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DACS II
Release 8.0 PDS
2.048-Mb/s Interface
Operation and Maintenance Manual

Volume I - Acceptance and
Operation

365-353-141
Issue 1
November 1997

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Document Title: DACS II Release 8.0 PDS 2.048-Mb/s Interface Operation and Maintenance
Manual Volume I - Acceptance and Operation

Document No.: 365-353-141

Issue 1

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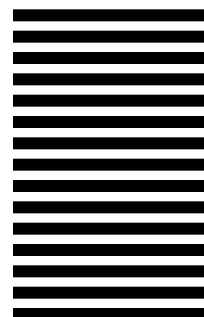
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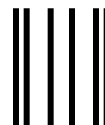
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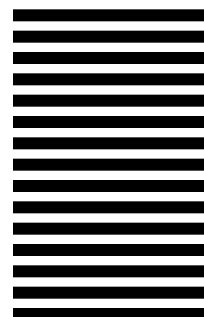
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About This Document

Purpose

This document provides procedural information required to support the craft personnel activities involved in the daily operation and maintenance of the DACS II (Digital Access and Cross-Connect System II). It also includes an overview that describes the physical and functional attributes of the DACS II. This volume contains the procedures to isolate and clear troubles.

Intended Audiences

This document is for individuals who are responsible for the acceptance, provisioning, operation, and maintenance of the DACS II system, Release 8.0.

How to Use This Document

Before you attempt to use the procedures in this document you should become familiar with its contents. The contents are described below.

The document is divided into two volumes:

- Volume I - Operation and Maintenance and Reference Information
- Volume II - Trouble Clearing

With the exception of the reference information contained in Volume I, each of the volumes stands on its own. The reference information applies to both volumes.

There are three ways to access the information in this document:

- The index in the back of each volume
- The tabs and the table of contents in the front of each tab
- The overall table of contents in the front of each volume.

Before you use the procedures in this document, you should have completed the DACS II Operation and Maintenance course (TR3521). If you were not able to take the training course, you should carefully study the information in Chapter 1 and the *Command Denials* section (found in each volume).

The procedures are arranged to be performed in the sequence in which they are presented. If you perform a procedure out of sequence, you may have trouble performing that procedure and the subsequent procedures.

Always start the trouble-clearing process by performing the procedures in Chapter 1 *Trouble Identification* of Volume II. The sections in Volume II are functional groupings of troubles. It is not always obvious from the message or alarm which of the trouble sections provides the procedure or procedures for clearing the trouble. If you begin with Chapter 1, you will be directed from procedure to procedure until the trouble is cleared.

Contents

Volume I

■ Chapter 1 - Introduction

This chapter provides an overview of the DACS II. It describes the DACS II hardware arrangements, functional operation, and command and message set. This chapter contains reference information required to operate and maintain the DACS II.

■ Chapter 2 - Acceptance

This chapter contains all the procedures required to accept a DACS II frame after it has been installed.

■ Chapter 3 - Provisioning

This chapter provides the procedures to install circuit packs and to grow and enable the common equipment (frame, synchronizer, and cross-connect network) and Units (FTU, DS3U, HDS3U, and DSPU).

Included are the procedures to install circuit packs and to grow and enable the NPCs (FTU with or without *SLC*® Carrier, DS3U, HDS3U, and DSPU, Subrate, or DMB).

Also included are the procedures to make the DSX connections and perform tests to establish DS1 facilities with or without *SLC* Carrier, DS3 and Hybrid DS3 facilities, and Subrate channels.

■ Chapter 4 - Test Access

This chapter contains the procedures to establish the test ports, make the DS0 and Clear-DS1 test connections, and establish and test-subrate channels.

■ Chapter 5 - Remove and Degrow Equipment

This chapter contains the procedures to remove and degrow NPCs, units, and cross-connect networks.

■ **Chapter 6 - Cross-Connections and Disconnections**

This chapter contains the procedures to make DS0, Clear-E1, Channelized-E1, Nx64 and Subrate cross-connections and to disconnect the cross-connections.

■ **Chapter 7 - Administration**

This chapter contains the procedures to log on or log off the DACS II; create, change, and delete alternate maps; and create, activate, and delete macros.

■ **Chapter 8 - Maintenance**

This chapter contains the procedures for routine PMEM and SMEM memory card maintenance, PMEM and SMEM card removal, and plug-in removal and replacement.

■ **Chapter 9 - Performance Monitoring**

The procedures in this chapter tell you how to schedule and retrieve reports that monitor various DS1 performance parameters.

■ **Chapter 10 - C-Bit Processing**

This chapter contains the procedures to connect/disconnect facility channels to C-bit processor and to select C-bit processing functions.

■ **Chapter 11 - Command Denials**

This chapter lists the command denial codes and their meanings. This information is useful in determining problems with the DACS II. You should be familiar with the contents of this chapter before you attempt any of the other procedures.

Volume II

■ Chapter 1 - Trouble Identification

This chapter contains the procedures for interpreting the alarms and messages that identify troubles. ***All trouble clearing starts here. You are directed from here to a procedure in one of the following chapters. That procedure may direct you to a procedure in a chapter that follows it. The process continues until you isolate the fault.***

■ Chapter 2 - Power Failures

This chapter contains the procedures for isolating power troubles.

■ Chapter 3 - Facility Alarms

This chapter contains the procedures for isolating troubles in the facilities that connect to DACS II.

■ Chapter 4 - Hardware Failures

This chapter contains procedures for locating internal DACS II troubles. The messages associated with these troubles usually identify one or more possible faulty plug-ins.

■ Chapter 5 - Manual Diagnostic Failures

This chapter contains the procedures for clearing troubles identified when you run manual diagnostics.

■ Chapter 6 - Controller and Link Troubles

The procedures in this chapter are used to isolate troubles in the controller or the link connecting the controller to a terminal or operating system. These troubles are usually associated with a reset.

■ Chapter 7 - Data Base Troubles

The procedures in this chapter are used to isolate a conditional reset or back-up memory trouble.

■ Chapter 8 - Frame Audits

The procedures in this chapter are used to isolate faults detected when frame audits are run.

■ Chapter 9 - Software Error

The procedures in this chapter are used to isolate troubles indicated by a software trouble message.

■ Chapter 10 - TS0 and C-Bit Messages

The procedures in this chapter tell you how to respond to messages that indicate changes in the status of TS0 or C-bit register or an overflow in the TS0 or C-bit buffers.

■ **Chapter 11 - Command Denials**

This chapter lists the command denial codes and their meanings. This information is useful in determining problems with the DACS II.

Conventions Used

This manual uses special fonts in order for the user to differentiate computer input/output. The constant width font indicates message formats, keywords, letter representations of parameters, parameter values, and messages as they would appear on a DACS II terminal screen.

Related Documentation

The following documents support the DACS II system:

- DACS II Release 8.0 Installation Manual:

- IPH903 (DACS II CEF)
- IPH903I (DACS II ESBF)

Audience: Customers planning to install the equipment

Content: Customer installation instructions.

- DACS II Release 8.0 Product Description Manuals:

- 365-353-120 (24 Channel)
- 365-353-140 (30 Channel)

Audience: Network planners, engineers, and others that need to know how the DACS II works and fits into the network

Content: Features, applications, and description and other reference information.

- DACS II Release 8.0 Operation and Maintenance Manuals:

- 365-353-121 (PDS)
- 365-353-131 (MML)
- 365-353-141 (PDS 2.048-Mb/s Interface)
- 365-353-151 (MML 2.048-Mb/s Interface)

Audience: End-user maintenance personnel

Contents: Procedures to operate and maintain the DACS II.

■ DACS II Release 8.0 Command and Message Manuals:

- 365-353-122 (PDS)
- 365-353-132 (MML)
- 365-353-142 (PDS 2.048-Mb/s Interface)
- 365-353-152 (MML 2.048-Mb/s Interface).

Audience: End-user maintenance personnel

Content: Description of each software input message and its response along with a description of each system output report.

■ DACS II Release 8.0 Quick Reference Guides:

- 365-353-123 (PDS)
- 365-353-133 (MML)
- 365-353-143 (PDS 2.048-Mb/s)
- 365-353-153 (MML 2.048-Mb/s)

Audience: End-user maintenance personnel

Content: Abbreviated list of system commands and parameters.

■ DACS II Release 8.0, Software Release Description:

- Com. Code CC108164492

Audience: End-user maintenance personnel

Content: Upgrade procedures for the new software release, status of problems fixed in previous releases, and operating issues for the specified software release.

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Introduction

1

DACS II Overview

The DACS II is the current generation of equipment for access and cross-connection of DS0 (digital signal level 0) channels. DS0 channels are defined as 64-kb bandwidth channels produced by pulse code modulation (PCM). The DACS II is software-based equipment. The DACS II has both main and secondary controllers, centralized and distributed memory, and single-stage, nonblocking timeslot interchange circuitry. Small and large frame complexes and modular equipment design allow the DACS II to be economically deployed in both large and small installations.

The name Digital Access and Cross-Connect System describes the main function of DACS II. It accesses DS0 information channels in the digital signals connected to it. These digital signals are 2.048 Mb/s signals. This access allows cross-connecting of DS0 channels without decoding them to analog and allows channels to be brought outside the DACS II for testing. These cross-connect and test-access operations are initiated by commands entered on an administrative link.

DACS II uses a process called time slot interchange to electronically cross-connect single DS0 (64-kb/s) channels or any continuous range of up to 32 channels (2.048 Mb/s facility, NSA format) within the DACS II cross-connect network. When three bays are equipped to terminate 512 DS1 facilities (original interface bays), it can connect all 15,360 DS0 channels in various cross-connect circuit configurations. If the capacity expansion frame (CEF) is equipped for 2,048 2.048 Mb/s facilities, the DACS II can connect all 61,440 DS0 channels.

Up to four facility interfaces per frame can be reserved for DS0 test access. DACS II allows test access of any channel within a facility without interfering with any other channel. You can test with standard test equipment locally at the distributing frame or test from a remote location.

DACS II also monitors the performance of connecting 2.048 Mb/s facilities, checking for loss of signal and transmission errors. Additional facility parameters are monitored using different error-checking schemes. Facility performance is reported in a daily summary message and on demand by entering a command. If the errors or counted activities exceed prescribed thresholds, the DACS II initiates office and remote alarms and/or alarm messages over the administrative links.

The 2.048 Mb/s interface feature offers additional network processing circuit (NPC) growth options and additional commands to control TS0 monitoring and supports the use of the C-bit processor (CPR) pack. The TS0 monitoring involves growing the NPC with the spare bits in TS0 designed to represent remote alarm information in alarm messages. The alarm assignments are compatible with those for connecting TRANSMIC 1G and 2G equipment used in some countries. Commands also allow monitoring other spare TS0 bits which can be used to carry miscellaneous alarm information and specify the normal state of the bits so that a change will produce an information message.

Physical Description

The paragraphs which follow describe the various frame, bay, unit, and circuit pack configurations offered by DACS II.

Frame Configurations

Figure 1-1 shows the DACS II frames covered in this manual and the software releases associated with each.

Table 1-1 lists the units that make up the frames. Table 1-2 lists the circuit packs in each unit.

With the exception of the single-bay frame, each frame is made up of one switch bay and one or more interface bays. The single-bay frame provides both switch and interface functions in a single frame. The switch bay contains the cross-connect network(s), synchronizer, main controller and backup memories. There are two types of interface bay. They are the original interface bay and the flexible interface bay. The original interface bay refers to interface bays that were provided before the flexible interface bay was available.

Single-Bay Frame

The single-bay frame, Figure 1-2, contains the units listed in Table 1-1. The single-bay frame contains many of the same circuit packs that are used in multibay frames. Differences in the capacity, the cross-connect network (CCN), and location of circuit packs are accounted for in the software by the information contained in the data base configuration file.

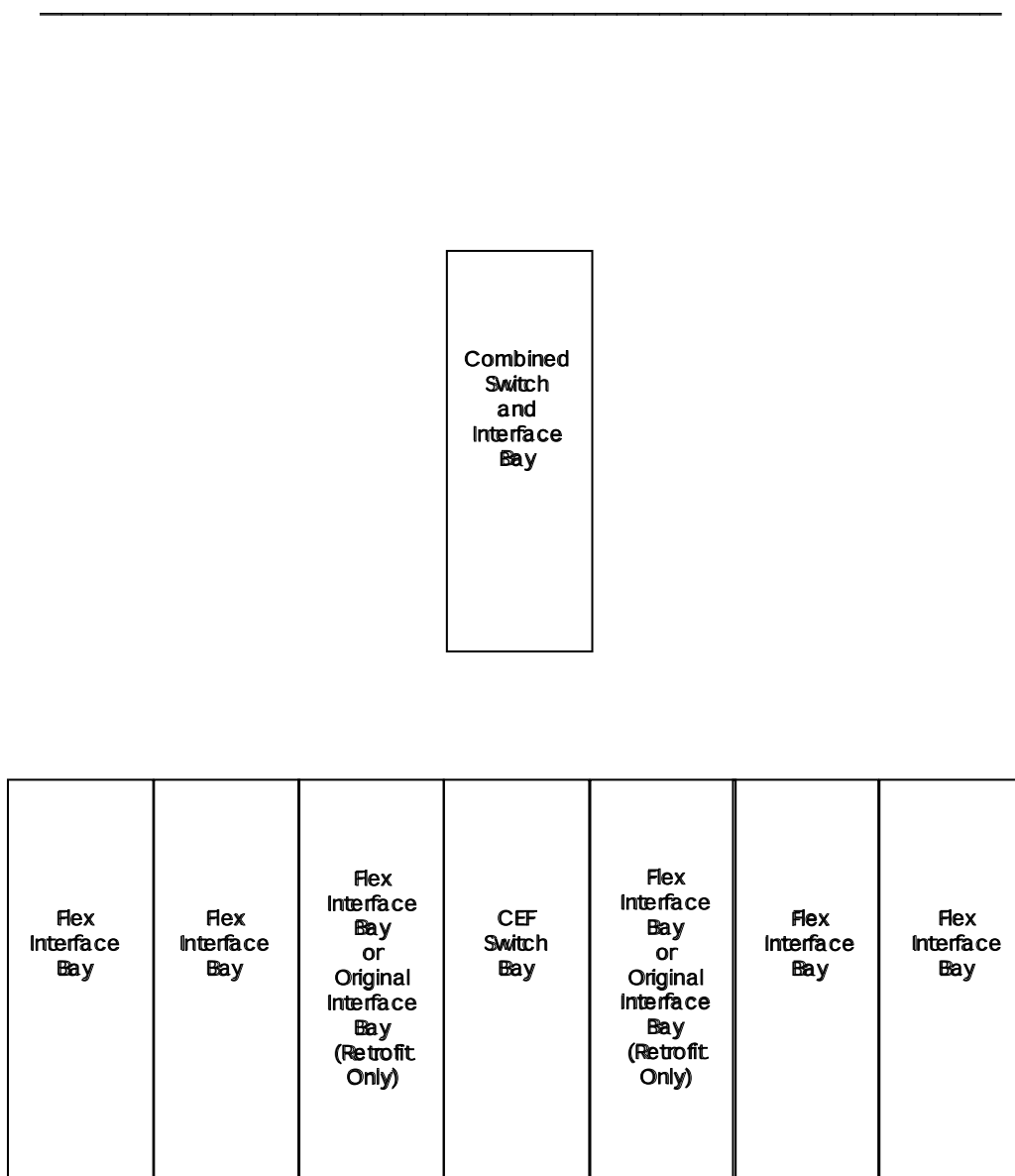


Figure 1-1. DACS II Frame Arrangements

Table 1-1. DACS II Frame/Bay/Unit Arrangements**FRAME TYPES**

Single-Bay Frame
Capacity Expansion Frame (CEF)

BAY TYPES

Switch Bays
Interface Bays
Single (Combination Switch and Interface Bay)

SWITCH BAYS

Original (one in each double- and triple-bay frame)
CEF (one in each CEF frame)

INTERFACE BAYS

Original (one in double-bay frames, two in triple-bay frames)
flexible (up to six in CEF frame)

SWITCH BAY UNITS**ORIGINAL SWITCH BAY**

CCN (0 and 1)
Status Panel
Synchronizer
MC (main controller)
CCN Power Unit (0 and 1)
Fuse and Alarm

