint Port via a port on the Universal DS1 interface circuit pack hardware. The maintenance strategy involves logging Wideband Access Endpoint Port hardware errors, running tests for port initialization, periodic and scheduled maintenance, system technician-demanded tests, and alarm escalation and resolution. Two different port service states are specified in the Wideband Access Endpoint Port maintenance. These states include *out-of-service*, where the port is in a deactivated state and cannot be used for calls, and *in-service*, where the port is in an activated state and can be used for calls. If the Universal DS1 Interface circuit pack (TN464C) is out-of-service, all ports on the Universal DS1 Interface circuit pack (TN464C) are placed into the out-of-service state.

Hardware Error Log Entries and Test to Clear Values

Wideband Access Endpoint Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test access-endpoint <extension> sh r 1
18 (a)	0	busyout access-endpoint	WARNING	OFF	release access-endpoint <extension>
130 (b)		None	WARNING	ON	test access-endpoint <extension>
1281 (c)		Conference Circuit (Test #7)	MINOR	ON	test access-endpoint <extension> l r 4
1537 (d)		NPE Crosstalk Test (#6)	MINOR	ON	test access-endpoint <extension> l r 3
1793 (e)		None			test board PCSS long
3840 (f)	Any	Port Audit and Update (Test #36)			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a. The wideband access endpoint has been busied out by a **busyout access-endpoint <extension>** command. No calls can be made to this extension.

b. The circuit pack has been removed, or it has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. The Conference Circuit Test (#7) failed on this port. See Test #7 for repair procedures.

d. The NPE Crosstalk Test (#6) failed on this port. See Test #6 for repair procedures.

e. There was a failure of the TN464C UDS1 Interface circuit pack. See UDS1-BD Maintenance documentation for details.

f. The Port Audit and Update Test (#36) failed due to an internal system error. Enter the **status access-endpoint <extension>** command and verify the status of the port. If the wideband access endpoint is out-of-service, enter the **release access-endpoint <extension>** command to put it back to in-service. Retry the test command. If the test continues to fail, escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit and Update Test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. (The TN464C UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips). The NPE controls port connectivity and gain, and it provides conferencing functions on a per-port basis. The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and that it never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's Long Test Sequence, and it takes between 20 and 30 seconds to complete.

Table 11-399. TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status access-endpoint <extension>** command to determine when the port is available for testing. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.
1001	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.

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Table 11-399. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots that are out-of-service due to TDM-BUS errors. The **status health** command can be used to determine if the system is experiencing heavy traffic. Refer to TDM-BUS Maintenance documentation to diagnose any active TDM-BUS errors. 1. If system has no TDM-BUS errors, and if it is not handling heavy traffic, repeat the test at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. The **list measurement tone-receiver** command displays information on the system's tone receivers. 1. Look for TTR-LEV errors in the Error Log. If errors are present, refer to TTR-LEV Maintenance documentation. 2. Look for TONE-PT errors in the Error Log. If errors are present, refer to TONE-PT Maintenance documentation. 3. If neither condition exists, retry the test at one minute intervals a maximum of five times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status access-endpoint <extension>** command to determine when the port is available for testing. The port is available when it is in the **in-service/idle** state. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.

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Table 11-399. TEST #6 NPE Crosstalk Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1020	ABORT	The test did not run due either to a previously existing error on the specific port or to a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or the circuit pack, and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. User-reported troubles on this port should be investigated by using other port tests and by examining the terminal adapter or the external wiring.

Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. (The TN464C UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips). The NPE controls port connectivity and gain, and it provides conferencing functions on a per-port basis. The Conference Circuit Test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and to conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 11-400. TEST #7 Conference Circuit Test

Error Code	Test Result	Description/ Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status access-endpoint <extension>** command to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use the **status access-endpoint <extension>** command to determine when the port is available for testing. The port is available when it is in the **in-service/idle** state. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, and if the port is not in use, escalate the problem.
1020	ABORT	The test did not run due either to a previously existing error on the specific port or to a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or circuit pack, and attempt to diagnose the previously existing error.

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Table 11-400. TEST #7 Conference Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. Although wideband calls do not use the conferencing feature on the NPE, this failure indicates problems with the circuit pack hardware. 1. Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. 1. User-reported troubles on this port should be investigated by using other port tests and by examining the terminal adapter or the external wiring.

Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the UDS1 Interface circuit pack to ensure that the wideband access endpoint port's translation is correct.

Table 11-401. TEST #36 Audit and Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1006	ABORT	The port is out-of-service. If the port is busied out: 1. Issue **release access-endpoint <extension>** command to put the port back into in-service. 2. Retry the test command. If the port is not busied out: 1. Check the error and alarm logs for WAE-PORT and UDS1-BD errors and alarms. Follow the recommended repair procedures.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	Internal system error. 1. Retry the command at one minute intervals a maximum of five times. 2. If the test continues to fail, escalate the problem.
	PASS	Port translation has been updated successfully.

XXX-BD (Common Port Circuit Pack)

MO Name As It Appears in Alarm Log	Alarm Level	Initial System Technician Command to Run (a)	Full Name of MO
XXX-BD[1]	MAJOR	test board PCSS	Common Port Circuit Pack Maintenance
XXX-BD[1]	MINOR	test board PCSS	Common Port Circuit Pack Maintenance
XXX-BD[1]	WARNING	test board PCSS	Common Port Circuit Pack Maintenance

1 Refer to the appropriate circuit pack documentation to get the correct MO name displayed in this field. It usually ends with BD.

a. Where P is the port network number (1 for PPN and 2 or 3 for EPN); C is the carrier designation (for example, A, B, C, D, or E); and SS is the address of the slot in the carrier where the circuit pack is located (for example, 01, 02,...etc.)

The Common Port Circuit Pack Maintenance is a set of common tests used by all the circuit packs with the generic hardware that interfaces with the TDM bus. Circuit packs included in this category are listed on the following pages.

Notes:

a. All circuit pack suffixes (B,C, D, etc.) are also supported by the XXX-BD (Common Port Circuit Pack) Maintenance documentation.

b. The XXX-BD designation is also used in the SAT display in the case where a **reset board command** is issued to a circuit pack type which is in conflict to the actual circuit pack type administered for that slot or when a **reset board** command is issued to an empty circuit pack slot.

When any of the Common Port Circuit Packs (except the TN754 Digital Line and TN758 Pooled Modem circuit packs) are physically removed from the backplane, no alarm is logged for approximately 11 minutes. In the case of the Digital Line and Pooled Modem circuit packs, approximately 21 minutes elapse before an alarm is logged. When a circuit pack that has been removed is alarmed, the alarm type is minor and is classified as an on-board alarm. The time delay permits maintenance activity to be performed without triggering an additional alarm. **An alarm is logged only against a Common Port Circuit Pack on which ports have been administered.** See the next Note.

NOTE:
In a heavily loaded system, the interval between the removal of a Common Port Circuit Pack and the logging of the alarm may be several minutes longer.

XXX-BD Common Circuit Packs

The following list of circuit packs are listed by apparatus code, including circuit packs used in non-United States installations. .