CEF SWITCH BAY

ECCN (0 and 1)
Status Panel
Synchronizer
MC (main controller)
Fuse and Alarm

INTERFACE BAY UNITS**ORIGINAL INTERFACE BAY**

FTU (Maximum 2 per bay)
FTM
Power and Control
DSPU (Maximum 1 per bay)
DS3U (Maximum 1 per bay)
HDS3U (Maximum 1 per bay)

FLEXIBLE INTERFACE BAY (FLEX BAY)

IFTU (Maximum 3 per bay)
FTM
DSPU (Maximum 3 per bay)
DS3U (Maximum 3 per bay)
HDS3U (Maximum 3 per bay)

SINGLE-BAY UNITS

Fuse and Alarm
FTU
FTM
CCN (0 and 1)
Status Panel
MC and Sync
FTU Power and Control
DSPU/DS3U/HDS3U

Table 1-2. DACS II Circuit Pack Equipment

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)
FULL	ABBREV			
ORIGINAL SWITCH BAY				
<i>CCN (Cross-Connect Network)</i>				2 sides (0 and 1)
Time Slot Interchange	TSI	TM660	CCN	Up to 36 per side
Cross-Connect Buffer	CCB	UM26B	CCN	Up to 6 per side
Cross-Connect Network Interface	CCNI	UM30	CCN	1 per side
<i>Synchronizer</i>				1
(Time Base Slots) TB can be installed in TLI 3				
Time Bases-Stratum 3	TBS3	TG60	SYNC	2 or 3
Time Base CEPT Local	TBCL	TG61		of 1 code
Time Base CEPT Toll	TBCT	TG62		
(Timing Link Interface)	TLI		SYNC	Up to 8 Four 0 and 1 Pairs
Timing Extractor Function				Choose 2 of 1
Bipolar DS1	TXB1	TG64		or more codes.
Composite Clock 64 kb/s	TXCC	TG66		Selection based
Unipolar Clock	TXUC	TG67B		on the sync
CEPT 75-ohm Coax	TP75			
Timing Distributor Function				
Comp. Clock 64 kb/s out	TDCC	TG70		Choose 2 of 1 Code
Sine Wave 2.048 MHz out	TDS2	TG71B		as required
Digital Phase-Locked Loop	DPLL	TM590	SYNC	2 (0 and 1)
Synchronizer Power Unit	SPU	TG58 (5V)	SYNC	2 (0 and 1)

Continued on next page

Table 1-2. Continued

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)
FULL	ABBREV			
<i>Main Controller</i>				1
Main Controller Power	MCP	SM565 (±12V)	MC	1 (U)
Central Processing Unit 2	CPU2	TM778*	MC	1
High speed Enhanced Communications Interface	HECI	TM762*	MC	1
Maintenance Circuit	MTC	UM24/UM24B	MC	1
Bus Extender	BX(2)	UM27/UM72*	MC	1
Power Unit	PU	411AA, (5V)	MC	1
<i>CCN Power Unit</i>				2 (0 and 1)
Power Unit	PU	485AB PWR UNIT (5V)	CCN Power	8
Fuse Board	DSR FUSE BD	ED-2C863-30 G3,ACCN	CCN Power	4
CEF SWITCH BAY				
<i>ECCN</i>				
<i>(Cross-Connect Network)</i>				2 (0 and 1)
Bus Terminator	BT	BBR1	ECCN	4 Two 0 and 1 Pairs
Clock Control Interface	CCI	BBS1	ECCN	2 One 0 and 1 Pairs
Expanded TSI	ETSI	BBS2	ECCN	Up to 32 Sixteen 0 and 1 Pairs

Continued on next page

Table 1-2. Continued

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)	
FULL	ABBREV				
CEF SWITCH BAY (Contd)					
<i>Synchronizer</i> The synchronizer in the CEF switch bay uses the same circuit packs as the synchronizer in the original switch bay shown previously.					
<i>Main Controller</i> Main Controller Power Central Processing Unit 2* High-Speed Enhanced Communications Interface Maintenance Circuit* Bus Extender* Fuse Board		MCP CPU2 HECI EMTC EBX	SM565 (±12V) TM778 TM762 UM75 UM71 (+12V), 411AA (+5V) MC	EMC EMC EMC EMC EMC MC	1 1 1 1 1 1
<i>Status Panel</i> Status Circuit Pack		STATUS	ED-9C017-30	EMC	1 (F)

*New circuit pack CEF switch bay main controller.

Continued on next page

Table 1-2. Continued

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)
FULL	ABBREV			
INTERFACE BAYS				
<i>Power and Control Unit</i>				1
Central Processing Unit	CPU	TM657/TM657B	FTU	1
Unit Bus Extender	UBX	UM28	FTU	1
Power Unit	PU	411AA (5V)	FTU	3 per FTU
Fuse Board	DSR FUSE BD	ED-2C863-30 G1,A	FTU	2 (77-type)
Fuse Board	DSR FUSE BD	ED-2C863-30 G2,A	FTU	1
<i>FTU</i>				
NPC				1 or 2 per bay 2 in each of the following circuit packs
Dual Primary Circuit (120-ohm termination)	DPC	TG182	FTU	Up to 64
Dual Primary Circuit (75-ohm termination)	DPC	TG185	FTU	Up to 64
Dual Primary Circuit (Minor BER)	DPC	TG187	FTU	Up to 64
Enhanced Dual Primary Circuit	EDPC	TG192	IFTU2	Up to 64
Format Converter	FC	TG79	FTU	Up to 8 Four 0 and 1 Pairs
Facility Terminating Module Interface	FTMI	TG81	FTU	Up to 4
<i>IFTU</i>				
IFTU uses the same circuit packs as the FTU (shown above) plus the following circuit packs.				Up to 3 per bay
Central Processing Unit	CPU	TM657B	IFTU	1
Unit Bus Extender	UBX	UM28	IFTU	1
Fuse Board	DSR FUSE BD	ED-9C011-30	IFTU	16 (80-type)
Fuse Board	DSR FUSE BD	ED-9C012-30	IFTU	1 (80-type)
Power Unit	PU	411AA	FTU	3

Continued on next page

Table 1-2. Continued

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)
FULL	ABBREV			
INTERFACE BAYS (Contd)				
<i>IFTU</i>				Up to 3 per bay
IFTU2 uses the same circuit packs as the FTU (shown above) plus the following circuit packs.				
Central Processing Unit	CPU	TM657B	IFTU	1
Unit Bus Extender	UBX	UM28	IFTU	1
Fuse Board	DSR FUSE BD	ED-9C011-30	IFTU	16 (80-type)
Fuse Board	DSR FUSE BD	ED-9C012-30	IFTU	1 (80-type)
Power Unit	PU	484AA	FTU	3
<i>DSPU</i>				Up to 3 per bay
Digital Multipoint Bridge	DMB	TM665	DSPU	Up to 8 pairs 0 and 1
Central Processing Unit	CPU	TM657 or TM657B	DSPU	1
DSP Controller Power	DCP	SM566	DSPU	1
DSP Interface	DSPI	UM29	DSPU	1
Power Unit	PU	411AA	DSPU	2
Fuse Board	DSR FUSE BD	ED-2C863-30 G3, ACCN	DSPU	1

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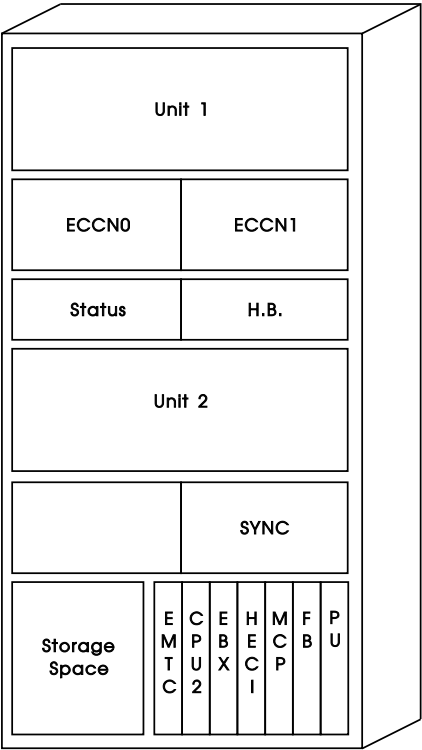
Table 1-2. Continued

FUNCTION NAME		CKT PACK	USED IN/WITH	NUMBER REQUIRED PER FRAME OR UNIT (U)
FULL	ABBREV			
<i>HDS3U</i>				Up to 3 per bay
HDS3 Multiplexer	MXR	KCR8	HDS3U	Up to 7
HDS3 Facility Line Interface	FLI	KCR4	HDS3U	2
Formatter	FMT	KER5	HDS3U	2
Unit Controller	UC	KER6-2	HDS3U	1
Power Unit	PU	563A PWR UNIT	HDS3U	3
Fuse Board	DSR FUSE BD	ED-2C980-30	HDS3U	1

Single Bay Frame

CCN2 [Cross-Connect Network] Use same circuit packs as original
Synchronizer Master Controller switch bay units

FTU Use same circuit packs as
FTU Power and Control original Interface
DSPU Bay units



Notes:
SYNC = Synchronizer
ECCN = Enhanced Cross-Connect Network
EMTC = Expanded Maintenance Circuit
CPU2 = Central Processing Unit 2
EBX = Enhanced Bus Extender
HECI = High Speed Enhanced Communications Interface
MCP = Main Controller Processor
FB = Fuse Board
PU = Power Unit

Figure 1-2. Single-Bay Frame Arrangement

Capacity Expansion Frame

The capacity expansion frame (CEF), Figure 1-3, consists of the CEF switch bay and up to six interface bays. The bays are always numbered as shown in Figure 1-3. The minimum starting configuration is the switch bay (bay 2) and one interface bay in the bay 1 position. It is not necessary to add the bays in numerical sequence. Bay 4 can be added before bay 3. There will never be more than 2 units (IFTU, DSPU, or HDS3U) in bays 6 and 7. Only flexible interface bays are used in new installations. In retrofit configurations, bays 1 and 3 could be original interface bays.

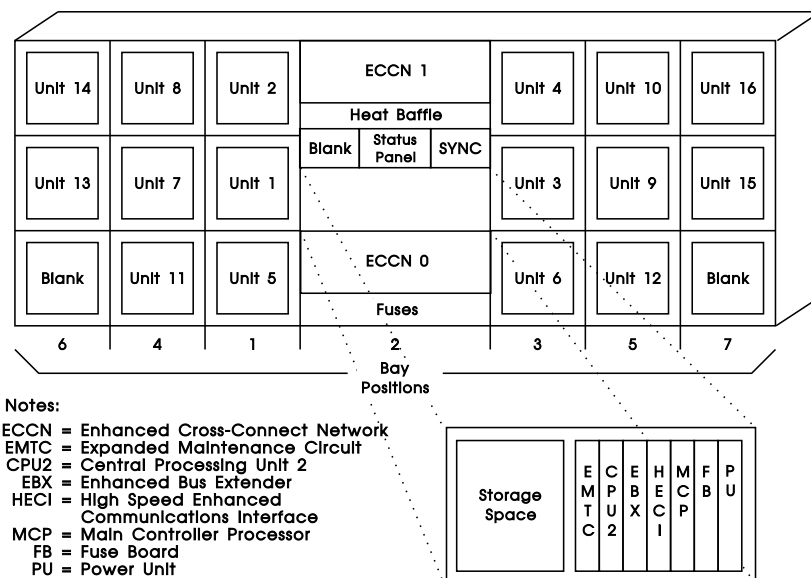


Figure 1-3. Capacity Expansion Frame

Switch Bay

The switch bay contains the following units:

- Cross-Connect Network (CCN) 0 and 1
- Synchronizer and Main Controller
- Status Panel
- Cross-Connect Network Power Unit
- Fuse and Alarm Panel.

The following paragraphs briefly describe each of these units.

Cross-Connect Network

The cross-connect network (CCN), Figure 1-4, is duplicated (sides 0 and 1) to protect against loss of service. Both sides must be equipped exactly alike. The CCN contains the following circuit packs: time slot interchange (TSI), cross-connect buffer (CCB), and cross-connect network interface (CCNI). The actual cross-connect function is performed in the TSI. Timing from the synchronizer and the control and status signals from the main controller are connected to the CCN through the CCNI.

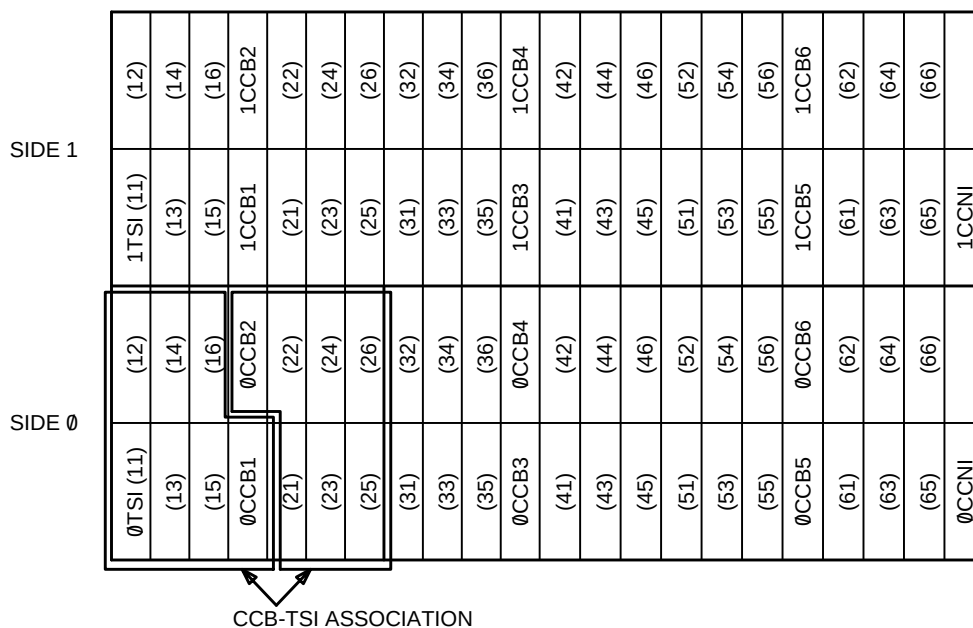


Figure 1-4. Locations of Cross-Connect Network Circuit Pack

Synchronizer and Main Controller

The synchronizer and main controller (Sync & MC) shelf, Figure 1-5, is mounted below the main controller. The sync circuit packs are located in the left of the shelf and the MC circuit packs are located in the right of the shelf as shown in Figure 1-5. The MC consists of the central processing unit 2 (CPU2), the communications interface (CI) which controls the communications between the internal and external links, the maintenance (MTC) circuit packs which control the interface between the MC and the alarm circuits and units, and the bus extender (BX). Power converters 411AA and MCP provide power for the MC. The sync contains duplicated circuits and is equipped to configure for the mode (master or slaved) and stratum of operation. Timing source signals coming to the sync for timing extraction connect through TLI (timing link interface) circuit packs. The redundant TLI (0 and 1) circuit packs provide the interface for up to four sources (8 TLI circuit packs). There are circuit pack slots for one redundant time base (TB). However, you may add two other redundant TB circuit pack pairs by using TLI3 (0 and 1) and TLI4 (0 and 1) slots. You can use the TLI slots because you will not need to interface to an external source if you use the internal TB source. The redundant synchronizer power units (SPU) provide power for the sync circuit packs. Timing from the TLI and TB circuit packs is connected to the CCN through digital phase-locked loop (DPLL) circuit packs.