Table 402. XXX-BD Common Circuit Packs

Apparatus Code	Name	Type
(TN566) (TN567)	DEFINITY AUDIX R3 System	Port Assembly
(TN2208)	Call Visor ASAI over the DEFINITY (LAN) Gateway R1	Port Assembly
TN417	Auxiliary Trunk	Port
TN419B	Tone-Clock	Control
TN420B/C	Tone Detector	Service
TN429	Direct Inward/Outward Dialing (DIOD) Trunk	Port
TN433	Speech Synthesizer	Service
TN436B	Direct Inward Dialing Trunk	Port
TN437	Tie Trunk	Port
TN438B	Central Office Trunk	Port
TN439	Tie Trunk	Port
TN447	Central Office Trunk	Port
TN457	Speech Synthesizer	Service
TN458	Tie Trunk	Port
TN459B	Direct Inward Dialing Trunk	Port
TN464C/ D/E/ F	DS1/E1 Interface - T1, 24 Channel - E1, 32 Channel	Port
TN465/B/C	Central Office Trunk	Port
TN467	Analog Line	Port
TN468B	Analog Line	Port
TN479	Analog Line	Port
TN497	Tie Trunk	Port

Continued on next page

Table 402. XXX-BD Common Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN553	Packet Data Line	Port
TN556/B	ISDN-BRI 4-Wire S/T-NT Line (A-Law)	Port
TN570/B/C	Expansion Interface	Port
TN572	Switch Node Clock	Control
TN573/B	Switch Node Interface	Control
TN574	DS1C - T1, 24 Channel	Port
TN577	Packet Gateway - G3r Only	Port
TN722B	Digital Signal Level 1 Tie Trunk	Port
TN725B	Speech Synthesizer	Service
TN726/B	Data Line	Port
TN735	MET Line	Port
TN742	Analog Line	Port
TN744	Call Classifier	Service
TN744/B/C	Call Classifier - Detector	Service
TN744D	Call Classifier - Detector - Multi-Country	Service
TN746/B	Analog Line	Port
TN747B	Central Office Trunk	Port
TN748/B/C/D	Tone Detector	Service
TN750/B	Announcement	Service
TN750C	Announcement	Service
TN753	Direct Inward Dialing Trunk	Port
TN754/B	Digital Line 4-Wire DCP	Port
TN755B	Neon Power Unit	Power
TN756	Tone Detector	Service
TN758	Pooled Modem	Port
TN760B/C/D	Tie Trunk	Port
TN762B	Hybrid Line	Port
TN763B/C/D	Auxiliary Trunk	Port
TN765	Processor Interface	Control
TN767B/C/D/E	DS1 Interface - T1, 24 Channel	Port

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Table 402. XXX-BD Common Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN768	Tone-Clock	Control
TN769	Analog Line	Port
TN771D	Maintenance/Test	Service
TN772	Duplication Interface	Control
TN775/B	Maintenance	Service
TN776	Expansion Interface	Port
TN777/B	Network Control	Control
TN778	Packet Control	Control
TN780	Tone-Clock	Control
TN786	Processor	Control
TN786B	Processor	Control
TN789	Radio Controller	Control
TN790	Processor	Control
TN791	Guest Line (16-Port Analog Line)	Port
TNCCSC-1	CCSC-1 PRI to DASS Converter	Port
TNCCSC-2	CCSC-2 ISDN PRI to DPNSS Converter	Port
TNPRI/BRI	PRI to BRI Converter	Port
TN2135	Analog Line	Port
TN2136	Digital Line 2-Wire DCP	Port
TN2138	Central Office Trunk	Port
TN2139	Direct Inward Dialing Trunk	Port
TN2140/B	Tie Trunk	Port
TN2144	Analog Line	Port
TN2146	Direct Inward Dialing Trunk	Port
TN2147/C	Central Office Trunk	Port
TN2149	Analog Line	Port
TN2180	Analog Line	Port
TN2181	Digital Line 2-wire DCP	Port
TN2182/B	Tone-Clock - Tone Detector and Call Classifier	Control
TN2183	Analog Line	Port

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Table 402. XXX-BD Common Circuit Packs — *Continued*

Apparatus Code	Name	Type
TN2184	DIOD Trunk	Port
TN2198	ISDN-BRI 2-Wire U Interface	Port
TN2199	Central Office Trunk	Port
TN2224	Digital Line, 24-Port, 2-Wire DCP	Control

Hardware Error Log Entries and Test to Clear Values

Common Port Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS sh r 1
1(a)	0	Circuit pack removed or SAKI Sanity Test (#53)	MINOR	ON	
18(b)	0	busyout board PCSS	WARNING	OFF	release board PCSS
23(c)	0	None	WARNING	OFF	
36 (d)	4368	none			
125 (e)		None	MINOR	ON	
217[2] (f)	0	None	WARNING	ON	
257	65535	Control Channel Test (#52)	MINOR	ON	test board PCSS sh r 20
257 (g)	Any	None			
267 (f)	0	None	WARNING	ON	
513 (h)	Any	None	MINOR	ON	test board PCSS sh
769 (i)	4358	None			
1025 (j)	4363	NPE Audit Test (#50)			test board PCSS l r 20
1281 (k)		Ringing Application Test (#51)	MINOR	ON	test board PCSS r 2
1538 (l)	Any	None	WARNING/ MINOR	ON	
1793 (m)		Neon Test (#220)	MINOR	ON	test board PCSS r 2
3840 (n)	Any	None			
3999 (o)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 G3iV1-1.286 or G3iV2-386 only

Notes:

a. This error indicates the circuit pack totally stopped functioning or it was physically removed from the system. This error type is not applicable to ANN-BD, DETR-BD, S-SYN-BD, M/T-BD, or CLSFY-BD.

> **NOTE:**
> The alarm is logged approximately 11 minutes after the circuit pack has been removed and/or SAKI Sanity Test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, follow the instructions for "Red (alarm)" in the "Control and Port Circuit Pack Status LEDs" section in Chapter 7, "LED Interpretation" (See also the "Handling Port Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures")

b. This error indicates the circuit pack has been busied out. Release the circuit pack via **release board PCSS**.

c. The circuit pack has been logically administered but not physically installed. The alarm should clear when the circuit pact is installed.

If the circuit pack is already installed:

1. Run **test board PCSS long** and look at any test failures or error codes generated.
2. If the test does not clear error 23, then execute **reset board PCSS** and run the long test again.
3. If the reset/test does not clear error 23, replace the circuit pack.

d. This error applies only to the Maintenance/Test circuit pack (TN771B or TN771C). The error indicates that the hardware associated with the Analog Trunk Testing port of the circuit pack failed to initialize. This port is **not** used in G3iV1.1-286 or G3iV2-386. Note, however, that when this error occurs, the Maintenance/Test circuit pack may report an invalid vintage. Although this error is not service-affecting, the Maintenance/Test circuit pack should be replaced.

e. A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

f. This error applies to the Maintenance/Test circuit pack (TN771D), Tone Detector (TN748B, TN748C, or TN748D), and Call Classifier (TN748) circuit packs. For the Maintenance/Test circuit pack, the error indicates that there is more than one Maintenance/Test circuit pack in the port network. For the Tone Detector or Call Classifier packs, the error indicates that there are more than 10 circuit packs in the system. Remove the circuit pack against which the error is logged.

g. This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

h. This error, when reported with Aux data in the range of 4352 to 4358, indicates that the circuit pack has reported an on-board hardware failure. The circuit pack continuously tests the hardware and report the results approximately every 10 minutes. If the hardware problem is resolved, the "leaky bucket" strategy should clear the alarm in approximately 30 minutes. However, if the alarm does NOT clear in 30 minutes, the circuit pack should be replaced.

i. This error can be ignored, but look for other errors on this circuit pack.

j. This error is not service-affecting and no action is required.

k. This error indicates that no ringing current is detected. Run Test #51, Ringing Application Test, and follow the procedures for Test #51. This error is only applicable to Analog Line circuit packs.

l. The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The common circuit pack level tests such as Test #51 and/or Test #220 are aborting with error code 2000.
   2. The tests run on the ports of this circuit pack are returning with a NO-BOARD.
   3. A busyout/release of the circuit pack has no affect on test results.
   4. A **list configuration** command shows that the circuit pack and ports are properly installed.