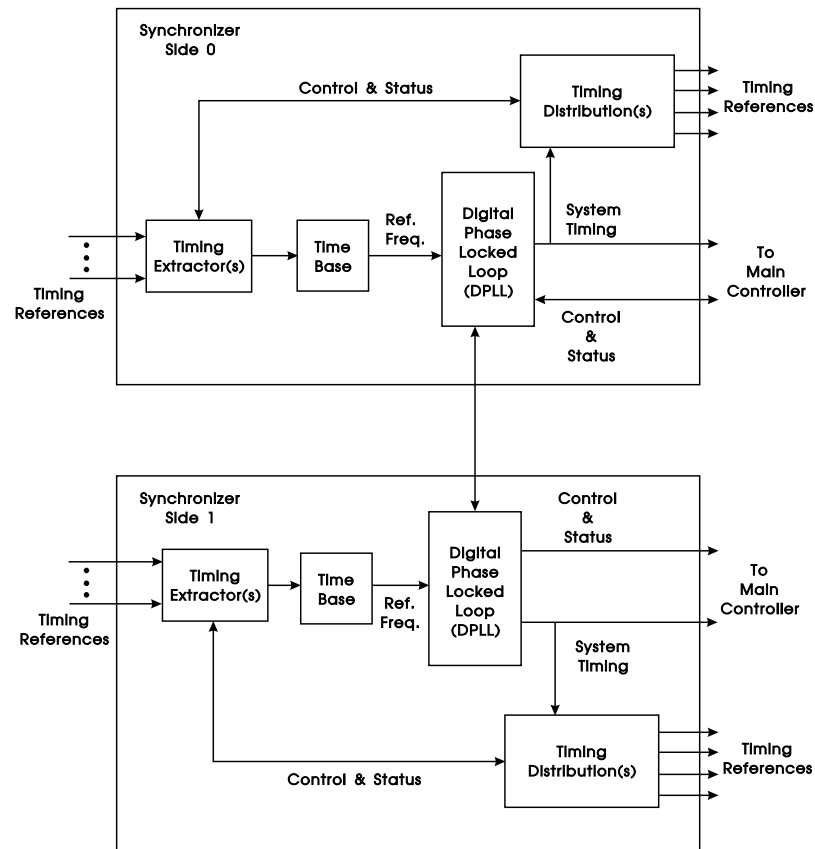


Figure 1-5. Original Switch Bay Synchronizer Circuit Pack Locations

Status Panel

The status panel contains alarm indicators (CRITICAL, MAJOR, and MINOR) which light when there is a failure in the DACS II or one of the facilities that connects to the DACS II. The ACO Button and ACO LED, main controller FAILURE indicator, RESET ENABLE switch, and RESET button are also mounted on the alarm panel. A plug on the front of the panel is used to connect a portable TTY to link 1. This plug is in parallel with a plug on the rear of the bay.

Cross-Connect Network Power Unit

The cross-connect network power unit (Figure 1-6) has eight +5volt power converters. Four provide the power for CCN0 and the other four provide the power for CCN1. Four fuse panel circuit packs provide protection for the power converter outputs to the CCNs.

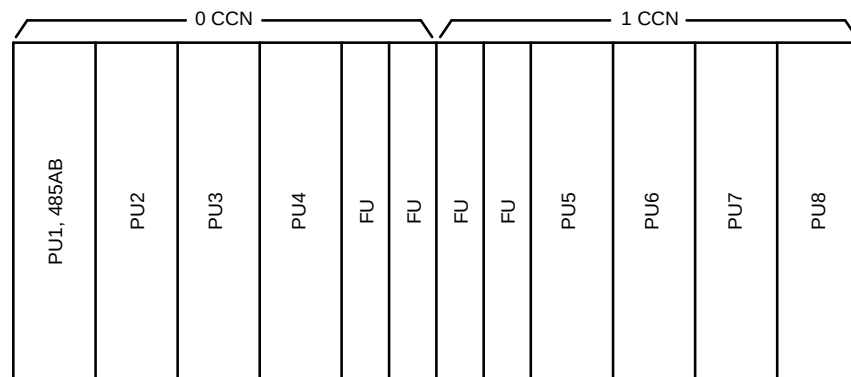


Figure 1-6. Original Switch Bay Cross-Connect Network Power Unit Circuit Pack Locations

Fuse and Alarm Panel

The 48-volt power is distributed to the switch bay units through the fuse and alarm panel, as shown in Figure 1-7. The 48-volt power is distributed through indicator fuses.

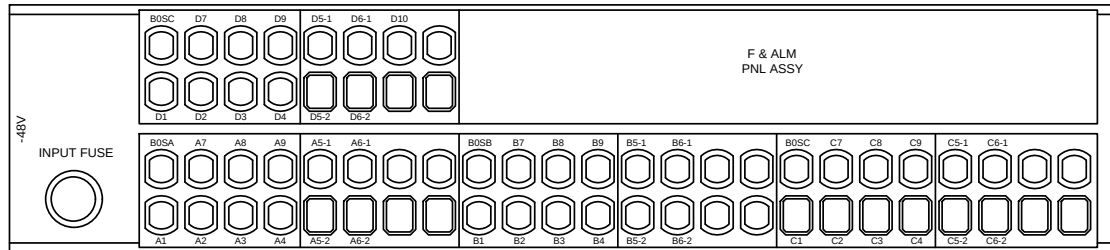


Figure 1-7. Original Switch Bay Fuse and Alarm Panel

CEF Switch Bay

The CEF switch bay, Figure 1-3, contains the following units:

- Extended Cross-Connect Network (ECCN)
- Extended Frame Controller
- Status Panel
- Synchronizer
- Main Controller (MC)
- Fuse and Alarm Panel

The following paragraphs briefly describe each of the units.

Extended Cross-Connect Network

The extended cross-connect network (ECCN), Figure 1-8, contains the expanded time slot interface (ETSI), clock control interface (CCI), and bus terminator (BT) circuit packs. The cross-connect function is performed in the ETSI. There are two ETSI (0 and 1) circuit packs provided for each unit (IFTU or DSPU). The CCI is the interface between the ECCN and synchronizer and main controller.

Extended Frame Controller

The extended frame controller (EFC) contains the status panel, synchronizer, and main controller. These units, which are mounted in a 2-shelf assembly, perform the same function as the comparable units in the original switch bay. Table 1-3 lists the codes for the main controller circuit packs that were updated in the CEF switch bay.

Synchronizer

The synchronizer, Figure 1-9, contains duplicated circuits for protection against failure. It is equipped to configure for the mode (master or slaved) and stratum of operation. Timing source signals supplied to the synchronizer for timing extraction connect through timing link interface (TLI) circuit packs. The redundant TLI (0 and 1) circuit packs provide for up to four sources. There are circuit pack slots for one redundant time base (TB). However, you may add two other redundant TB circuit pack pairs by using TLI3 (0 and 1) and TLI4 (0 and 1) slots. You can use the TLI slots because you do not need to interface the external source if you use the internal TB source. The redundant synchronizer power unit (SPU) provides power for the synchronizer circuit packs. The TLI and TB circuit packs are connected to the ECCN through the digital phase-locked loop (DPLL) circuit pack. The same synchronizer circuit packs are used in the original switch bay.

BT 1	ETSI 01	ETSI 02	ETSI 05	ETSI 07	ETSI 08	ETSI 11	ETSI 13	ETSI 14	CCI	ETSI 16	ETSI 15	ETSI 12	ETSI 10	ETSI 09	ETSI 06	ETSI 04	ETSI 03	BT 2

Figure 1-8. Location of Circuit Packs on ECCN Shelf

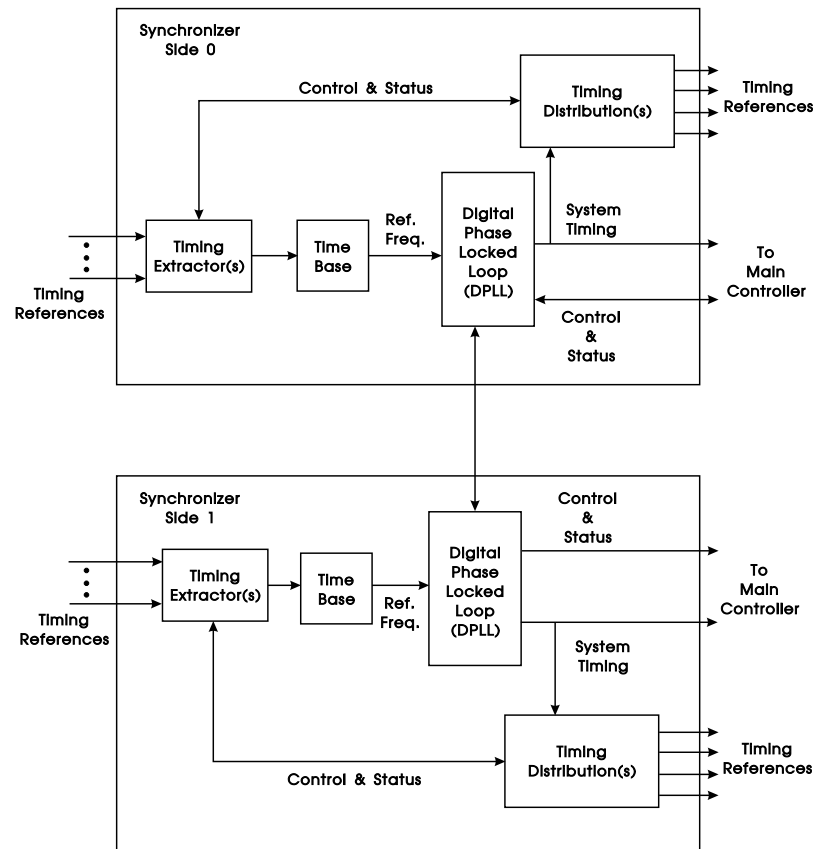


Figure 1-9. CEF Switch Bay Synchronizer Circuit Pack Locations

Table 1-3. Expanded MC Equipment

Circuit Pack	Equipment
CPU2	TM778
8-Mbyte EBX (Expanded Bus Extender)	UM71
EMTC (Expanded MTC)	UM75
8-Mbyte CI	TM658C
8-Mbyte ECI	TM736C
8-Mbyte HECI	TM762

Main Controller

The main controller contains the following units:

- Extended Maintenance (EMTC)
- Central Processor Unit 2 (CPU2)
- Extended Bus Extender (EBX)
- Communications Interface (HECI)
- Main Controller Power (MCP)
- Fuse Board (FB)
- Power converters

The EMTC controls the interface between the MC and the alarm circuits and units. The HECI manages the communications between the internal and external links. The EBX manages the communication between the MC and the ECCN. Two power converters and the MCP provide power for the MC.

Status Panel

The status panel, Figure 1-10, contains the frame alarm (CRITICAL, MAJOR, and MINOR) indicators, the ACO (alarm cutoff) switch and indicator, and the main controller FAILURE indicator, RESET ENABLE switch, and RESET indicator. A plug on the front of this unit can be used to connect a portable TTY to Link 1.

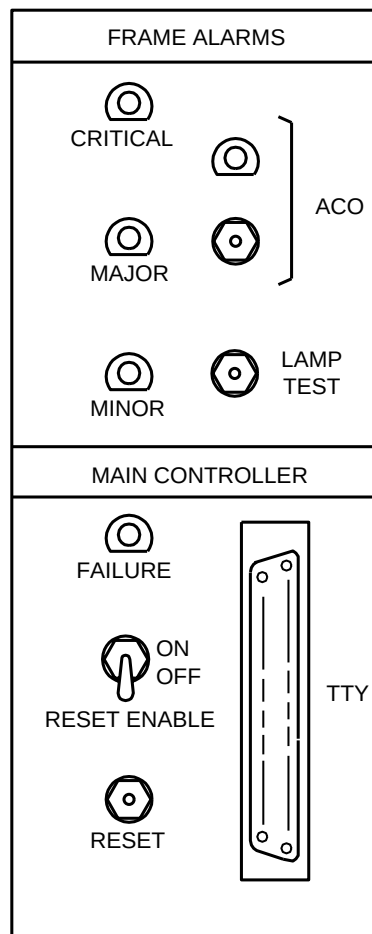


Figure 1-10. CEF Switch Bay Status Panel

Fuse and Alarm Panel

The 48-volt input power is distributed through indicator fuses in this panel, Figure 1-11, to the other assemblies in the CEF switch bay.

Interface Bays

As described previously, there are two types of interface bays — the original interface bay and the flexible interface bay.

In the original interface bays, unit positions 1, 2, 3, and 4 were always facility terminating units (FTUs) and Unit positions 5 and 6 were always DSPUs.

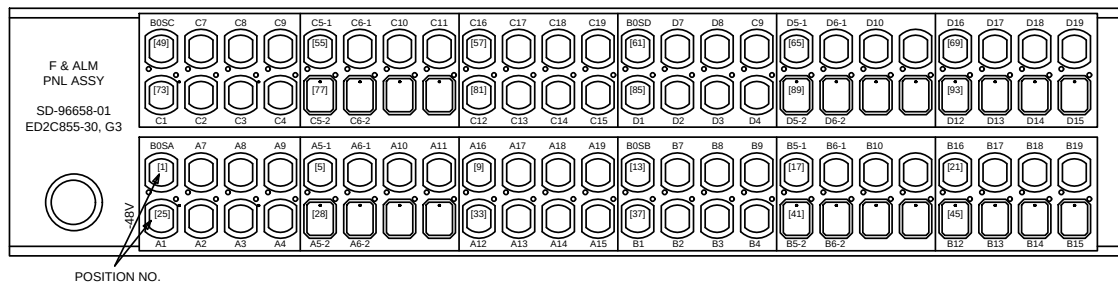


Figure 1-11. CEF Switch Bay Fuse and Alarm Panel

Power and Control Unit

The power and control unit is mounted in the original interface bays that use FTUs. The power and control unit contains power converters, fuse board circuit packs, central processing unit (CPU) circuit packs, and unit bus extender (UBX) circuit packs (see Figure 1-12). There is a power and control unit equipped for each equipped FTU.

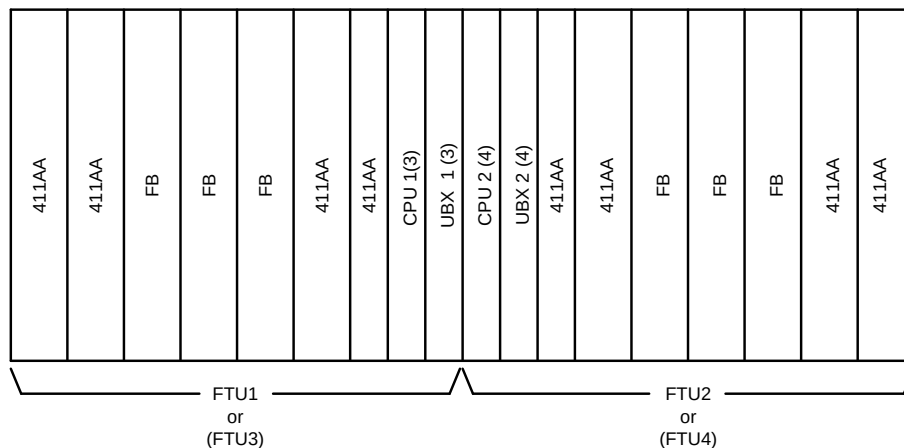


Figure 1-12. Original Interface Bay Power and Control Unit Circuit Pack Locations

Facility Terminating Unit and Integrated Facility Terminating Unit

The facility terminating unit (FTU) is the general name for the circuit block used to terminate digital line facilities; it is also the name for the facility hardware for the original interface bay. Within an FTU, the equipment is further divided into four FTMs (see Figures 1-13, 1-14 and 1-15). Each FTM occupies one shelf and contains one facility terminating module interface (FTMI), an format converter (FC) for each duplicated side, and up to 16 dual digroup circuit packs of the family of various network processing circuit (NPC) applications. Each dual circuit pack contains the circuitry for two NPC positions. When equipped for 2.048-Mb/s service, each FTM has up to 16 dual primary block circuit packs installed. And each NPC processes up to 30 DS0 channels. The common control circuit packs for the original FTU were mounted on the power and control unit described in the previous paragraph. These units are mounted on the FTM in the integrated facility terminating unit (IFTU). (See Figure 1-14.)

Digital Signal Processing Unit

The digital signal processing unit (DSPU), Figure 1-16, occupies one DACS II shelf and is equipped as needed by the customer to provide digital channel

processing functions such as channel bridging. This processing is done on internal channels; no facilities terminate on the DSPUs. Each DSPU consists of the common circuit packs, which are the digital signal processor interface (DSPI) and the unit controller, the specialized DSP circuit packs, and the power units for the DSPU. There are 8 DSP positions on the 0-side and 8 on the 1-side of the DSPU giving a total of 16 DSP positions. The DSP packs are duplicated on these two sides for redundancy to allow service switching in case a pack fails. The specialized DSP packs for the DSPU are: digital multipoint bridge (DMB) packs and C-bit processor (CPR) packs for export applications.