   If the XXX-BD is not a TN754 Digital Line Circuit Pack (DIG-BD), and if this error happens again within 15 minutes, replace the circuit pack. If the XXX-BD is a TN754 Digital Line Circuit Pack (DIG-BD), check the alarm level. If the alarm level is a WARNING, this indicates that users are probably causing the hyperactivity by playing with their digital stations. If the circuit pack is really hyperactive, this alarm is upgraded to a MINOR alarm within one hour. If the alarm level is a MINOR alarm, replace the circuit pack. (Refer to the "Handling Port Circuit Packs" section in Chapter 5, "Routine Maintenance Procedures".)

m. This error indicates that no neon current is detected. Run Test #220, Neon Test, and follow the procedures for Test #220. This error is applicable only to TN769 and TN746 Analog Line circuit packs.

n. This error is not service-affecting and no action is required.

o. Error type 3999 indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Control Channel Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
NPE Audit Test (#50)		X		ND
Ringing Application Test (#51) (a)	X	X		ND
Control Channel Loop Around Test (#52)	X	X		ND
SAKI Sanity Test (#53)		X	D	
Neon Test (#220) (b)	X	X		ND

1 D = Destructive; ND = Nondestructive

a. Only applicable to Analog Line circuit packs.

b. Only applicable to TN746 and TN769 Analog Line circuit packs.

NPE Audit Test (#50)

The system sends a message to the on-board microprocessor to update the network connectivity translation for all the Network Processing Elements (NPEs) on the circuit pack.

Table 11-403. TEST #50 NPE Audit Test

Error Code	Test Result	Description/ Recommendation
none or 2100	ABORT	System resources required for this test are not available.
1019	ABORT	Test already in progress.
	FAIL	Internal System Error. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	PASS	The circuit pack's NPEs have been updated with their translation.

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Table 11-403. TEST #50 NPE Audit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	EXTRA BD	Certain circuit packs have limitations on how many circuit packs can be in the system or port network such as the Maintenance/Test circuit pack (TN771B or TN771C), the Tone Detector circuit pack (TN748B, TN748C or TN748D) and the Call Classifier (TN744). The Maintenance/Test circuit pack allows only one circuit pack per port network. The Tone Detector and Call Classifier allow only 10 circuit packs in each system. All additional circuit packs return EXTRA-BD and should be removed.
any	NO BOARD	This is normal if the test is being done when (a) the circuit pack is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. 1. Verify that the circuit pack is physically in the system. 2. Verify that the system is not in a stage of booting up. 3. Retry the command at one-minute intervals for a maximum of five times. 4. If the test continues to return NO BOARD, escalate the problem.

Ringing Application Test (#51)

This test checks the ringing application circuitry common to all ports on an Analog Line circuit pack.

Table 11-404. TEST #51 Ringing Application Circuit Test

Error Code	Test Result	Description/ Recommendation
1000 or 2100	ABORT	Could not allocate the necessary system resources to run test.
	ABORT	Could not allocate the necessary system resources to run test. The circuit pack is not installed. Internal System Error.
2000	ABORT	There was no response from the board. 1. If error type 1538 (hyperactivity) is present in the error log, follow the maintenance strategy that is recommended for this error type. 2. Run the **busyout board**, **reset board**, and **release busy board** commands,and then retest. 3. If the test still aborts, dispatch with the circuit pack. 4. Check the off-board wiring and the terminal, and, if there are no problems found, replace the circuit pack.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort and the port is idle, escalate the problem.

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Table 11-404. TEST #51 Ringing Application Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1008	ABORT	Could not allocate a ringing circuit for one of the following reasons: all the ringing circuits are in use; the ringing generator is defective; ringing generator is not wired correctly. 1. If the test continues to abort, look for RING-GEN error in Error Log. a. If there are RING-GEN errors, refer to RING-GEN Maintenance documentation and try to resolve any problem(s). Go to Step 2. b. If there are no RING-GEN errors, and the test continues to abort, issue the **test board PCSS** command on other TN742, TN769, or TN746 Analog circuit packs. If an ABORT with error code 1008 occurs for this test on other circuit packs as well, the ringing generator may be defective or may not be wired properly. Refer to RING-GEN Maintenance documentation for details. If an ABORT with error code 1008 does NOT occur on the other ports, then all four ring generators are in use. Exit from this documentation. 2. Retry the command. 3. If the test continues to abort, escalate the problem.
	FAIL	No ringing current is detected. The ringing application circuitry on this circuit pack probably is not healthy. 1. Retry the command again. 2. If the test continues to fail, look for RING-GEN error in Error Log. a. If there are RING-GEN errors, refer to the RING-GEN Maintenance documentation and try to resolve any problem(s). b. If there are no RING-GEN errors, replace the circuit pack. 3. Retry the command again. 4. If the test continues to fail, escalate the problem.

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Table 11-404. TEST #51 Ringing Application Circuit Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	PASS	Ringing current is detected or this vintage of the Analog Line circuit pack does not support the Ringing Application Circuit Test. Analog Line circuit packs that DO NOT support Test #51 include TN712 Vintage 13 and earlier and TN742 Vintage 3 and earlier.
any	NO BOARD	This is normal if the test is being done when (a) the circuit pack is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. 1. Verify that the circuit pack is physically in the system. Verify that the system is not in a stage of booting up. Retry the command at one-minute intervals for a maximum of five times. If the test continues to return NO BOARD, escalate the problem.

Control Channel Loop Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 11-405. TEST #52 Control Channel Loop Around Test

Error Code	Test Result	Description/ Recommendation
none or 2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
	FAIL	The test failed because the circuit pack failed to return the circuit pack code or vintage. 1. Retry the command for a maximum of 5 times. 2. If the test still fails, issue the **busyout board**, **reset board**, and **release busy board** commands, and then retest. 3. If the problem continues, replace the circuit pack. 4. Run the test again. 5. If the test continues to fail, escalate the problem.
	PASS	Communication with this circuit pack is successful.

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Table 11-405. TEST #52 Control Channel Loop Around Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	EXTRA BD	This result should only appear for the TN771B or TN771C Maintenance/Test circuit pack. More than one circuit pack has been installed in this port network. Remove this circuit pack.
any	NO BOARD	This is normal if the test is being done when (a) the circuit pack is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. 1. Verify that the circuit pack is physically in the system. 2. Verify that the system is not in a stage of booting up. 3.) Retry the command at one-minute intervals for a maximum of five times. 4. If the test continues to return NO BOARD, escalate the problem.

SAKI Sanity Test (#53)

This test is destructive.

This test resets the circuit pack.

This test is executed as part of the long test sequence only for the Tone-Clock circuit pack and DS1 interface circuit packs. All other common circuit packs can be reset via the **reset board PCSS** command. The **reset** command executes this test.

Table 11-406. TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
none	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	Wrong circuit pack configuration to run this test. This error applies only to DS1 interface circuit packs. It means the DS1 interface circuit pack is providing timing for the system and, therefore, it cannot be reset without major system disruptions. 1. If the circuit pack needs to be reset, set synchronization to another DS1 interface circuit pack or the Tone-Clock circuit pack and try again. Refer to SYNC (Synchronization) Maintenance documentation.
1015	ABORT	Port is not out-of-service. 1. Busy out the circuit pack. 2. Execute command again.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The circuit pack failed to reset.

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Table 11-406. TEST #53 SAKI Sanity Test — *Continued*

Error Code	Test Result	Description/ Recommendation
2	FAIL	The circuit pack failed to restart. 1. Execute command again. 2. If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. 1. Run the Short Test Sequence.
any	NO BOARD	This is normal if the test is being done when (a) the circuit pack is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. 1. Verify that the circuit pack is physically in the system. 2. Verify that the system is not in a stage of booting up. 3. Retry the command at one-minute intervals for a maximum of five times. 4. If the test continues to return NO BOARD, escalate the problem.

Neon Test (#220)

This test checks the voltage required to light the neon lamp on an analog terminal. A relay connects a 150V DC source from the backplane of the circuit pack onto the voltage bus, and another relay connects a 2K shunt from the bus to ground. Current in the line is then monitored to determine if the voltage is present.