HDS3 Unit

The HDS3U, Figure 1-17, completely resembles the DS3U and operates similarly with some additional functionality. The HDS3U is used to terminate Hybrid DS3 facilities. The Hybrid DS3 signal contains seven DS2 signals, each DS2 signal containing either all 1544 Mbit/s signals or all 2048 Mbit/s signals. However, a single DS2 signal cannot carry a mixture of 1544 Mbit/s and 2048 Mbit/s signals. The MXR and FMT circuit packs have been upgraded (HMXR and HFMT, respectively) to handle Hybrid DS3 signal cross-connection. The HDS3U does not support the MIU circuit pack, used along with the MXR circuit pack to create a DS3U MMFG. The Hybrid MMFG consists of the HMXR circuit pack only; the slots which previously contained MIUs for the DS3U remain empty. The Hybrid DS3U UC has been redesigned to allow a capacity of 4 Mb of memory, instead of the DS3U's 2 Mb of memory, to support the additional software needed for this feature.

FTM 4	NPC (121-140)	0 F C (4)	F T M I (4)	1 F C (4)	NPC (141-160)
FTM 3	NPC (081-100)	0 F C (3)	F T M I (3)	1 F C (3)	NPC (101-120)
FTM 2	NPC (041-060)	0 F C (2)	F T M I (2)	1 F C (2)	NPC (061-080)
FTM 1	NPC (001-020)	0 F C (1)	F T M I (1)	1 F C (1)	NPC (021-040)

Figure 1-13. FTU Circuit Pack Positions

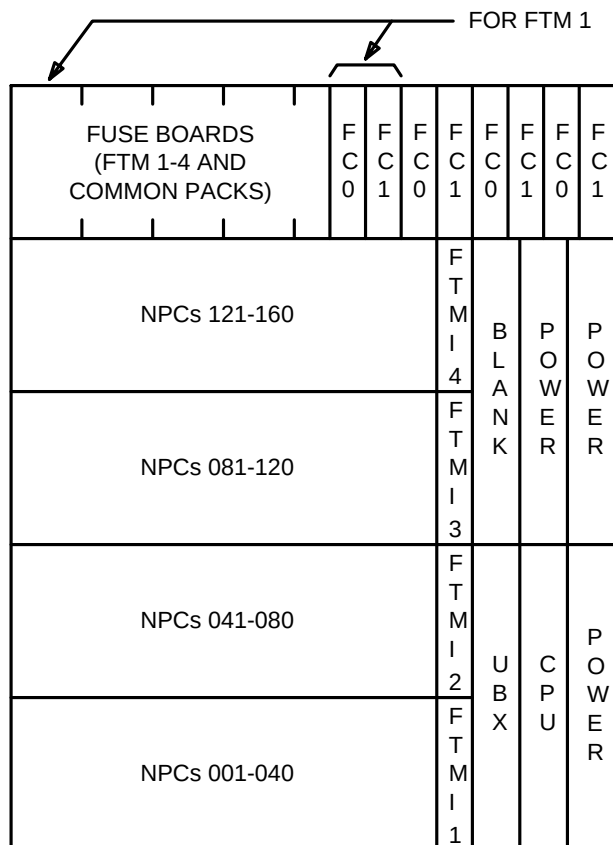


Figure 1-14. IFTU Circuit Pack Locations (Unit 1 Extended NPC Numbering Shown)

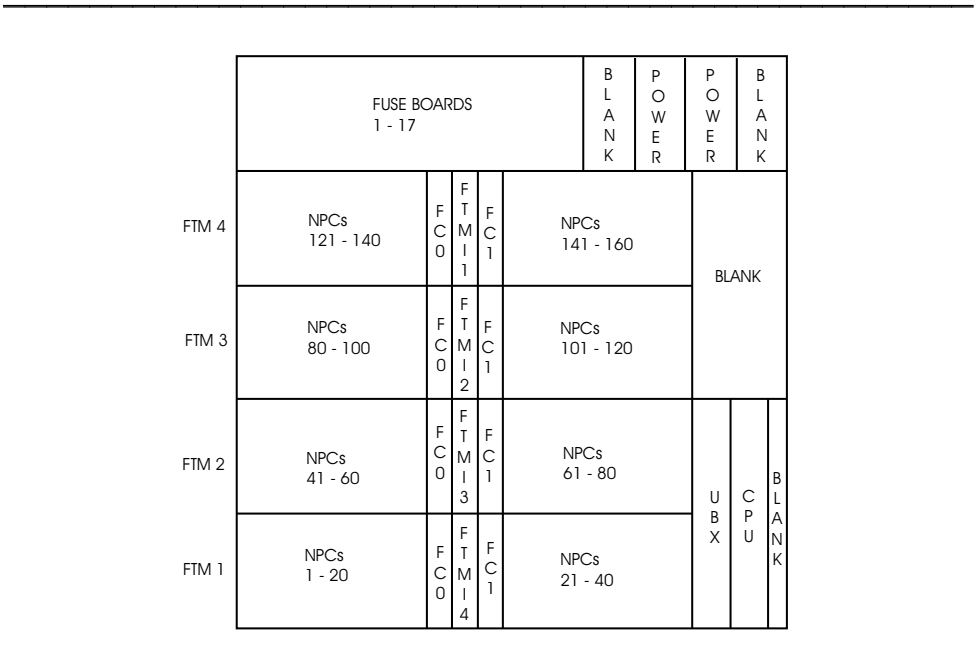


Figure 1-15. IFTU2 Circuit Pack Locations

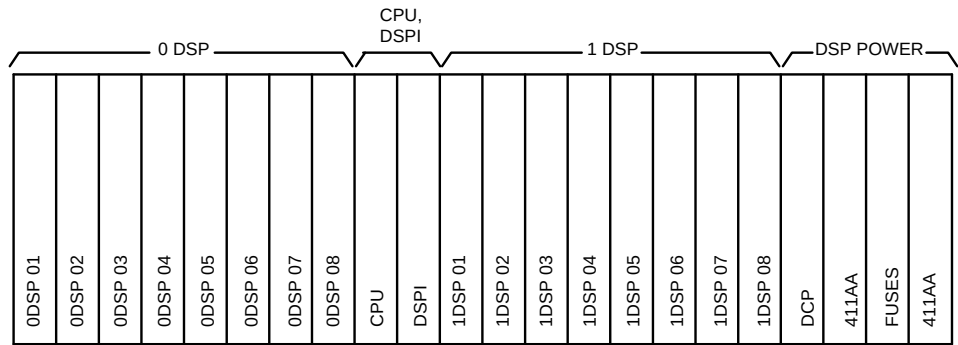


Figure 1-16. DSPU Circuit Pack Locations

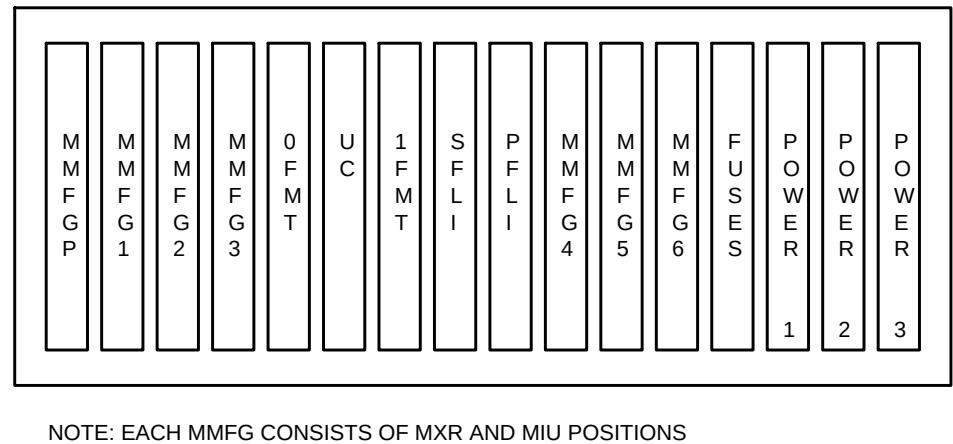
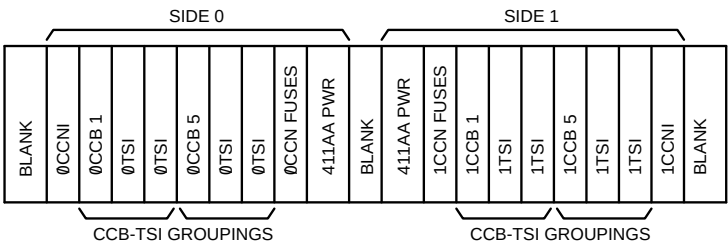


Figure 1-17. HDS3U Circuit Pack Positions

Single Bay

The single bay, Figure 1-2, combines one FTU, one optional DSPU, power converters, control and synchronization circuitry, a cross-connect network. It has a special cross-connect network, Figure 1-18, which is slimmed down to serve only two units of NPC. The cross-connect network is designated CCN2. An operational peculiarity of the single-bay frame is that the numbering of the unit positions in it is units 1 and 5 to match the designations in the original interface bay. The status panel, MC and Sync Unit, Figure 1-5; the FTU, Figure, 1-13; DSPU, Figure 1-16; and power and control unit, Figure 1-12, are the same as comparable units in the original switch and interface bays. The single-bay fuse and alarm panel is shown in Figure 1-19.



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Figure 1-18. Single-Bay Cross-Connect Network 2 (CCN2) Circuit Pack Locations

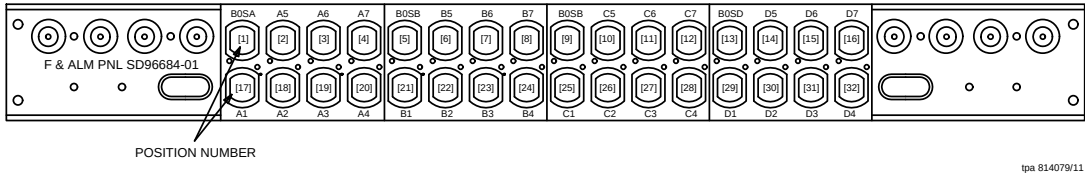


Figure 1-19. Single Bay Fuse and Alarm Panel

Functional Description

The following paragraphs are a functional description of the DACS II and are intended to provide the reader with a general knowledge of the circuit pack functions and interworkings.

Common Equipment Circuit Blocks

The basic function of DACS II is to provide access to incoming digital signal bit streams to interchange and interconnect (cross-connect) DS0 channels. This is done electronically within the circuitry without making any digital-to-analog conversions. Access to the channels for testing is also done by cross-connections.

The major circuit blocks of the DACS II are synchronization circuits that produce precise timing waveforms needed to maintain time slot alignment, the cross-connect network to accomplish the time slot connections, and microprocessors to manage internal and external operations. Since multiplexing the signal time slots to form higher capacity bit streams is inherent in the cross-connect process, circuit redundancy is needed to protect against the loss of service should a failure occur in a high-channel-capacity pack. Accordingly, all circuit packs carrying more than 120 DS0 channels are duplicated. Similarly, because of their importance, the synchronizers and power supplies are duplicated. The synchronizers also have the capability of temporarily operating in a stable, free-running mode. Nonvolatile memory is provided to protect against the loss of circuit memory if there is a power failure. Interface circuit packs are provided for communications within the DACS II, with administrative links to external systems, and with the office frame alarms system.

To support the increased capacity of the DACS II capacity expansion frame (CEF), expanded versions of two of these circuit blocks are needed. The two expanded circuit blocks include the expanded frame controller (EFC) and the expanded CCN (ECCN); the sync remains unchanged.

The DACS II circuit blocks are illustrated in the system architecture block diagram in Figure 1-20 which shows the CEF. At the center of this diagram is the main controller with its connections to the other controllers and circuitry in the frame. The units of facility terminating and digital signal processing circuit packs and the duplex cross-connect network (CCN), all of which carry the customer service, are shown across the top of the figure. Figure 1-20 shows the use of any type unit in the unit positions that require the fully flexible feature.

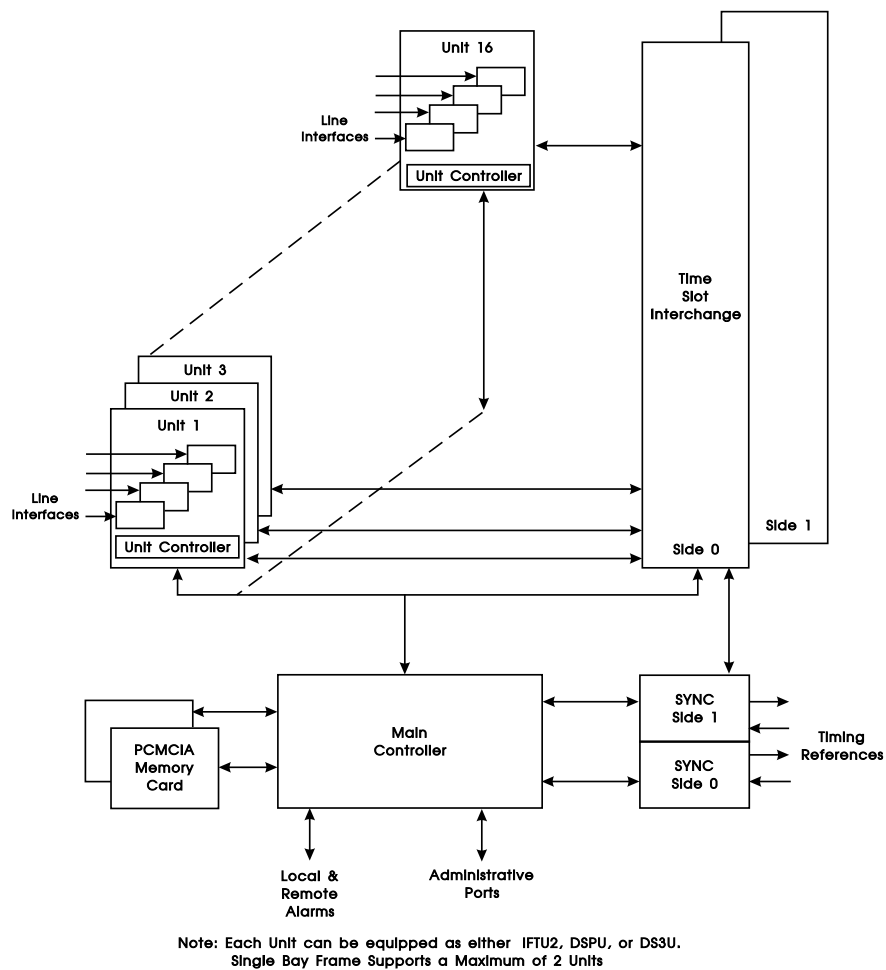


Figure 1-20. System Architecture Diagram

Communication between the unit controller (UC) for each unit and the maintenance circuit (MTC) of the main controller is by means of a local area network (LAN). Communication between the CCN or ECCN and the main controller is by means of a control bus. Connection of the syncs, nonvolatile memory devices, and the alarms and administrative ports to the main controller is as follows: the syncs and the PCMCIA Memory Cards connect to the main processor, the local terminal and outside links connect to the high-speed enhanced communications interface (HECI), and the alarm connections go to the maintenance pack. These major blocks are the topics of discussion in the following paragraphs.

Main and Secondary Controllers

The heart of the DACS II microprocessor control system is the main controller (MC). The MC maintains the DACS II operating system, processes input commands and internal interrupt operations, and detects and responds to internal errors and alarms. It communicates with the other controllers to execute the time slot cross-connections, and it monitors the health of the frame. One result of this monitoring is the selection of one duplicated sync to supply timing to the frame and the selection of the associated CCN to carry service. Other results are initiating recovery routines if an error is detected and reporting alarms if a failure has occurred.

The MC consists of the following circuit packs:

- central processing unit 2 (CPU2)
- high-speed enhanced communications interface (HECI)
- maintenance circuit pack (MTC or EMTC)
- bus extender (BX or EBX).

The CPU2 contains the microprocessor circuitry and the associated circuit memory along with the primary and secondary memory cards. The HECI is the interface between DACS II and external administrative ports as well as a local terminal. The EMTC or MTC pack is the hub for the LAN and serves mainly as the alarm control point. The BX or EBX provides the dual bus control interface to the duplicated cross-connect network.

The unit controllers, which are the secondary controllers, manage the service provisioning information in the local unit memories. They also process commands from the main controller and send replies or requested information through the unit bus extender (UBX) to the main controller.

In the IFTU2, the facility terminating module interface (FTMI) provides communication between the UC and the network processing circuits in the modules of the unit. In digital signal processing units, the digital signal processing interface (DSPI) serves as the interface between the processing circuit and its UC. For the CEF frame, the clock and control interface (CCI) contains the main controller interface circuitry. HECI is the interface between

DACS II and external administrative ports.