The neon test runs only for TN746 and TN769 Analog circuit packs. If the circuit pack is not a TN746 or TN769, the test returns PASS, but there is no testing done to the circuit pack.

Table 11-407. TEST #220 Neon Test

Error Code	Test Result	Description/ Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 10, "Maintenance Commands and Trouble-Clearing Aids" for a full description of all possible states.) You must wait until the port is idle before retesting. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, escalate the problem.
1008	ABORT	Could not allocate a ringing circuit. Either all the ringing circuits are in use, or the ringing generator is defective or is not wired correctly. 1. Retry the command at one-minute intervals a maximum of five times. 2. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is not wired correctly (see errors for RING-GEN). If it doesn’t occur on port test 48 for ANL-16-L, then all four ring phases are in use. 3. If the test to continues to abort, escalate the problem.

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Table 11-407. TEST #220 Neon Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT	There are not any translated ports on the circuit pack, or if there are ports, then none are administered to have "neon." 1. Verify that there are ports administered on the circuit pack. If no ports are administered, no further action is required. 2. Make sure a TN755 or TN752 power unit circuit pack is installed. 3. Verify that you have neon sets connected (AT&T sets that may be neon sets are 500 and 2500 series, also some non-AT&T may also be neon sets). If no neon sets are connected to the circuit pack, the test continues to abort, but no further action is required. 4. If there are no neon sets connected to the circuit pack, at least one port needs to be translated with neon. To check if a port is translated with neon, use the **display port PCSSpp** command to determine the station extension of any station on this circuit pack. Use the **display station <extension>** to determine if the port is administered with neon. The field "Message Waiting Indicator:" must be set to "neon" for at least one of the administered ports. If this field is not administered to "neon" the test continues to abort. This is acceptable because not all stations have neon lamps on their analog terminals. If none of the terminals have neon lamps, the the test continues to abort, but no further action is required.

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Table 11-407. TEST #220 Neon Test — *Continued*

Error Code	Test Result	Description/ Recommendation
1018	ABORT *(cont'd.)*	5. Retry the command again. 6. If the test continues to abort with neon translated ports, escalate the problem. 7. Retry the command at one-minute intervals a maximum of five times. 8. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is not wired correctly (see errors for RING-GEN). If it doesn't occur on port test 48 for ANL-16-L, all four ring phases are in use. 9. If the test to continues to abort, escalate the problem. 10. Retry the command again. 11. If the test continues to abort with neon translated ports, escalate the problem.
2000	ABORT	Response to the request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Could not allocate the necessary system resources to run this test. Internal System Error. 1. If Error Type 1538 is present in the Error Log, follow the recommended maintenance strategy.

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Table 11-407. TEST #220 Neon Test — *Continued*

Error Code	Test Result	Description/ Recommendation
	FAIL	The test failed because no neon current was detected. 1. Determine if there is a TN755 or TN752 power unit circuit pack installed in the same carrier as the TN746 or TN769 analog line circuit pack that failed the test. Look for the failure of test 220 on other TN746 or TN769 circuit packs in the carrier. If test 220 fails on the other circuit packs, replace the TN755 or TN752 power unit circuit pack. 2. Retry the command again. 3. If the test continues to fail, replace the circuit pack. 4. Retry the command again. 5. If the test continues to fail, escalate the problem.
	PASS	This circuit pack is a TN746 or TN769 Analog Line circuit pack and the neon current is detected. This test also returns PASS for circuit packs that are not TN746 or TN769 circuit packs, but the test is not run on the circuit pack and the results of this test can be ignored.
any	NO BOARD	This is normal if the test is being done when (a) the circuit pack is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. 1. Verify that the circuit pack is physically in the system. 2. Verify that the system is not in a stage of booting up. 3. Retry the command at one-minute intervals for a maximum of five times. 4. If the test continues to return NO BOARD, escalate the problem.

References

A

The following is a list of DEFINITY Enterprise Communications Server (ECS) Release 5 documents, including a brief description of each document.

To order these or other DEFINITY documents, contact the Lucent Technologies Publications Center at the address and phone number on the back of this document's title page. A complete list of Business Communications Systems (BCS) documents, including previous issues of the documents listed here, is provided in *BCS Publications Catalog,* 555-000-010.

Basic DEFINITY ECS Documents

The following are basic documents for anyone using DEFINITY ECS.

***DEFINITY Enterprise Communications Server Release 5 — Pocket Reference, Issue 1,* 555-230-207**

A compact reference containing hardware descriptions, system parameters, and listings of features and system configurations.

***DEFINITY Enterprise Communications Server Release 5 — Feature Description, Issue 1*, 555-230-301**

Provides comprehensive technical descriptions of system features and parameters. Includes the applications and benefits, feature interactions, administration requirements, hardware and software requirements, and a brief discussion of data communications and private networking configurations.

***DEFINITY Enterprise Communications Server Release 5 — Implementation, Issue 1*, 555-230-302**

Provides step-by-step procedures for preparing the hardcopy forms that correspond to the screens and are required to implement the features, functions, and services of the system. Includes procedures for completing a communications survey. Includes an initial set of blank forms (555-230-655B, 555-230-653B).

***DEFINITY Enterprise Communications Server Release 5 — Implementation Blank Forms, Issue 1*, 555-230-303**

Provides additional blank hardcopy forms that correspond to the screens that are required to implement the features, functions, and services of the system.

Copies of these forms are automatically included with the *DEFINITY Enterprise Communications Server Release 5 Implementation, Issue 1*, 555-230-302. Use this order number to purchase additional forms.

***DEFINITY Enterprise Communications Server Release 5 — System Description and Specifications, Issue 1*, 555-230-203**

Provides a technical description of the systems and is intended for service personnel, sales personnel, and customers. Includes descriptions of hardware, technical specifications, environmental requirements, and maintenance requirements.

***DEFINITY Enterprise Communications Server Release 5 — System Monitoring and Reporting, Issue 3*, 555-230-511**

Provides detailed descriptions of all the measurement, status, and security reports available in the system and is intended for administrators who validate traffic reports and evaluate system performance. This document was titled *Traffic Reports* for earlier systems. It includes corrective actions for potential problems.

***DEFINITY Communications System Generic 1 and Generic 3 — Installation and Test, Issue 5*, 555-230-104**

Provides descriptions of the procedures for installing and testing the system's common equipment and adjuncts. Includes setup procedures for the system management terminal, power and grounding requirements, and testing steps. Includes compete details on system wiring. Provides both domestic and international information.

***DEFINITY Enterprise Communications Server Release 5 — Installation and Test for Single-Carrier Cabinets, Issue 2*, 555-230-894**

Provides procedures and information for hardware installation and initial testing of single-carrier cabinets. This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Castillian Spanish (SP), and Japanese (JA).

To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

***DEFINITY Enterprise Communications Server Release 5 — Installation and Test for Multi-Carrier Cabinets, Issue 1,* 555-230-112**

Provides procedures and information for hardware installation and initial testing of multi-carrier cabinets.

***DEFINITY Communications System Generic 3 Version 1.1 - Version 4 Upgrades and Additions, Issue 2*, 555-230-107**

Provides procedures for an installation technician to convert an existing DEFINITY Communications System earlier than Generic 3 Version 4 to Generic 3 Version 4.

***DEFINITY Enterprise Communications Server Release 5 — Upgrades and Additions for R5r, Issue 1,* 555-230-121**

***DEFINITY Enterprise Communications Server Release 5 — Upgrades and Additions for R5vs/si, Issue 1*, 555-230-120**

Provides procedures for an installation technician to convert an existing DEFINITY Communications System Generic 3 Version 4 to DEFINITY ECS.