Nonvolatile Memories

The MC maintains redundant copies of the system software and database on non-volatile memory. This storage space is provided via two removable circuit pack PCMCIA Memory Cards (PCMCIA is an acronym for Personal Computer Memory Card International Association). The system maintains fully duplicated memory and software backups on both Memory Cards. The two Memory Cards supported are referred to as primary memory (PMEM) secondary memory (SMEM). To ensure database synchronization between working and backup memories, both Memory Cards are automatically updated when a backup is done from RAM to memory.

NOTE:

If PMEM is removed from service, the MC goes into MCOND, and the database is never booted from SMEM.

The Memory Cards are also used to download new software releases into the DACS II. This is accomplished by simply installing a Memory Card containing the new software and then executing the DACS II software upgrade procedure. The software upgrade procedure is non-service affecting.

Internal Synchronization

Figure 1-21 is a block diagram of the DACS II synchronizer. The synchronizer has duplicated sides (sync 0 and sync 1). Each sync contains the following circuit packs: up to four timing link interfaces (TLI), one or two time bases (TB), and one digital phase-locked loop (DPLL). The TLIs are used as timing extractors or timing distributors. The synchronizers operate in either the slaved or master timing mode. In the slaved mode, the TLIs are used as both timing extractors and timing distributors. In the master timing mode, they are used as timing distributors only. The TB is a source of stable timing for the DPLL. The DPLL is the source of the DACS II timing signals. Control of the DACS II synchronizer is accomplished through a pair of 2-way communications links to the main processor (MP). Syncs 0 and 1 are cross coupled so they run at the same frequency and phase during normal operation.

During normal operation, both sides are energized but only one side is in service (active). If the active side fails, service is automatically switched to the other sync. If both syncs fail, the synchronizer enters the "holdover" state. In the holdover state, the synchronizer retains the last good frequency. And the stability of the synchronizer is dependent on the stability of the output of the TB circuit pack. There are TB circuit packs that can match the following references:

- 2.048-Mb/s Interface Toll

- 2.048-Mb/s Interface Local.

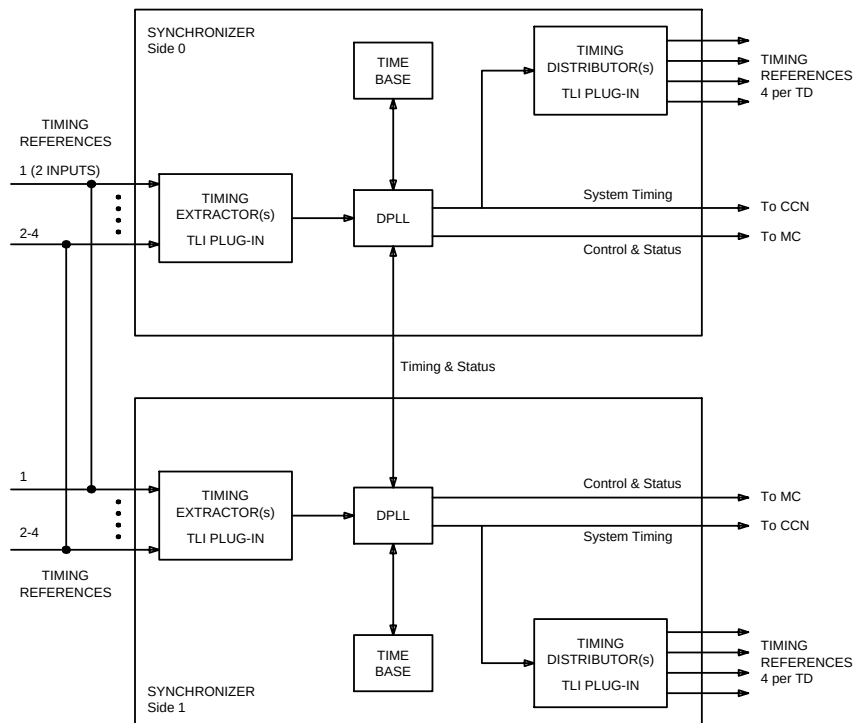
In the slave timing mode, the timing extractor develops a timing reference from an incoming timing link signal. The timing extractor reference output in conjunction with the stable timing signal from the TB adjusts the output of the DPLL to match the incoming link signal. Each timing extractor can accept two incoming timing link signals. Each incoming timing link signal is applied to the same timing extractor input terminal in syncs 0 and 1. You can use up to four TLIs as timing extractors. Therefore, there is a possibility of connecting up to eight incoming timing link signals to the synchronizer. Only one of the inputs controls the synchronizer output. The signals are prioritized so that if a signal of higher priority fails, the synchronizer switches to the signal of next highest priority. Sync timing can be extracted from 2.048 Mb/s line signals. Eight NPC positions in units 1 and 2 (four NPCs per unit) can be used for the source signals. When used as timing sources, the NPCs are identified in the commands to grow the TLI ports.

Different codes of TLIs are used as timing extractors depending on the nature of the incoming links. The timing extractor selected depends on the line rate and signal format of the incoming line signal of the external clock. The available timing extractors include circuit packs to accommodate the following incoming timing links:

- 2.048-MHz basic synchronization reference frequency (BSRF)
- CCITT CEPT 2.048-Mb/s transmission lines
- CCITT 2.048-Mb/s transmission lines
- Sinusoidal/square waves of various frequencies

In the slave timing mode, each TLI slot that is not used as a timing extractor can be used as a TD. The TD output signals are derived from the DPLL output. The TD distributes timing signals to equipment outside the DACS II.

In the master timing mode, the DACS II is a timing island providing its own timing and timing for external equipment as required. In the master timing mode, a third TB is installed in sync 1 TLI slot 3. The third TB provides additional redundancy for reliability and maintenance purposes. In the master mode the TDs distribute timing signals to external equipment the same as they do in the slave mode.

**Figure 1-21. Synchronizer Block Diagram**

2.048 Mb/s Facility Terminating Units

The IFTU2 is the peripheral unit type that is grown and equipped to terminate 2.048 Mb/s lines. Common equipment in the FTU provide the control functions and signal processing for connection to the CCN or ECCN. The network processing circuits (NPCs) provide the line interface and signal processing. The family of NPC codes, each with its own array of software selectable line options, provides all the required line formats and zero code suppression modes for compatibility with other transmission equipment at the other end. The functions of the circuit packs in an FTU are described in the following paragraphs. A fully equipped FTU consists of four facility terminating modules (FTMs). Figure 1-22 shows the signal rates and conversions that take place in the FTM.

Communication and control circuitry for the FTU is contained in the unit controller (UC), the unit bus extender (UBX), and the FTM interface (FTMI). The UC connects to the DACS II main controller over the LANs. Within the FTU, the FTMI serves as the interface between the UC and the packs in the FTM, distributing information from the UC and sending replies from the FTM packs. Distributing information from the UC involves decoding the address data for the appropriate FTM. The UBX is needed with the UC to isolate and reclock the communications with the FTMI.

Timing and sync pulses from the synchronizer are delivered to the format converter (FC) packs in the FTM from the cross-connect buffer (CCB) or clock and control interface (CCI) packs of the cross-connect network. The FTMI is also timed from the FC packs.

a single bit stream that is twice the rate of each input. The multiplexer also produces a duplicate output signal for protection if one output (side) fails. These outputs are applied along with the same outputs from the other DPCs in the module to the respective format converters (FCs) of the module. In the FC for each side, these signals are converted from serial to parallel data forms and read out on multiple leads to the respective CCN. The FC for a side goes to the like side of the duplicated CCN, and these same conversions and connections occur for the other (up to three) FTMs in the unit.

When the FTMI is grown in the software data base, the line interface equalizer is specified for the FTM shelf. for 2.048 Mb/s lines, the equalization for the left and right halves of the FTM shelf is specified; this equalization is applied to the outgoing (transmit side) path going to the DSX-1 bay.

Cross-Connect Networks

The overall function of the cross-connect network is to accomplish channel cross-connections by the time slot interchanging operations in the time slot interchange (TSI) packs. These packs are called expanded TSIs (ETSIs) in the ECCN for CEF frames. The TSI or ETSI operations are: connecting unit channel data to network buses, switching time slots out of the network data buses to the unit buses, and connecting the cross-connected data to the unit port. Each TSI or ETSI has access to the network data from all the peripheral units. The switching of time slots into the unit buses is enabled by buffers in the TSIs that store the data so that it can be written into the unit buses in the correct channel sequence. Each facility or digital processing unit connects to the CCN or ECCN over four network buses or ports. These ports have a 4096 time-slot capacity. Each port contains 1024 time-slot data buses, timing, status and error information.

Interconnection of information in the internal bit stream establishes a path through the DACS II that may be a 1- or 2-way cross-connection, a broadcast connection, or connections to the DSPUs for conference bridging. The type of connection is controlled by the input command. This path (or map) is determined by the main controller based on the record of used and available paths in the controller memory. The maps are autonomously transferred to the memory cards for backup protection. The CCN and ECCN are single-stage, nonblocking, time division switches.

The CCN or ECCN is duplicated so that cross-connections can be reproduced in the other network by the main controller without any loss of service should a failure occur on the active side. If the main controller is also out of service when a failure occurs in the CCN, ECCN, or duplicated peripheral unit pack, other packs in the unit will cause the switchover to the other side of the cross-connect network. The switchover can also be manually forced to allow maintenance on the inactive side.

Three CCNs are available for the different size DACS II frames: the CCN for the original multibay frames (with up to six units), the CCN for the single-bay frame (with two units), and the expanded CCN (ECCN) for the capacity expansion frame (with up to 16 units). These versions of the CCN are described in the following paragraphs.

CCNs for Non-CEF Frames

When fully equipped, the CCN for the original multibay frame is a 24,576 X 24,576 time-slot switch because it handles 6 times the 4096 time slots (per unit). Each side of the CCN mounts up to 36 TSIs, one CCNI, and one CCB for each peripheral unit. In a fully equipped frame, six TSIs are required per unit to interconnect each unit with itself and the five other units. The CCN interface (CCNI) communicates between the CCN and the MC and contains the error summary register for the CCN. The CCB produces the timing and sync pulses from the synchronizer circuit block. The TSI switches time slots from the network data buses from all the peripheral units to the CCB for conversion to the port going to the associated unit. Power for the duplicated network is obtained from power units in a separate shelf.

The CCN for the single-bay frame is a scaled down version of the above; it is an 8,192 X 8,192 time-slot switch because it serves up to two units. This network is distinguished in the software as the CCN2. Fully equipped, it contains four TSIs per side, one CCNI per side, and two CCBs per side. Power is obtained from power units in a separate shelf.

The ECCN for the CEF is a 65,536 X 65,536 time-slot switch because it handles 16 times the 4096 time slots (per unit). Each side of this duplicated network mounts one clock and control interface (CCI), one ETSI per unit (16 total), and two bus terminators (BT). The CCI regenerates sync clock and timing from the sync, communicates between the expanded MC and the ETSIs including master resets from the MC, and provides error detection for the ECCN. The ETSI converts the network data from the peripheral units to format required in the ECCN, connects time slots from the unit to the network receive data bus, switches time slots out of the network buses from all the ETSIs, and connects the time slots to the transmit data buses going to the associated unit. The BTs terminate both ends of the 16 network buses running between the ETSIs with a resistive termination. These packs also force desired states on these buses during inactive periods or when the CCI pack is disconnected. Figure 1-23 shows a simplified block diagram of the ECCN; this diagram is drawn with the BTs on the sides which nicely resembles the circuit pack mounting in the ECCN shelf.

The CCI contains the converter circuitry to produce 5-volt power for itself and the ETSIs on the same side of the network. Additional 3-volt power required by each ETSI is produced on the ETSI itself. There are no separate power units for the ECCN.

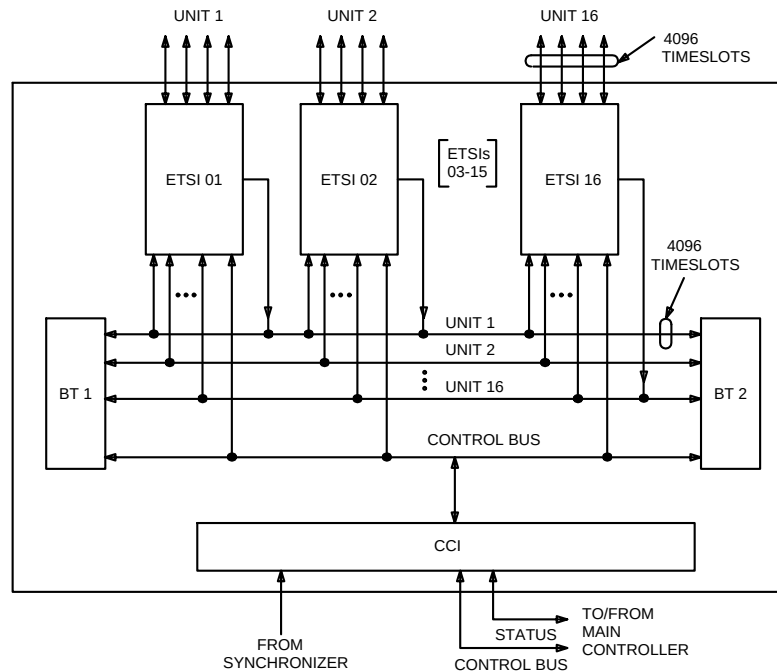


Figure 1-23. ECCN Block Diagram

Digital Signal Processing Units

These are equipped with the appropriate duplicated DSP circuit packs to produce further time slot interconnections and custom arrangements such as DS0 channel bridging. By being separate from the facility terminating units, the full time slot capacity of a unit is available at the DSPUs to allow almost any size or type connection without sacrificing any termination capacity in the facility units.

DS0 channel bridging is enabled by installing digital multipoint bridge (DMB) circuit packs in the DSPU. Each DMB consists of a single circuit pack that serves both the input and output functions. Channels to be bridged are cross-connected in the CCN, bridged in the DMB, and returned to the CCN to be added to the data stream. This bridging is done digitally without decoding the channel information. Each DMB contains two conferencing devices, with each conferencer supporting 256 channels. Thus, each DMB pack can support 12 channels or up to 170 separate 3-leg conferences. As additional DMB packs are added, additional conferences can be supported. Each DSPU can support up to eight duplicated DMB packs. Channel associated signaling bits are not transmitted across the DMB. The DMBs are duplicated for protection against service loss and connected to the respective sides of the CCN.

Among the bridge configurations that can be supported are the symmetrical, polling, and broadcast. The symmetrical configuration is a 2-way communications circuit between all bridge legs. The polling data network is a 2-way broadcast circuit where the broadcast direction is from the FTU NPCs through the CCN only. The return direction is summed and processed for gain, echo suppression, and noise guard through the DMBs in the DSPUs. The broadcast network is a 1-way circuit with only one return path to the backbone. Broadcast connections are actually formed outside the DMB in the CCN.

The CPR circuit pack is used to monitor or insert C-bit messages for circuits. Commands connect channels from facility terminating NPCs to the CPR pack and establish the director DACS II functions of monitoring and writing the channel C-bits. The DACS II frames in the circuit (liaison) are assigned director DACS II functions based on their locations on the circuit. The CPR pack is grown as type CB (for C-bit), and each CPR pack has the capacity for 128 connections from facility terminating NPCs.

Frame Alarm Indications

Extensive error detection and handling takes place in the DACS II. For example for a hardware error, the DACS II evaluates all the error inputs including any from power units and reports the results in an ERR ANALYSIS message. These processes and those that check for software errors are not detailed in this manual. General descriptions of the following are provided here:

- Circuit pack failures
- Carrier failure alarms
- Facility performance alarms.

Circuit Pack Failures

Circuit pack communication and operations are continuously monitored by the main controller to check for errors. If errors are detected, the main controller institutes an error recovery routine which confirms that the error was not a transient and runs diagnostic tests on the suspect pack. The suspect pack is also removed from service, and service is switched to the other side if the circuit group is duplicated. If the tests fail, an office alarm is registered. If the tests pass, the CP (circuit pack) must be manually restored to service. In the DS3 unit, all the transmission packs are included in protection switching groups. This switching to a standby spare prevents the loss of service due to the failure of a single pack.

Carrier Failure Alarms

These show a loss of incoming signal, framing, or high transmission errors or receipt of a remote alarm signal from the equipment at the other end of the line. Incoming failures are reported in an output message as a red alarm, and the receipt of the signal that indicates a local alarm at the other end is reported as a yellow alarm. Either condition also generates an office alarm. Whenever a red

alarm exists, DACS II sends a yellow alarm signal to the other end. Additional carrier failure alarm conditions that are reported in output messages are:

- Simultaneous red and yellow DS1 alarms
- AIS (alarm indication signal), also referred to as the all 1s signal
- Local and remote alarms from a digital multiplex interface frame (DMI/BOS signaling format).

The AIS (all 1s signal) is a digital signal associated with a maintenance alarm detected on a defective maintenance span. DACS II transmits the AIS signal in the direction of the failure as a substitute for the normal signal. It is intended to show other equipment (downstream) that a failure has occurred elsewhere and to inhibit local alarms so that the defective section can be identified by the local alarm indication.

The programmable AIS alarm allows the user to select how the alarm indication signal from the far end will be reported. The DACS II user can select whether a major alarm, minor alarm, or informational alarm (default) is generated.

During a carrier failure, the affected NPCs send trunk conditioning and trouble insertion words out on the channels. Trunk conditioning is used on channels with signaling to cause office switching equipment to discontinue calls and stop charges. Trouble insertion words are sent in the message part of the channel and are necessary to signal trouble on data circuits. The codes for these trunk conditioning or insertion words are entered as part of the cross-connect commands.

Facility Performance Alarms

Microprocessor circuits in the NPCs detect and record various line error conditions. The results of this monitoring are used to provide status information on demand and to register office alarms when prescribed thresholds are exceeded. The monitored parameters vary depending on the type of NPC, but the following list for DS1 lines serves as an example: (1) line bit errors, (2) errored seconds, (3) severely errored seconds, (4) cyclic redundancy check errors, and (5) carrier reframing activity. Current counts are available on demand by requesting the NPC status, and accumulated counts are obtained by requesting the count for a particular facility parameter or as provided in the daily (midnight) report.

The alarm thresholds for the facility parameters are set initially when the NPCs are provisioned for service. Unless specific alarm thresholds are entered, default values apply. Up to three additional values for each alarm can be loaded into the DACS II to serve as options that can be selected initially or by means of a change command.

Status Panel Functions

The status panel conveys status and alarm information regarding the DACS II and provides an administrative port (TTY1) for connection of a console terminal. This is a multiple of administrative link 1 and allows connection of a portable terminal while the regular terminal is disconnected from the back. The CEF status panel is mounted on a circuit pack.

There are five LED indicators on the status panel. The classification of the alarms and the color of the LEDs vary on panels used outside the U.S.A., but the following gives the domestic stampings:

- FRAME ALARM - CRITICAL: Indicates a service-affecting failure affecting more than 120 channels (red LED)
- FRAME ALARM - MAJOR: Indicates a service-affecting failure affecting equal to or less than 120 channels (red LED)
- FRAME ALARM - MINOR: Indicates a non-service-affecting failure (yellow LED)
- MAIN CONTROLLER - FAILURE: Indicates a failure of the main controller (red LED)
- FRAME ALARM - ACO (ALARM CUTOFF): Indicator that is lighted when the alarm cutoff switch is operated (green LED).

There are four switches on the status panel that do the following functions:

- FRAME ALARM - ACO: Disables the audible alarm
- FRAME ALARM - LAMP TEST: Checks for failed lamps by lighting all lamps on the status panel
- MAIN CONTROLLER - RESET ENABLE: Switch that enables (ON position) or disables (OFF position) the main controller reset switch
- MAIN CONTROLLER - RESET: Resets the main controller provided the RESET ENABLE switch is in the ON position.

Powering

Power distribution and fusing for the frame are done on the main fuse and alarm panel and on shelf fuse blocks. Office battery is delivered over four feeders so that the loss of any input will not interrupt service. These feeders are fused at the fuse and alarm panel with 70-type fuses that provide a visual indication when blown and automatically activate office alarms.

Power units in the frame produce lower DC voltages derived from the -48 volt input. Secondary feeders distribute power to groups of converters for the major circuit blocks in the frame (controllers, syncs, CCNs, DSPUs, and FTUs). Each side of the sync and CCN has its own converter group. Different codes of converters are used for the various output voltages needed in each group, but each one has common protection mechanisms. These mechanisms are: a power interlock, to turn the converter off whenever the latch is opened for removal; and power shutdown circuits, to prevent overvoltage or overcurrent damage. A red LED on each converter lights when a shutdown circuit operates, when the output fails, or when the latch switch is turned off. A power converter failure causes an office alarm. The 563A converters for the DS3 unit also have a green LED that lights to show that the power is on.

The power protection philosophy for circuit pack power units is based on the use of redundant power converters that supply the load in a converter group when a converter fails. This is done by monitoring circuits and extra wiring that keeps the converter groups in a power sharing mode until a failure is detected. The number of standby power units needed in a power group is determined by the load requirements. In the FTUs and in other groups where the circuit packs are added as service growth occurs, these requirements depend on the number of circuit packs installed.

For the ECCN of the CEF frame, the CCI pack for each side contains the power converter circuitry to produce 5-volt power for itself and the ETSIs on the same side of the ECCN. Additional 3-volt power required by each TSI is produced on the ETSI itself.

DS3 Hybrid Termination Feature

A Hybrid DS3U is very similar to the non-hybrid DS3U except that it is also able to demultiplex and multiplex E1 signals in addition to any DS1 signals that might be carried by the DS3 signal. The multiplexing standard for a DS3 signal is defined in Bellcore document TR-TSY-000009 entitled "Asynchronous Digital Multiplexes Requirements and Objectives". In that standard, it is shown that a DS3 signal carries seven DS2 signals, which have a transmission rate of 6.312 Megabits/second. Each DS2 signal may carry four DS1 signals of 1.544 Megabits/second rate. Therefore a DS3 signal may carry 28 DS1 signals.

A DS2 signal may also carry three E1 signals of rate 2.048 Megabits/second. This is described in the ITU-T standard G-747. If each DS2 within a DS3 signal carries E1 signals, then a total of 21 E1 signals may be carried within a DS3. A DS3 signal may carry both DS1 and E1 signals within its multiplex; however, the embedded DS2 signals carry either four DS1 signals or three E1 signals, but not both.

Each Hybrid DS3U terminates up to six DS3 coaxial lines and contains the equipment to demultiplex the DS3 asynchronous signals into component DS1 and/or E1 signals. In turn the DS1 and E1 signals are demultiplexed into their component DS0 channels for connection to the existing CCN for cross-

connection. DS0 channels from other facilities connected to the CCN are assembled into DS3 signals for connection to the DS3 lines in the other direction. Once derived, the DS0 channels can be cross-connected to other DS0 channels, to the DSPU, or to test access equipment for transmission and signaling tests.

Since one DS3 signal contains 28 DS1 signals, 21 E1 signals, or a combination thereof, protection switching is provided in the Hybrid DS3U to prevent the loss of service owing to the failure of any single circuit pack in the HDS3U. This switching is for a failure of any Multiplexer - Multiplexer Interface Unit pair.

The following subsections provide the functional description of the HDS3U circuitry and the HDS3U protection switching.

Transmission Paths

As for the non-hybrid DS3U, Figure 1-24 shows a simplified block diagram of the DS3U equipment. The facility line interface (FLI) pack forms the interface with the DS3 coaxial lines on the facility side of the unit, and the Hybrid formatter (HFMT, the Figure shows only an FMT) forms the interface with the CCN on the DACS II side. At the heart of the MXR - MIU functional group (MMFG) is the Hybrid-multiplexer (HMXR, again the Figure shows only an MXR) which contains the muldem (multiplexer-demultiplexers) to make the signal conversions between the DS1/E1 and DS3 (M13 muldem) and between the DS1/E1 and DS0 (M10 muldem). (The Multiplexer Interface Unit (MIU) is not supported within the Hybrid DS3U at this time. However, the MMFG notation has been retained for consistency.) The functions of these packs are detailed in the following subheadings for those packs.

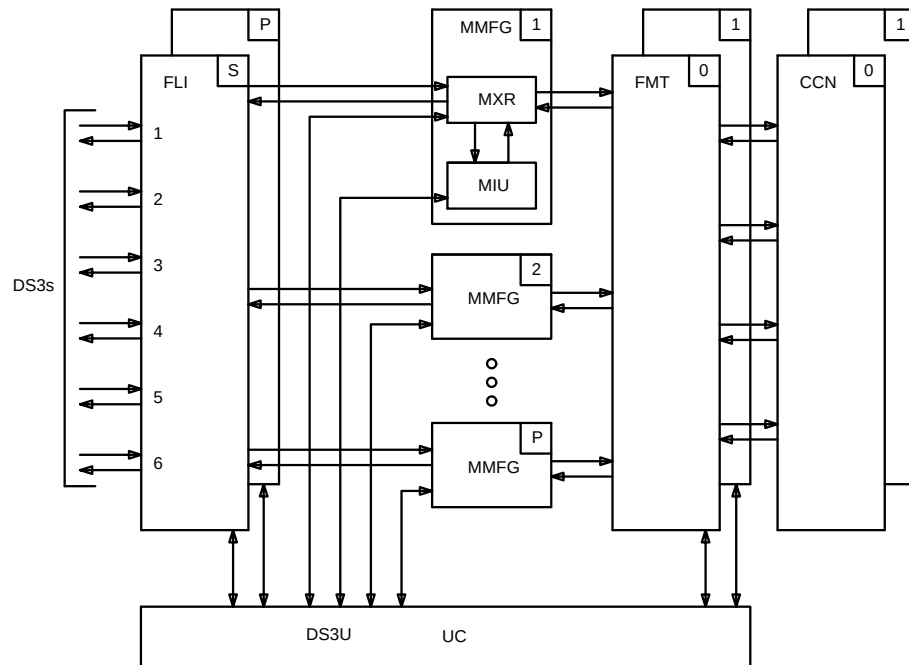


Figure 1-24. Simplified DS3U Block Diagram

FLI Pack. This pack terminates up to six DS3 coaxial lines for connection to the HMXR positions in the HDS3U. In addition to the signal termination that involves both impedance matching and signal level equalization, the FLI also: (1) performs bipolar/unipolar signal conversions, (2) recovers DS3 line clock signal for HMXR demultiplexing functions, and (3) accomplishes DS3 signal loopback on an out-of-service HMXR when the pack is diagnosed. Two FLI packs are provided in the HDS3U for protection switching. The line signals pass through relay contacts for the service and protection FLI packs in the unit so that the DS3 signals can be connected around the service FLI to the protection FLI if the service pack fails. The FLIs (working with the HFMT packs) also accomplish the HMXR protection switching on the line side of the MMFG packs. If any of the six MMFGs fails, the FLIs and HFMTs simultaneously switch DS3 data to the protection MMFG. Further details on the operation of the protection groups in the HDS3U are covered under a separate heading. Circuitry in the two FLIs maintains 75-ohm line impedance whether one or both of the unit FLIs are present.

HMXR Pack. Figure 1-25 shows an expanded block diagram of the data flow through the M13 and M10 muldems in the MXR pack. The HMXR has an identical structure except that there are 21 E1 PCM transceivers in addition to the 28 DS1 PCM transceivers. At the FLI interface on the pack, the HMXR selects either the service or protection FLI to accomplish protection switching of

the FLI on the DACS II side. In the direction of transmission toward the CCN, the M13 muldem demultiplexes the DS3 signal into 28 DS1s, 21 E1s, or a combination thereof. The possible 28 DS1 signals are applied to the 28 DS1 PCM transceivers in the M10 muldem. The possible 21 E1 signals are applied to the 21 E1 PCM transceivers in the M10 muldem. Each DS1 transceiver reformats the 24-channel data and signaling into a 32-channel 4.096-Mb/s serial signal that is combined with the signal from the other transceiver for the pair in the channel controller circuit. Each E1 transceiver reformats the 32-channel data and signaling into a 32-channel 4.096-Mb/s serial signal that is also combined with the signal from the other transceiver for the pair in the channel controller circuit. The channel controller multiplexes the two 4.096-Mb/s signals into a single 64-channel 8.192-Mb/s serial stream. The HFMT interface interleaves two pairs of these 8.192-Mb/s signals into a 16.384-Mb/s serial stream. Seven such signals are developed for the seven pairs of channel controller signals in this interface and are applied to both the 0 and 1 side HFMT packs. The 28 DS1 PCM transceivers and the 21 E1 PCM transceivers correspond to 28 or 21 NPC positions respectively in the HMXR that are provisioned by DACS II commands.

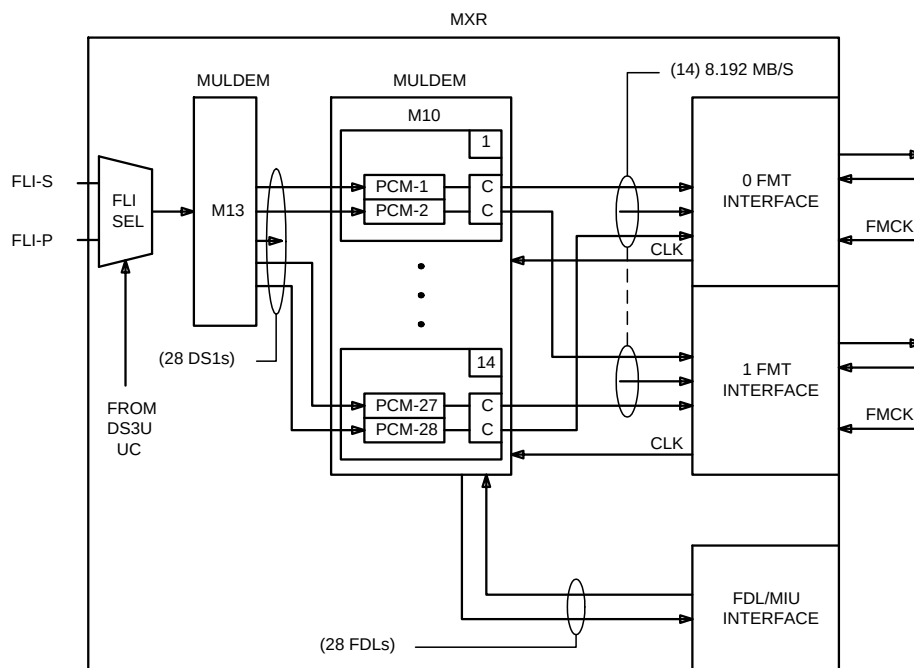


Figure 1-25. Simplified MXR Block Diagram

In the direction of transmission from the CCN, the HMXR performs the reverse functions to produce one DS3 signal from the DS0 channels delivered by the CCN. The DS0 channels received from the HFMT packs on the seven 16.384-Mb/s serial data streams are converted to fourteen 8.192-Mb/s signals that connect to the fourteen channel controllers of either the DS1 or E1 type. Signals

are received from both HFMT packs, the channel controllers select the source based on the CCN status bus. The channel controllers further demultiplex those data signals into the 4.096-Mb/s signals and apply them to the respective PCM transceivers. The M13 muldem multiplexes the signals from the PCM transceivers into the 44.736-Mb/s unipolar stream that is applied to both the service and protection FLI packs. This M13 muldem contains the necessary DS1 or E1 buffers for storage and the circuitry for bit stuffing to accomplish the mux/demux functions.

HFMT Pack. The hybrid formatter pack contains HMXR interface circuitry, four receive formatters feeding the CCN, four transmit formatters from the CCN, a clock generator, and an HDS3U UC interface. In the direction of transmission toward the CCN, the interface produces fourteen 8.192-Mb/s streams from the seven 16.384-Mb/s signals from the HMXR. Circuitry for 2:1 selection of the 16.384-Mb/s signals from the service or protection HMXR packs accomplish protection switching of the HMXR pack on the CCN side. Each of the four receive formatters takes signals from the HMXR interface circuitry (of 1-1/2 HMXR packs) and applies them to one of the four receive ports to the CCN network. Each of these CCN ports is the standard interface provided for any of the IFTU or DSPU units in the frame. The four CCN ports are 1024 time-slot, 8.192-Mb/s ports.

In the direction of transmission from the CCN, each of the four transmit formatters receives a 1024 time-slot, 8.192-Mb/s signal from one of the four CCN ports. Signals from these hybrid formatter circuits are split into six signals that are connected to 2:1 selection circuitry for protection switching of this direction of transmission to the HMXRs. The selected signals are converted by the HMXR interface circuitry that produces the seven 16.384-Mb/s signals for the HMXR packs.