Included are upgrade considerations, lists of required hardware, and step-by-step upgrade procedures. Also included are procedures to add control carriers, switch node carriers, port carriers, circuit packs, auxiliary cabinets, and other equipment.

***DEFINITY Enterprise Communications Server* Release 5 — *Maintenance for R5r, Issue 5*, 555-230-105**

***DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5vs/si, Issue 9*, 555-204-105**

Provides detailed descriptions of the procedures for monitoring, testing, and maintaining the systems. Included are maintenance commands, step-by-step trouble-clearing procedures, the procedures for using all tests, and explanations of the system’s error codes.

DEFINITY Enterprise Communications Server Release 5 — Overview, Issue 2, **555-230-024**

Provides a detailed overview of the system including descriptions of many of the major features, applications, hardware, system capabilities, and the support provided with the system.

DEFINITY Communications System Generic 3 Planning and Configuration, Issue 2, **555-230-601**

Provides step-by-step procedures for the account team in determining the customer's equipment and hardware requirements to configure a system according to the customer specifications. Includes detailed requirements and block diagrams. This document reflects Generic 3 Version 2 software, but still contains relevant information.

BCS Products Security Handbook, Issue 5, **555-025-600**

Provides information about the risks of telecommunications fraud and measures for addressing those risks and preventing unauthorized use of BCS products. This document is intended for telecommunications managers, console operators, and security organizations within companies.

DEFINITY Communications System and System 75 and System 85 Terminals and Adjuncts Reference, Issue 7, **555-015-201**

Provides descriptions of the peripheral equipment that can be used with System 75, System 85, DEFINITY Communications System, and DEFINITY ECS. This document is intended for customers and Lucent Technologies account teams for selecting the correct peripherals to accompany a system.

DEFINITY Communications System Generic 1, Generic 3, and System 75 Voice Terminal Guide Builder, Issue 3, **555-230-755**

Provides capability to produce laser-printed documentation for specific voice terminals. The software is supported by a comprehensive user's guide and on-line help. This product requires a 386 PC, minimum of 6MB disk space, minimum of 4MB RAM, a printer supported by Microsoft GDI printer drive, and Microsoft Windows 3.1 or higher. A mouse is recommended.

Call Center

The following list of documents are Call-Center specific.

DEFINITY

***DEFINITY Enterprise Communications Server Release 5 — Call Vectoring/EAS Guide, Issue 1*, 585-230-521**

Provides information on how to write, use, and troubleshoot vectors, which are command sequences that process telephone calls in an Automatic Call Distribution (ACD) environment. It is provided in two parts: tutorial and reference.

The tutorial provides step-by-step procedures for writing and implementing basic call vector scripts.

The reference includes detailed descriptions of the call vectoring features, vector management, vector administration, adjunct routing, troubleshooting, and interactions with management information systems (including the Call Management System).

***DEFINITY Enterprise Communications Server Release 5 — Basic Call Management System (BCMS) Operations, Issue 1*, 555-230-706**

Provides detailed instructions on how to generate reports and manage the system and is intended for telecommunications managers who wish to use Basic Call Management System (BCMS) reports and system managers responsible for maintaining the system.

CentreVu CMS

***CentreVu Call Management System Release 3 Version 5 — Administration, Issue 1,* 585-215-820**

***CentreVu Call Management System Release 3 Version 5 — Reports, Issue 1,* 585-215-821**

***CentreVu Call Management System Release 3 Version 5 — Custom Reports, Issue 1,* 585-215-822**

***CentreVu Call Management System Release 3 Version 5 — Upgrades and Migrations, Issue 1,* 585-215-826**

***CentreVu Call Management System Release 3 Version 5 — External Call History Reference, Issue 1,* 585-215-824**

***CentreVu Call Management System Release 3 Version 5 — Forecast, Issue 1,* 585-215-825**

Networks

The following list of documents are network-specific.

***DEFINITY Communications System Generic 3 Wideband Technical Reference, Issue 1*, 555-230-230**

Provides detailed information regarding the Wideband Switching feature for the system and is intended for users and technical support personnel involved with the installation, administration, and operation of this feature. This feature provides high speed end-to-end connectivity between customer endpoints where dedicated facilities are not economical or appropriate. The primary function is to support high speed video-conferencing and data applications.

***DEFINITY Communications System Generic 2.2 and Generic 3 Version 2 DS1/CEPT1/ISDN PRI Reference Manual, Issue 1*, 555-025-107**

Provides a detailed technical description of digital trunks in the DEFINITY Communications Systems. This includes trunks conforming to the DS1 standard (1.544 Mbps) and the CEPT1 standard and all other methods of signalling, including bit-oriented signalling as well as ISDN-PRI signalling. This document includes background information on these topics, information on how digital trunk capabilities have been designed into the DEFINITY Communications System and information for field personnel and customers on how to provision and administer digital trunk capabilities and features. Provides both domestic and international information.

Application Specific Documents

The following list of documents are application-specific.

***DEFINITY Enterprise Communications Server Generic 2 to Release 5 — Transition Reference, Issue 1,* 555-230-622**

Provides information on the differences in features and administration between the old and new systems when upgrading from a Generic 2 system to DEFINITY ECS.

ASAI

***DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Planning Guide, Issue 5*, 555-230-222**

Provides procedures and directions for the account team and customer personnel for effectively planning and implementing the CallVisor Adjunct/Switch Application Interface (ASAI) PBX-Host environment. The CallVisor ASAI is a communications interface that allows adjunct processors to access switch features and to control switch calls. It is implemented using an Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI). Included are hardware and software requirements.

***DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Protocol Reference, Issue 5*, 555-230-221**

Provides detailed layer 3 protocol information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the library or driver programmer of an adjunct processor to create the library of commands used by the applications programmers. Describes the ISDN message, facility information elements, and information elements.

***DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Technical Reference, Issue 5*, 555-230-220**

Provides detailed information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the application designer responsible for building and/or programming custom applications and features.

***DEFINITY Enterprise Communications Server Release 5 — Installation, Administration, and Maintenance of CallVisor ASAI Over the DEFINITY LAN Gateway, Issue 2*, 555-230-223**

Provides procedures for installation, administration, and maintenance of the CallVisor Adjunct/Switch Application Interface (ASAI) Ethernet application over the DEFINITY LAN Gateway and is intended for system administrators, telecommunications managers, Management Information System (MIS) managers, LAN managers, and Lucent personnel. The ASAI-Ethernet application provides ASAI functionality using 10Base-T Ethernet rather than BRI as a transport media.

DEFINITY Enterprise Communications Server Release 5 — Overview, Issue 2, **555-230-225**

DEFINITY Enterprise Communications Server Release 5 — CallVisor PC ASAI Installation and Reference, Issue 3, **555-246-205**

ACD

DEFINITY Enterprise Communications Server Release 5 — Automatic Call Distribution (ACD) Agent Instructions, Issue 5, **555-230-722**

Provides information for use by agents after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

DEFINITY Enterprise Communications Server Release 5 — Automatic Call Distribution (ACD) Supervisor Instructions, Issue 4, **555-230-724**

Provides information for use by supervisors after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

Console Operations

DEFINITY Communications System Generic 1 and Generic 3 Console Operations, Issue 2, **555-230-700**

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call-handling procedures, basic system troubleshooting information, and routine maintenance procedures.

DEFINITY Enterprise Communications Server Release 5 — Console Operations Quick Reference, Issue 2, **555-230-890**

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call handling, basic system-troubleshooting information, and routine maintenance procedures. This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Colombian Spanish (SPL), and Japanese (JA).

To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

Hospitality

***An Introduction to DEFINITY Communications System Generic 3 Hospitality Services, Issue 1*, 555-230-021**

Provides an overview of the features available for use by the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Included are brief definitions of many of the system features, descriptions of the hardware, planning considerations, and list of the system capabilities.

***DEFINITY Communications System Generic 1 and Generic 3 Hospitality Operations, Issue 2*, 555-230-723**

Provides step-by-step procedures for using the features available for use by the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Includes detailed descriptions of reports.

Abbreviations

A

AA
Archangel

AAC
ATM Access Concentrator

AAR
Automatic Alternate Routing

AC
Alternating Current

ACA
Automatic Circuit Assurance

ACB
Automatic Callback

ACD
Automatic Call Distribution

ACU
Automatic Call Unit

ACW
After Call Work

AD
Abbreviated Dialing

ADAP
AUDIX Data Acquisition Package

ADM
Asynchronous Data Module

ADU
Asynchronous Data Unit

AE
Access Endpoint

AG
ASAI Gateway

AIM
Asynchronous Interface Module

AIOD
Automatic Identification of Outward Dialing

ALBO
Automatic Line Build Out

ALM-ACK
Alarm Acknowledge

AMW
Automatic Message Waiting

AN
Analog

ANI
Automatic Number Identification

AOL
Attendant Offered Load

AP
Applications Processor

APLT
Advanced Private Line Termination

ARS
Automatic Route Selection

ASAI
Adjunct Switch Applications Interface

ASCII
American Standard Code for Information Interchange

ATB
All Trunks Busy

ATD
Attention Dial

ATM
Asynchronous Transfer Mode

ATMS
Automatic Transmission Measurement System

AUDIX
Audio Information Exchange

AUX
Auxiliary

AVD
Alternate Voice/Data

AWOH
Administration Without Hardware

AWT
Average Work Time

B

BCC
Bearer Capability Class

BCMS
Basic Call Management System

BCT
Business Communications Terminal

BER
Bit Error Rate

BHCC
Busy Hour Call Completions

BLF
Busy Lamp Field

BN
Billing Number

BOS
Bit Oriented Signaling

BPN
Billed Party Number

bps
Bits Per Second

BRI
Basic Rate Interface

BTU
British Thermal Unit

B8ZS
Bipolar Eight Zero Substitution

C

CA-TSC
Call-Associated Temporary Signaling Connection

CACR
Cancellation of Authorization Code Request

CAG
Coverage Answer Group

CAMA
Centralized Automatic Message Accounting

CARR-POW
Carrier Port and Power Unit for AC Powered Systems

CAS
Centralized Attendant Service or Call Accounting System

CBC
Coupled Bonding Conductor

CC
Country Code

CCIS
Common Channel Interoffice Signaling

CCITT
Consultative Committee for International Telephone and Telegraph

CCMS
Control Channel Message Set

CCS
Centum (Hundred) Call Seconds

CCSA
Common Control Switching Arrangement

CDM
Channel Division Multiplexing

CDOS
Customer-Dialed and Operator Serviced

CDR
Call Detail Recording

CDRP
Call Detail Record Poller

CDRR
Call Detail Recording and Reporting

CDRU
Call Detail Recording Utilities

CEM
Channel Expansion Multiplexing

CEPT1
European Conference of Postal and Telecommunications Rate 1

CI
Clock Input

CISPR
International Special Commitee on Radio Interference

cm
Centimeter

CM
Connection Manager

CMDR
Centralized Message Detail Recording

CMS
Call Management System

CO
Central Office

COR
Class of Restriction

COS
Class of Service

CP
Circuit Pack

CPE
Customer Premises Equipment

CPN
Called-Party Number

CPN/BN
Calling Party Number/Billing Number

CPTR
Call Progress Tone Receiver

CRC
Cyclical Redundancy Checking

CSA
Canadian Safety Association

CSCC
Compact Single Carrier Cabinet

CSCN
Center Stage Control Network

CSD
Customer Service Document

CSM
Centralized System Management

CSS
Center Stage Switch

CSSO
Customer Services Support Organization

CSU
Channel Service Unit

CTS
Clear to Send

CWC
Call Work Codes

D

DAC
Dial Access Code or Direct Agent Calling

dB
Decibel

dBA
Decibels in reference to Amperes

dBrnC
Decibels above reference noise with C filter

DC
Direct Current

DCE
Data Communications Equipment

DCO
Digital Central Office

DCP
Digital Communications Protocol

DCS
Distributed Communications System

DDC
Direct Department Calling

DDD
Direct Distance Dialed

DID
Direct Inward Dialed

DIOD
Direct Inward and Outward Dialing

DIVA
Data In/Voice Answer

DLC
Data Line Circuit

DLDM
Data Line Data Module

DMI
Digital Multiplexed Interface

DND
Do Not Disturb

DNIS
Dialed Number Identification Service

DOD
Direct Outward Dialing

DOSS
Delivery Operations Support System

DOT
Duplication Option Terminal

DPM
Dial Plan Manager

DPR
Dual Port RAM

DS1
Digital Signal Level 1

DS1C
Digital Signal Level-1 protocol C

DSI
Digital Signal Interface

DSU
Data Service Unit

DTDM
Digital Terminal Data Module

DTE
Data Terminal Equipment

DTGS
Direct Trunk Group Select

DTMF
Dual-Tone Multi-Frequency

DTS
Disk Tape System

DXS
Direct Extension Selection

E

E & M
Ear and Mouth (receive and transmit)

EAA
Expansion Archangel

EAL
Expansion Archangel Link

EBCDIC
Extended Binary-Coded Decimal Interexchange Code

ECC
Error Correct Code

ECMA
European Computer Manufacturers Association

EFP
Electronic Power Feed

EI
Expansion Interface

EIA
Electronic Industries Association

EMI
Electro-Magnetic Interference

EPN
Expansion Port Network

EPROM
Erasable Programmable Read Only Memory

EPSCS
Enhanced Private Switched Communications Services

ERL
Echo Return Loss

ESF
Extended Superframe Format

ESPA
European Standard Paging Access

ETA
Extended Trunk Access, also Enhanced Terminal Administration

ETN
Electronic Tandem Network

ETSI
European Telecommunications Standards Institute

F

FAC
Feature Access Code

FAS
Facility-Associated Signaling

FAT
Facility Access Trunk

FAX
Facsimile

FCC
Federal Communications Commission

FEAC
Forced Entry of Account Codes

FEP
Front End Processor

FIC
Facility Interface Codes

FNPA
Foreign Numbering-Plan Area

FRL
Facilities Restriction Level

FX
Foreign Exchange

G

G3-MA
Generic 3 Management Applications

G3-MT
Generic 3 Management Terminal

GM
Group Manager

GPTR
General-Purpose Tone Receiver

GRS
Generalized Route Selection

H

HNPA
Home Numbering Plan Area Code

Hz
Hertz

I

IAS
Inter-PBX Attendant Service

IC
Inter-Cabinet

ICC
Intercarrier Cable

ICD
Inbound Call Director

ICDOS
International Customer Dialed Operator Serviced

ICHT
Incoming Call-Handling Table

ICI
Incoming Call Identifier

ICM
Inbound Call Management

IDDD
International Direct Distance Dialing

IDF
Intermediate Distribution Frame

IE
Information Element

IMT
Intermachine Trunk

INADS
Initialization and Administration System

INS
ISDN Network Service

INWATS
Inward Wide Area Telephone Service

IO
Information Outlet

ISDN
Integrated Services Digital Network

IS/DTT
Integrated Services/Digital Tie Trunk

ISN
Information Systems Network

ISO
International Standards Organization

ISV
Independent Software Vendor

ITP
Installation Test Procedures

ITU
International Telecommunications Union

IXC
Interexchange Carrier Code

K

kB
Kilobyte

kHz
Kilohertz

kbps
Kilobits Per Second

kbyte
Kilobyte

kg
Kilogram

L

LAN
Local Area Network

LAP-D
Link Access Procedure on the D-channel

LAPD
Link Access Procedure Data

LATA
Local Access and Transport Area

lb
Pound

LBO
Line Build Out

LDN
Listed Directory Number

LDS
Long-Distance Service

LEC
Local Exchange Carrier

LED
Light Emitting Diode

LINL
Local Indirect Neighbor Link

LMM
Low Level Maintenance Monitor

LSU
Local Storage Unit

LWC
Leave Word Calling

M

MAC
Medium Access

M-Bus
Memory Bus

MA-UUI
Message Associated User-to-User Signaling

MADU
Modular Asynchronous Data Unit

MAP
Maintenance Action Process

MAPD
Multi-Application Platform for DEFINITY

Mbps
Megabits Per Second

MCC
Multi-Carrier Cabinet

MCS
Message Center Service

MCT
Malicious Call Trace

MCU
Multipoint Control Unit

MDF
Main Distribution Frame

MDM
Modular Data Module

MDR
Message Detail Record

MEM
Memory

MET
Multibutton Electronic Telephone

MF
Multi-Frequency

MFB
Multifunction Board

MFC
Multi-Frequency Compelled (Signaling)