There are two HFMTs in the HDS3U, each one associated with one side of the CCN. These form a protection group to protect against the loss of service owing to the failure of a single HFMT pack. The HFMT is switched with the CCN side which means that its failure causes the CCN side to switch and that the HFMT switching follows the CCN switching (initiated by other causes). The clock generator in the HFMT produces a local frame sync and an 8.192-MHz clock. These signals are distributed from the HFMT on each CCN side to the six service HMXRs and one protection HMXR in the unit. The HMXR selects the timing signals from the active HFMT and in turn produces a 44.736-MHz clock that is used for timing the HMXR's DS3 output signal.

Protection Switching

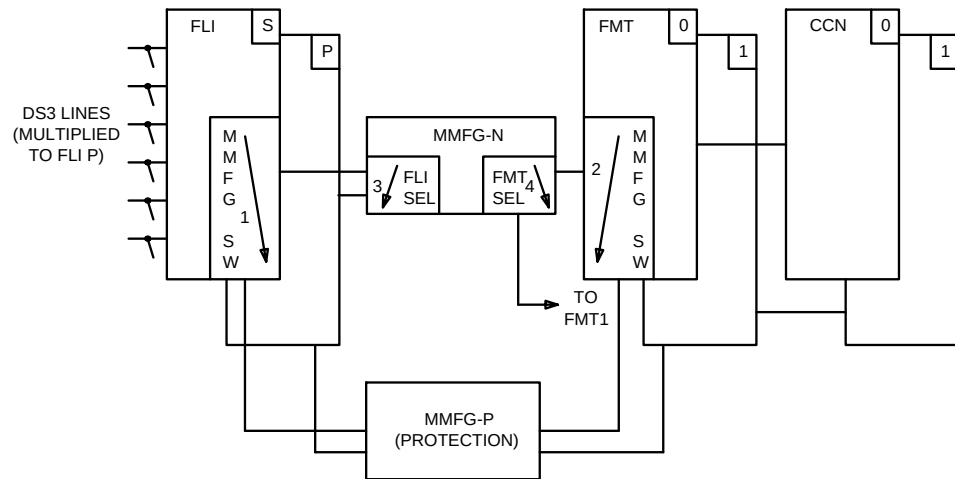
The standby packs in the HDS3U protect against the loss of service owing to a failure of any single pack. The strategy is implemented by having the following protection groups: the FLIs (1:1 protection), the MMFG (HMXR) group (1:6 protection), the HFMTs (1:1 protection), and the power units. Subsequent paragraphs describe the first three failure groups, and Figure 1-26 shows how the protection circuitry is placed to accomplish switch around of service. The

power protection is based on the availability of reserve power. Three power units in the HDS3U are diode OR'd together to supply the HDS3U although only two are required for the load.

The FLI protection switching maintains service if one of the FLI packs fails in the HDS3U. This switching is accomplished by relays in the FLI packs and switching circuitry in the HMXR packs. The switching is so fast that the transmission may only perceive a framing error. This switching is under control of the HDS3U UC, but if the UC is not present, the service FLI is automatically selected. If either FLI loses power or is physically disconnected, the select signal from the UC is overridden and the other FLI is automatically selected.

The MMFG protection switching maintains service if there is a failure of any single MMFG. There is one protection MMFG for the six service MMFGs. The MMFG includes the HMXR packs and will be switched out as a group if any pack in the group fails. This switching is accomplished by circuitry on both sides of the HMXR in the FLI and HFMT packs. To accomplish this switching, the HDS3U UC coordinates the switching operations on these packs and loads provisioning into the protection HMXR to match that of the HMXR to be switched out. The overall operation is managed by a fail-safe, lock-and-key mechanism administered by the HDS3U UC. This mechanism is a step-by-step procedure in which the UC unlocks the involved packs and loads the provisioning information, but the switching can be locked again if any involved pack cannot be unlocked. Conversely, the UC can override locked conditions if one or more of the FLI and HFMT packs are failed. However, the procedure also prevents a failed UC from falsely initiating a switch. The HMXR switching is so fast that the transmission may only perceive a framing error.

The HFMT protection switching maintains service if one of the HFMT packs fails in the HDS3U. The 0-side and 1-side HFMT packs are part of the CCN failure group and are switched with the CCN side. The switching is controlled by the DACS II main controller that monitors the status of all CCN packs on both sides. If the MC is failed or out-of-service, the switching is automatically controlled by the error status of the CCN side (based on the status of all the packs on each side).



NOTE: SWITCH CONNECTIONS 1 AND 2
REQUIRED FOR MMFG SWITCHING

Figure 1-26. Protection Switching Circuitry

Commands and Messages

Introduction

DACS II is an interactive system controlled by software commands. There are two message languages that can be used by a user to communicate with DACS II. These are the PDS (Program Documentation Standards) and the MML (Man-Machine Language). Each language has a set of input commands and output messages that are used to communicate with DACS II. An *input command* is a communication between a user and DACS II. *Input commands* are sent from a user to DACS II. Output messages are originated by DACS II and sent to the user. This section gives an introduction to the format of the input commands and output messages.

Comprehensive discussions of input commands and output messages can be found in the PDS and MML versions of the DACS II command and message manuals. This section does not replace those documents, but it provides an overview to their information.

DACS II Administrative Links

The DACS II can be administered (managed, operated) from a local terminal or remotely from an OS (operations system) connected via an administrative link. Six physical links can be connected to the DACS II frame. Links 1 through 4 are asynchronous, and links 5 and 6 can be asynchronous or synchronous depending on the communications interface. Sixteen virtual circuits may be established on a synchronous link.

A level of message screening can be assigned to each link. A user may choose to always receive responses to his/her commands, to receive selected messages, or to receive all messages from the other links. Autonomous messages may be blocked for a particular link to prevent other output messages from being interspersed among the user's messages. Some examples of uses of an administrative link are:

- Common equipment and feature equipment provisioning and maintenance
- Equipment and channel status information
- Facility provisioning and maintenance
- Facility performance readings.

An output message is sent from the DACS II over one or more administrative links in response to one of the following occurrences:

- An input command

The output message reports that the input command was either

completed successfully or denied; additionally, it may contain information requested by the input command. A *normal response* is an output message reporting a successful completion; an *error response* is an output message reporting a denial.

- An autonomous change in DACS II operation state

The output message reports the information on DACS II system operation state changes which includes alarms and other trouble indications. This output message is referred to as an *autonomous response*.

Formatting Conventions

To interpret the commands presented in this document, you should be familiar with the formatting conventions presented in the following paragraphs. Each command is presented in actual input command format with accompanying explanations of keywords and variables providing sufficient information to fully understand the activity.

Uppercase and Lowercase Characters

In the command format of this manual, uppercase and lowercase letters distinguish between information that is constant (uppercase) and information that is variable (lowercase). Any character written in uppercase appears on the output device exactly as it is written.

Delimiters

Delimiters are used to enclose a field in a command.

- [] Brackets indicate an optional field, one which may or may not be used in the input command or appear in the output message.
- { } Braces indicate a field containing alternate choices. For input commands, the user must select one of the choices. In output messages, braces indicate that only one of the fields within the braces will appear.
- < > The less than and greater than symbols enclose an abbreviation representing information too lengthy to display in the manual. These delimiters are never used in actual DACS II input commands or output messages but are used only in describing the command format in this manual.
- () Parentheses **are** part of the message text and must be entered where shown.

Using the Commands

Input Command Mode

The input command requests an action to be performed; this command contains necessary information for DACS II to accomplish the requested action. The user has two basic modes for inputting commands: the command mode and the menu/prompt mode.

Command Mode

The command mode is for the experienced user or machine-machine operation. A command must be selected along with variables and entered within a single line. The user types a single-line command with the only carriage return occurring at the end. "Single-line" refers to the input *command*, not to the display of the command. *A long single-line command may extend for several lines on a display terminal.*

DACS II accepts up to 250 characters of input per command. If an input command exceeds 80 characters (the standard width of most terminal screens), the input will continue on the next line of the display beginning with the 81st character. However, the command line can be broken at a convenient place by typing a backslash (\) followed by a carriage return. The display of the input command will continue on the next line, but the command will be interpreted as a single-line command. If 250 characters is not sufficient or if the user finds entering long commands error-prone, the single-line command can be broken up into several smaller commands.

Entering a carriage return without the backslash terminates the input and causes the line to be interrupted. An exclamation point (!) also terminates the input command (i.e., DACS II interprets the carriage return and ! ; as the end of the command). If the carriage return is used, ! is echoed back to the terminal.

Menu/Prompt Mode

This optional on-line help mode assists the user in completing the input command. The menu/prompt mode aids the user by providing a list of alternative parameters or keywords.

The user starts the menu/prompt mode by entering a question mark (?) in the command line at the point in question. In response, DACS II presents a list of possible keywords. This list is presented to the user in menu or prompt form. At this point, the user may continue or return to the command line. If the user continues, he/she should refer to the detailed examples (menu form and prompt form) in the *On-Line Help Feature* section.

Aborting an Input Command or Output Message

The **ABT** command is entered to interrupt a system response or abort an input command. If **ABT** is entered for a particular link, the output from this link will be interrupted just after **ABT** is entered or after one or two output lines. At other links, the output messages may or may not be interrupted. When the **ABT** option is used, the command generating the output will be completed unless the autonomous message, **CMD ABT STOPPED**, appears.

For a nonabortable command, the output message will not be affected.

If a nonabortable message is being output but DACS II is executing an abortable command, **ABT** will stop the execution of the abortable command and **CMD ABT STOPPED** will be output on all links.

Input Command Format

The general format of an input command is:

VERB:FRM xy,SEQ ww:DATA[]!

VERB is the action word telling the system to do something; add, change, cross-connect, restore, etc.

The **FRM xy** field identifies the DACS II frame to which the command is being sent. A DACS II frame is identified by a 2-digit number whose range is from 00 to nn. This number is assigned to the frame when it is placed into operation.

The sequence field, **SEQ ww**, assigns an identifying 2-digit number to the command. The number is arbitrarily chosen by the operator. This field is commonly used when two or more remote operators using an OS are sharing the same administrative link. Sequence numbers enable the operators to keep track of their commands.

The frame and sequence fields are optional. If the sequence field is omitted, a "00" number is assigned to the command by default.

The **DATA** field consists of keywords and numbers as required by the command. A delimiter, brackets [] in this case, encloses variable optional information that is required by the verb to execute that command. All variables are positional within the command line.

Colons are used to separate the variables (also called group, block, field); but if they are logically connected, they are separated by commas. The colon (:) is used as a variable field delimiter.

An Example of An Input Message

RST::FRM 05,SEQ 12:NPC 097! PF

The above command asks DACS II to restore to service (**RST**) network processing circuit number 97 (**NPC 097**) in DACS frame number 5 (**FRM 05**). The operator has arbitrarily assigned the sequence number 12 (**SEQ 12**) to the command.

Keywords

Input commands consist of *keywords* combined with equipment and circuit identification. The verb must come first, followed by the identification block and the sequence block. After that, the keywords can be entered in any order as long as the argument (if required) follows the keyword with a space (minimum of one) in between. A keyword is an alphanumeric string of characters representing:

- Verb (also called command or action verb)
- Entity identification
- Address specification
- Result of a command.

Command verbs are keywords that tell the system to do something.

Entity identification is a keyword that identifies a specific system or circuit pack within the system. For example, the keyword **NPC** refers to a network processing circuit pack.

Address specification is a keyword that refers to a specific address. **TP 03**, for example, refers to a specific test port (Test Port 03).

Keywords sometimes report the results of a command. In response to a diagnostic command, DACS II might return the keyword **ATP** to indicate "All Tests Passed."

Input Command Control Characters

In addition to input commands, DACS II responds to the following input command control characters or symbols:

- **& (or CONTROL-x or CTRL-x)**. *Abandon message*. Entering any one of these characters causes DACS II to abandon the message being entered and return the system prompt.
- **CONTROL-h or CTRL-h, UNDERLINE, BACKSPACE**. *Erase last character*. Depressing the CONTROL and h keys simultaneously or depressing the UNDERLINE key or the BACKSPACE key causes DACS II to ignore the last character of a message and echo an underline (_). Entering *n* number of erase character symbols causes DACS II to ignore the last *n* characters of a message.

- **BREAK.** *Interrupt output message.* The BREAK key interrupts an output message. The message continues after an allotted amount of time has passed or after the operator has finished entering an input command.

Input Command Acknowledgements

After DACS II has received the execute character of the input command, an immediate reply will appear with one of the following acknowledgements:

- **PF** (Printout Follows). DACS II received the input command and processed it. An output message will soon be returned. The output message will report the results of the work initiated by the command. If the system cannot complete the command, the reason will be printed.
- **RL** (Retry Later). DACS II cannot execute the requested command now because it does not currently have system resources available.
 - The system could be temporarily overloaded.
 - The command queue could be excessively long.
 - The requested program may be busy, etc.

Wait, and enter the command later.

- **NG** (No Good). The basic format of the command is correct, but the system is in trouble. An example is when the MP is in the MCOND state.
- **NA** (No Acknowledgement). The command has been accepted by the parser, but processing control has been lost, thus making correct acknowledgement impossible. An example is when the communication interface (CI) has detected a local area network (LAN) failure.

If either NA or RL is sent as an input acknowledgement, a normal or error output message may not be sent. Also, if the input command itself is in error, the input acknowledgement will indicate this fact and either the normal or error message will not be sent.

Acknowledgement

Meaning

?V<cr><lf>	Command code error
?D<cr><lf>	Parameter block error
?E<cr><lf>	Error in command, cannot be identified as either ?V or ?D
?P<cr><lf>	Parity error occurred in the input
?T<cr><lf>	The time between characters exceeded timeout threshold
?X<cr><lf>	Command aborted in response to a <cancel> or <break> from user.

Output Messages

There are three types of DACS II output messages. The normal or **completion message** indicates that the input command from the user has been executed and completed. An error response or **denial message** means that the input command has been denied and gives the reason or condition code for the denial. An **autonomous message** reports a change in the operational state of the DACS II.

The format for an output message is:

PA TIME FRM, SEQ LINK IDENT DATA TERM

The priority of action (PA) field is a 2-character field indicating the priority level as follows:

*C	Immediate action, critical alarm
**	Immediate action, major alarm
*	Action, minor alarm
M^	Results of manual action
A^	Autonomously generated action message
I^	Autonomously generated information message.



NOTE:

The ^ indicates a space.

TIME is the time of day using a 24-hour clock with an hours:minutes:seconds (**hh:mm:ss**) format.

The 2-digit **FRM** field identifies the DACS II frame that sent the message.

The **LINK n[vv]** field contains a digit from 1 through 6 that identifies the DACS II administrative link that originated the command. A blank in the **LINK n[vv]** field indicates an autonomous message generated within DACS II. The **[vv]** indicates the virtual circuit number from 1 through 16 when **n** is 5 or 6..

The **IDENT** and **DATA** fields identify the action verb with its associated keywords, variables, and data that the output message is responding to.

The termination field, **TERM**, indicates the results of a requested command. Some possible terminations are:

COMPL	Requested action is completed.
STOPPED	Requested action stopped before normal completion.
IN PROGRESS	Requested action is in progress.
[] DNY	Requested action is denied. The reason for denial is indicated in the output message. The brackets signify various keywords and data used to explain the reason.

Completion Message

A possible response to the input command **RST:FRM 05,SEQ 12:NPC 097!**
(restore to service network processing circuit number 097 in DACS II Frame 05)
could be:

M 07:39:20 05,12 2 RST NPC 097 TYPE DE100 COND 00 COMPL

M, the priority of action, indicates the result of a manually entered command. The time (07:39:20), the DACS II frame number executing the command (05), the message sequence number (12), and the link number (2) follow. The remaining fields reflect the input command that originated the output message and the results of the command. In this case, network processing circuit number 097 (NPC 097), a standard DE100 digroup card (TYPE DE100), was restored to service (RST). Restoration of the NPC occurred without error (COND 00), and the command was successfully completed (COMPL).

Denial Message

A possible response to the input command **RST:FRM 05,SEQ 12:NPC 097!** could be:

M 07:39:20 05,12 2 RST NPC 097 TYPE DE100 COND 02 DNY

The denial reason in this example (COND 02) means that the NPC is not equipped. The other fields in the message are the same as the completion message.