MHz
Megahertz

MIM
Management Information Message

MIPS
Million Instructions Per Second

MIS
Management Information System

MISCID
Miscellaneous Identification

MMCH
Multimedia Call Handling

MMCX
Multimedia Communications Exchange

MMI
Multimedia Interface

MMS
Material Management Services

MO
Maintenance Object

MOS
Message-Oriented Signaling

MPDM
Modular Processor Data Module

MS
Message Server

ms
Millisecond

MS/T
Main Satellite/Tributary

MSA
Message Servicing Adjunct

MSG
Message Service

MSM
Modular System Management

MSS
Mass Storage System

MSSNET
Mass Storage/Network Control

MT
Management Terminal

MTDM
Modular Trunk Data Module

MTP
Maintenance Tape Processor

MTT
Multi-Tasking Terminal

MWL
Message Waiting Lamp

N

NANP
North American Numbering Plan

NAU
Network Access Unit

NCA/TSC
Non-Call Associate/Temporary Signaling Connection

NCOSS
Network Control Operations Support Center

NCSO
National Customer Support Organization

NEC
National Engineering Center

NEMA
National Electrical Manufacturer’s Association

NETCON
Network Connection Circuit Pack

NFAS
Non-Facility Associated Signaling

NI
Network Interface

NID
Network Inward Dialing

NM
Network Management

NN
National Number

NPA
Numbering Plan Area

NPE
Network Processing Element

NQC
Number of Queued Calls

NSE
Night Service Extension

NSU
Network Sharing Unit

NXX
Public Network Office Code

O

OA
Operator Assisted

OCM
Outbound Call Management

ONS
On-Premises Station

OPS
Off-Premises Station

OPX
Off Premises Extension

OQT
Oldest Queued Time

OSHA
Occupational Safety and Health Administration

OSI
Open Systems Interconnect

OSS
Operations Support System

OSSI
Operational Support System Interface

OTDR
Optical Time Domain Reflectometer

OTQ
Outgoing Trunk Queuing

P

PACCON
Packet Control

PAD
Packet Assembly/Disassembly

PBX
Private Branch Exchange

PC
Personal Computer

PCM
Pulse Code Modulation

PCOL
Personal Central Office Line

PCOLG
Personal Central Office Line Group

PCS
Permanent Switched Calls

PDM
Processor Data Module

PDS
Premises Distribution System

PE
Processing Element

PEC
Price Element Codes

PEI
Processor Element Interchange

PGATE
Packet Gateway

PGN
Partitioned Group Number

PI
Processor Interface

PIB
Processor Interface Board

PIDB
Product Image Database

PKTINT
Packet Interface

PL
Private Line

PLS
Premises Lightwave System

PMS
Property Management System

PN
Port Network

PNA
Private Network Access

POE
Processor Occupancy Evaluation

POP
Point Of Presence

PPM
Parts Per Million or Periodic Pulse Metering

PPN
Processor Port Network

PRI
Primary Rate Interface

PROCR
Processor

PSC
Premises Service Consultant

PSDN
Packet Switch Public Data Network

PT
Personal Terminal

PTC
Positive Temperature Coefficient

PTT
Postal Telephone and Telegraph

R

RAM
Random Access Memory

RBS
Robbed-Bit Signaling

RC
Radio Controller

RCL
Restricted Call List

REN
Ringer Equivalency Number

RFP
Request For Proposal

RHNPA
Remote Home Numbering Plan Area

RINL
Remote Indirect Neighbor Link

RISC
Reduced Instruction Set Computer

RLT
Release Link Trunk

RMATS
Remote Maintenance, Administration, and Traffic System

RNX
Route Number Index (Private Network Office Code)

ROM
Read-Only Memory

RPN
Routing Plan Number

RS-232C
Recommended Standard 232C

RS-449
Recommended Standard 449

RSC
Regional Support Center

S

SABM
Set Asynchronous Balance Mode

SAC
Send All Calls

SAKI
Sanity and Control Interface

SAT
System Access Terminal

SCC
Single Carrier Cabinet or Serial Communications Controller

SCD
Switch-Control Driver

SCI
Switch Communications Interface

SCO
System Control Office

SCOTCH
Switch Conferencing for TDM Bus in Concentration Highway

SCSI
Small Computer System Interface

SDDN
Software Defined Data Network

SDI
Switched Digital International

SDLC
Synchronous Data Link Control

SDN
Software Defined Network

SFRL
Single-Frequency Return Loss

SID
Station Identification Number

SIT
Special Information Tones

SMDR
Station Message Detail Recording

SMM
Standby Maintenance Monitor

SN
Switch Node

SNA
Systems Network Architecture

SNC
Switch Node Clock

SNI
Switch Node Interface

SNMP
Simple Network Management Protocol

SPE
Switch Processing Element

SPID
Service Profile Identifier

SSI
Standard Serial Interface

SSM
Single Site Management

SSV
Station Service

ST3
Stratum 3 Clock Board

STARLAN
Star-Based Local Area Network

SVN
Security Violation Notification

SWG
Standard Wire Gauge

SXS
Step-by-Step

SYSAM
System Access and Administration

T

TAAS
Trunk Answer from Any Station

TABS
Telemetry Asynchronous Block Serial

TAC
Trunk Access Code

TC
Technical Consultant

TCM
Traveling Class Mark

TDM
Time Division Multiplex(ing)

TDR
Time of Day Routing

TEG
Terminating Extension Group

TEI
Terminal Endpoint Identifier

TGE
Incoming Tie Trunk (Italian)

TGU
Outgoing Tie Trunk (Italian)

TOD
Time of Day

TOP
Task Oriented Protocol

TSC
Technical Service Center

TTR
Touch-Tone Receiver

TTT
Terminating Trunk Transmission

TTTN
Tandem Tie Trunk Network

TTY
Teletypewriter

U

UAP
Usage Allocation Plan

UART
Universal Asynchronous Transmitter

UCD
Uniform Call Distribution

UCL
Unrestricted Call List

UDP
Uniform Dial Plan

UL
Underwriter Laboratories

UM
User Manager

UNMA
Unified Network Management Architecture

UNP
Uniform Numbering Plan

UPS
Uninterruptible Power Supply

USOP
User Service Order Profile

UUCP
UNIX-to-UNIX Communications Protocol

UUI
User-to-user information

V

VAR
Value Added Reseller

VDN
Vector Directory Number

VIS
Voice Information System

VLSI
Very Large Scale Integration

VM
Voltmeter

VNI
Virtual Nodepoint Identifier

W

WATS
Wide Area Telecommunications Service

WCC
World Class Core

WCR
World Class Routing

WCTD
World Class Tone Detection

WFB
Wireless Fixed Base

WSA
Waiting Session Accept

WSS
Wireless Subscriber System

Z

ZCS
Zero Code Suppression

Index

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A

ACA, see Automatic Circuit Assurance
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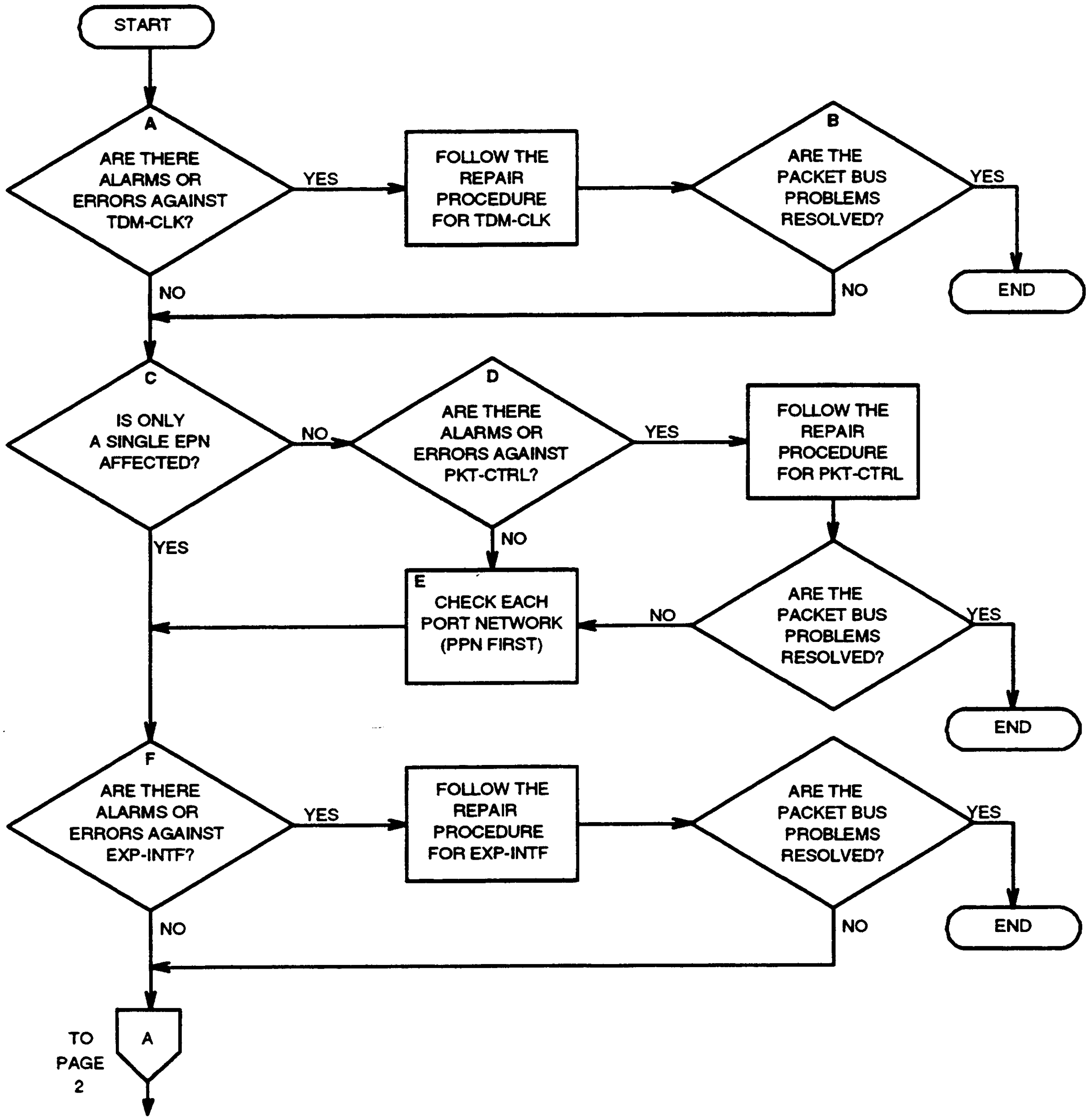

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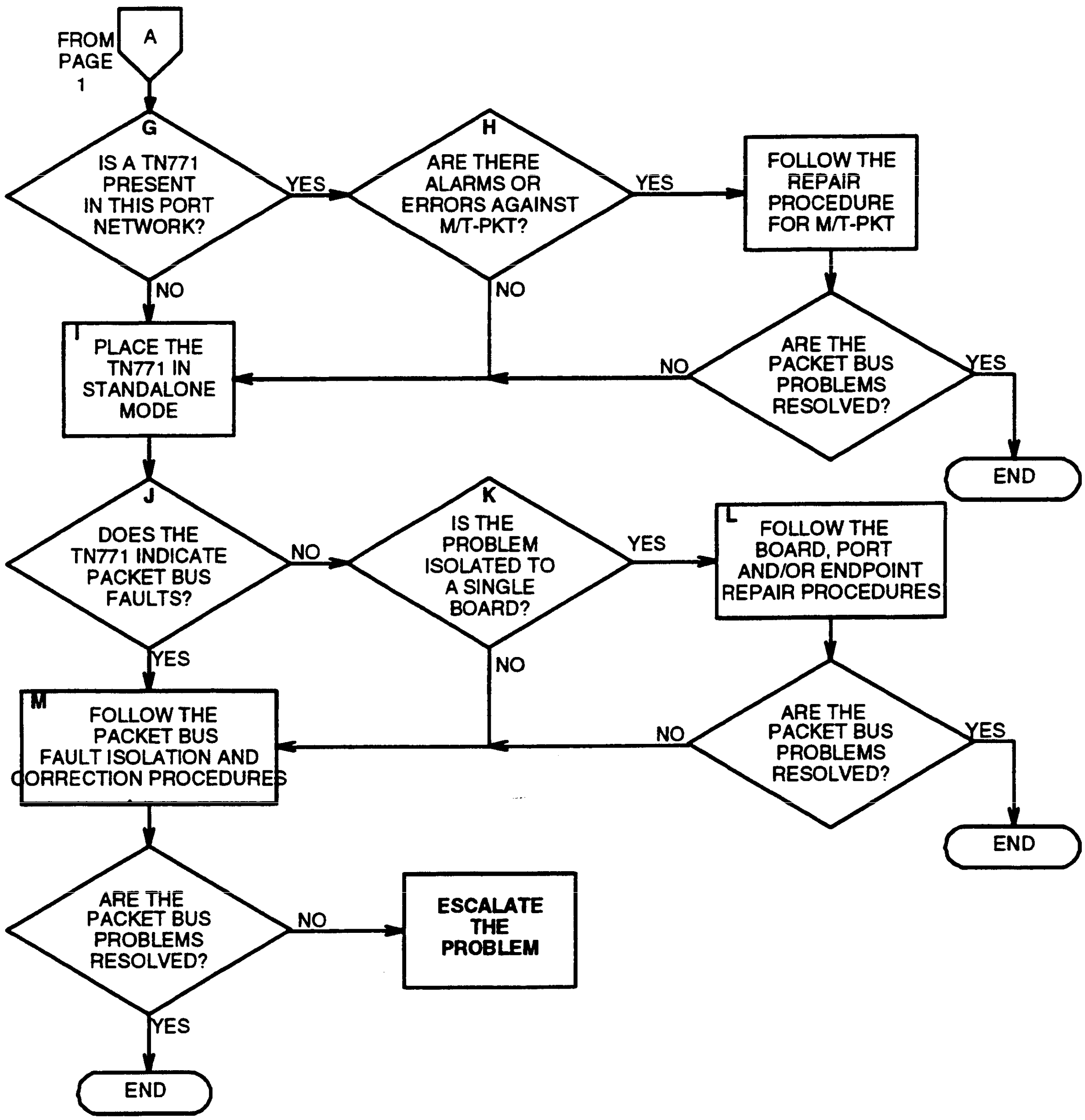

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