Autonomous Messages

This example of an autonomous output message (65041) reports that a major or minor alarm for a parameter has been idled or cleared:

Nonhierarchical Format

I 07:39:20 05,12 ALM IDLD <parameter> NPC 097 COMPL

Hierarchical Format

I 07:39:20 05,12 ALM IDLD <parameter> NPC 01423 COMPL

Table 1-4. Functional Categories of Messages

Message	Verb	Keyword
Input Denials	*	BAD, CMD, STOPPED, INACT
Startup Messages	*	STARTUP, BOOT, RESET
Error Messages	*	ERR, OVERLOAD, RESET
One-Way Cross-Connect Two-Way Cross-Connect	OCON TCON	FROM, TO, MPM
One-Way Terminated and Two-Way Terminated Cross-Connections	OCNT TCNT	FROM, TO, MPM
Broadcast Cross-Connect	BCON	FROM, TO, TOX, BCAST, COND
Roll	SW	OLD, NEW, TWAY, INCL, FRC, OOS
Bridge	SW	BCAST, OLD, NEW
Alternate Cross-Connect	ACON	OLD, NEW, INCL, CUS, RDC
One-Way Disconnect Two-Way Disconnect	ODIS TDIS	FROM, TO, BCAST
Broadcast Disconnect	BDIS	FROM, TOX, BCAST
Change Circuit Parameters	CHG	TCON, OCON, FROM, TO
Change Circuit Parameters	CHG	BCON, SWCH
Edit Macro or Alternate Map	ED	MACRO, MAP, APPEND, OPEN DELETE, LIST, SAVE, MOVE
Two-Way Monitor Test Access	CTST TTST	FAD, FROM MON, TP, TG, ASSGN
Two-Way Split Test Access	TTST	SPL, TP, TG
Two-Way Hub Test Access	TTST	HUB, TP, TG
Two-Way Terminate and Leave Activate/Release Test Access	TTST	TLA, TLR, TP, TG, NUTST UASGN, PTLA, NTLA

* Autonomous Output Message

Continued on next page

Table 1-4. Continued

Message	Verb	Keyword
Two-Way Test Port Release Test Access	TTST	TPR, TGR, TP, TG, ALL, COND
Two-Way Looped Test Access	TTST	LPD, TP, TG
Growth	GRTH	FRAME, SYNC, UNIT, TB NPC, TP, TG, TLI, FTMI, FC
Degrowth	DGRTH	SYNC, UNIT, TB, TLI NPC, TP, TG, FTMI, TYPE
Remove	RMV	MC, LINK, SYNC, CCNI CCB, TSI, TSIS, UNIT CRO, CCN, UC, FC, NPC CCI, ETSI, ETSIS, ECCN, FTMI
Restore	RST	MC, LINK, SYNC, CCNI CCB, TSI, TSIS, CCN UNIT, NPC, TLI, CRO ALL, UC, FC CCI, ETSI, ETSIS, ECCN, FTMI
Configure	CFR	XC, SYNC, FRAME
Add	ADD	LINK, LEV, LANG, USER
Edit/Delete	DLT	NPC, USER, FPKG
Change Unit, CCN, NPC Parameters, User/Link profile. and Memory Allotment	CHG	FRM, SYNC, UNIT, SETOP NPC, PASSWD, SCR GR, MAP SPACE
Activate Map. Execute Macro, Login, Logoff	ACT,EXC, STOP,LOGIN, LOGOFF	MAP, MACRO, USER
Diagnose	DGN	FRM, MC, LINK, CI, PMEM, SMEM, XC, SYNC, CCNI, CCB, TSI, TSIS, UNIT, NPC CCI, ETSI, ETSIS, ECCN, UC, FTMI, FC

Continued on next page

Table 1-4. Continued

Message	Verb	Keyword
Utilities	UTL	TOD, ACO, INIT, WHO QRY, DATE, BMTR, CLR FRM, VERSN, RCY, PASSWD CNFGR, ALM, FPKG
Utilities	UTL	QRY, CMAP, DMAP, FROM TO, BCAST, TYPE, ALL, SYNC, EQD, UNITS, TSIS MARK
Utilities	UTL	QRY, EQD, TPS, TGS, OPTS PEST, FAIL, OOS, ALMS ET SIS
Utilities	UTL	QRY, ESR, STR, ECCN
Utilities	UTL	CLR, STATE, LOC
Utilities	UTL	BOOT, CLR
Alarm	ALM	CGA, DC, AR01, MJ, MN IDLD, ECCN, OOS, BMTR
Audits	AUD	QRY, ALL, FTU, NPC S
Frame Audits	FRADTS*	DGN, FRCMP, BMCMP, MC
* Autonomous Output Message		

NPC Addressing

Two addressing or numbering schemes for network processing circuits are available: the **nonhierarchical** and the **hierarchical**. These numbering methods are used to provide a means of locating network processing circuits.

Nonhierarchical Numbering

The **nonhierarchical** uses consecutive numbering to count through the units in the frame. Each unit has a fixed starting number (for example, 161 for unit 2; 321 for unit 3; 481 for unit 4). The starting number is the same for DS3U, FTU, or DSPU type units.

Within the nonhierarchical numbering scheme, there are 3-digit and 4-digit (extended) formats. The extended format is used for CEF frames. Therefore, NPC numbers represented by [s]abc in commands show both formats of the nonhierarchical numbering scheme (the [s] is used with a Capacity Expansion Frame).

Hierarchical Numbering

The **hierarchical method** uses a 3-part number: the unit number (uv), the module or group number within the unit (m), and the NPC number within the module (np) for a total of five digits (uvmnp).

On-Line Help Feature

Description

DACS II provides on-line assistance to the user when constructing commands at the terminal. This assistance is in the form of a menu-driven help routine. Different menus are displayed during the routine to provide the user with information on all of the command fields. The menu items include: command verbs, applicable keywords for a command, definitions of keywords, and the possible choices or number range for a variable field. Inappropriate selections bring error messages.

The help routine can be used to the degree needed to complete the command: either through the entire command in every field or only for a particular part of the command. Help will probably not be needed after some experience is gained at entering commands, since all the commands are documented and the direct entry of commands is so much faster.

The question mark and RETURN are entered to invoke the different levels of the help routine. A question mark is entered by simultaneously depressing **SHIFT** and **?**. The question mark is used to initiate the routine or to get more information, and RETURN is used to see the alternative choices at a given point. The dialogue can be terminated either by typing CTRL-x or by completing the current command line when it is displayed. These functions are demonstrated in the following portion.

Summary: The Help Feature

By entering **SHIFT** **?**, the user may ask DACS II for help at any time before or during the construction of an input command.

In the help mode, DACS II will offer the user menus for the selection of the message keywords and/or prompt for values of variable fields. Entering **SHIFT** **?** provides a greater detail of information on the keywords or variables.

A user may select a keyword from a menu by selecting its index number or by entering the keyword itself.

The **RETURN** key displays the command line that has been constructed so far. The user may then enter the remaining keywords and values to complete the command or may enter **SHIFT** **?** to return to the menu/prompt mode.

Constructing an Entire Command Using Help

The following sequence demonstrates the use of the menus in the help routine to construct a simple UTL (utility) command. Only portions of long menu lists are shown here, but these examples still serve to demonstrate how selections are made.

- (1) To invoke the help routine at the start level, enter **SHIFT** **?**. DACS II responds with OK and the following menu:

Select from:

1. ABT	22. INHSW	43. TTST
2. ACON	23. LOGIN	44. UTL
3. ACT	24. LOGOFF	45. X

.
.
.

21. INH 42. TDIS

Selection?

- (2) To obtain more explanation, enter **SHIFT** **?**. DACS II responds with OK and the following list (The list is long; DACS II prompts the user to enter **RETURN** to page through it):

Select from:

1. ABT	(abort the current command)
2. ACON	(perform an alternate cross-connection)
3. ACT	(activate map)

.
.
.

44. UTL	(perform a general utility)
45. X	(priority conference switch)

Selection?

- (3) Here you can enter either 44 or UTL followed by **SHIFT** **?**. The DACS II responds with this menu:

Select from:

1. ,
2. :
3. FRM
4. SEQ

Selection?

- (4) To bypass the frame and sequence number, which is normally done unless that information is needed for records or to direct the command to a different location, the user enters either **2** or **:** followed by **SHIFT** **?**. The question mark prompts DACS II to respond with a list of possible keywords that could appear next in the command. The list is long; DACS II prompts the user to enter **RETURN** to page through it.

Select from:

1. ACO	22. BX	43. CVP	64. EOL
2. AI	23. CCB	44. DATE	65. ER
3. AIS	24. CCI	45. DBASE	66. ERCL
.	.	.	.
.	.	.	.
.	.	.	.
104. PPBK	125. NPCTG	146. SCDG	167. STR
105. LV	126. OOF	147. SCHED	168. SWER
169. SYNC	190. UNIT		
170. SYSTEM	191. UNITS		
.	.		
.	.		
.	.		
174. TLI	195. WHO		
175. TN	196. XC		
176. TO	197. XCSB		
177. TOD			
.			
.			
.			
188. UBX			
189. UC			

- (5) If the user enters a keyword and **?**, DACS II responds with OK and supplies the only appropriate keyword(s) to complete the command. For example, if the user enters WHO and **SHIFT** **?**, DACS II responds:

UTL: :WHO, QRY!

Command-line complete. Submit (YES/NO)?

- (6) To enter the command, the user enters Y followed by **RETURN** .

Obtaining Help at a Particular Point on a Command Line

In addition to being used to construct a command from scratch, DACS II's on-line help can be used to obtain information on particular fields of a command. If the command format is not known or if the keywords or variables are not clear, the help dialogue can be initiated at any point by entering **SHIFT** **?** .

Assume the user desires to cross-connect a multipoint circuit and enters the following command:

TCON: :FROM 001001, TO 002003, MPM(SYM, LEG), TRSP!

DACS II responds:

M 08:19:06 01,00 2 TCON INERR BAD SYNTAX 2 LN MSG:
TCON: :FROM 001001, TO 002003, =MPM=(SYM, LEG), TRSP! DNY

=MPM= indicates a problem.

The user can use the help feature to obtain information to reenter the correct command. He or she enters TCON: :FROM and **SHIFT** **?** . DACS II responds:

ds3u unit number =

The user desires a circuit using a DSPU NPC (digital signal processing unit network processing circuit), not a DS3U (digital signal 3 unit). He or she enters **RETURN** to see the next option which is:

ftu npc number (160+8 npcs on a ds3u unit) =

Another **RETURN** brings the desired option which is:

dspu npc number (first 2 npcs in every group of 20 on a dspu unit) =

To get more information at this point, the user enters **SHIFT** **?**, and DACS II responds:

dspu npc number (3-digit decimal integer, range 641-941) =

This is where the trouble occurred in the original command; one of the NPCs must be an MB-type in the range 641-941. The user enters 641 and **SHIFT** **?**.

DACS II responds:

dmb conference number =

The user enters **SHIFT** **?** to get more information:

dmb conference number (decimal integer, range 1-85) =

The user enters the conference number, 2. To view the current command line, the user enters **RETURN**. DACS II echoes the command line completed so far:

TCON: :FROM 6412

The user may complete the command by directly entering the remaining keywords and parameter values. By entering **SHIFT** **?**, DACS II proceeds with the menu and prompts for the remainder of the command:

Select from:

1. CUS
- .
- .
- .
8. TO
9. TRB
10. TRSP

Selection?

The user enters 8 selecting the TO keyword (TCON: :FROM 641002, TO . . .). The user then enters **SHIFT** **?** to ask for information in the next command field. DACS II responds:

ftu npc number =

The user enters **SHIFT** **?** to get information on FTU NPC values. DACS II responds:

ftu npc number (3-digit decimal integer, range 001-640) =

The user enters FTU NPC number 002 and **RETURN**. DACS II responds with the command line developed to this point:

TCON: :FROM 6412, TO 002

By entering **SHIFT** **?**, the user may continue to be prompted through the construction of the remainder of the command or may directly input the remainder of the command for execution:

TCON: :FROM 641002, TO 002003, MPM(SYM, LEG), TRSP!

Equipment Precautions

Electrical Discharges

The DACS II contains integrated circuits and other electronic equipment that are sensitive to static electrical discharges. Therefore, read the following caution BEFORE working on the system:

**CAUTION:**

Before touching any part of the frame including any circuit pack, reset switches, ACO, or LED TEST buttons, ALWAYS ground yourself to the frame with a WRIST STRAP provided with the equipment.

Removing and Installing Circuit Packs

You can easily damage circuit packs and other hardware by improperly removing and installing them in the frame.

The following describes how to correctly remove and install **4-inch** and **8-inch** high circuit packs with a single latch:

- **To Remove a Circuit Pack:** Unseat the circuit pack from the slot by carefully operating the latch. Then remove the circuit pack with one continuous motion. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.
- **To Install a Circuit Pack:** Remove the plastic shipping protector from the contacts of new circuit packs. Insert the circuit pack into the slot. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH. Raise the latch. Push on the bottom part of the circuit pack until the latch engages the slot. DO NOT push with the latch.

After the latch engages the slot, close the latch (push in) to seat the circuit pack. After closing the latch, with one thumb on the latch and the other thumb at the top of the circuit pack, press firmly to ensure that the circuit pack is fully seated.

The following describes how to correctly remove and install **12-inch** high DS3U and **16-inch** high ECCN circuit packs:

- **To Remove a Circuit Pack:** Unseat the circuit pack from the slot by carefully operating both the top and bottom latch. Then remove the circuit pack with one continuous motion. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

- **To Install a Circuit Pack:** Remove the plastic shipping protector from the contacts of new circuit packs. Insert the circuit pack into the slot and ensure that the latches are positioned to allow insertion. **DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.** Open both latches. Push on the lower part of the circuit pack until the latches engage the slot. **DO NOT** push with the latches.

After the latches engage the slot, close the latches (push down top latch, push up lower latch) to seat the circuit pack together. After closing the latches, with one thumb on the top latch and the other thumb on the bottom latch of the circuit pack, press firmly to ensure that the circuit pack is fully seated.

A suffixal number after a circuit pack indicates a series version. Higher series versions can be substituted in slots labeled for a lower series version but not the reverse.

Recommended Memory Card Backup Strategy

Two memory cards should always be installed on the DACS II at all times except for short durations such as software installations and removing and restoring backed-up memory cards. The SMEM card should be removed on planned intervals for backup purposes and replaced with another memory card. In the event of a serious problem, the most recently backed-up memory card can then be used to restore the system to a known previous state.

Lucent Technologies recommends that the customer maintains a procedure of rotating a set of memory cards such that a memory card is removed and then placed in a safe place at regular intervals. This interval should be daily if frequent changes are made on the system. This interval may be extended longer than a day, if changes to the system are infrequent and any changes could be re-created manually in case of a failure. The oldest backed-up memory card in the backup set should be recycled back into the system each time a new backup is done.

In addition to a regular backup process where the cards are stored in a safe place in a close physical proximity to the frame, it may be prudent to perform backups at less frequent intervals and store them in a safe "off-site" location to guard against a catastrophe such as a fire. This off-site strategy should follow the customer's internal standard operating procedures in guarding against such catastrophies.

The life expectancy of PCMCIA memory cards is quite high. The memory cards used for DACS II have a Mean Time Between Failures (MTBF) of more than 30 years, if the number of write operations is modest. Write operations eventually wear the card out; the PCMCIA cards tolerate about 300,000 write operations before they wear out. When estimating the life of the PCMCIA memory cards the user should consider that a single cross-connect command generates one write operation. A utility query only generates read operations, which do not wear the card out. Also, under normal conditions the cards should tolerate at least 10,000 physical removals and insertions before the contacts wear out. The customer should ensure that the contact area of the memory cards in particular is kept free of dust and chemical contamination while they are stored to guard against contact failure.

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Acceptance

2

Perform Visual Inspection

Overview: Use this procedure to inspect the front and back of the frame for obvious structural damage.

Inspect Front of Frame

1. Check front of frame for damage (such as dents or broken mountings) resulting from transporting and mounting of equipment.
2. At front, look over shelf mountings to verify that shelves are properly aligned and securely mounted. Figure 2-1 shows the location of equipment in a fully equipped CEF (capacity expansion frame).
3. Verify that shelf designation labels are installed in front over shelf slots.

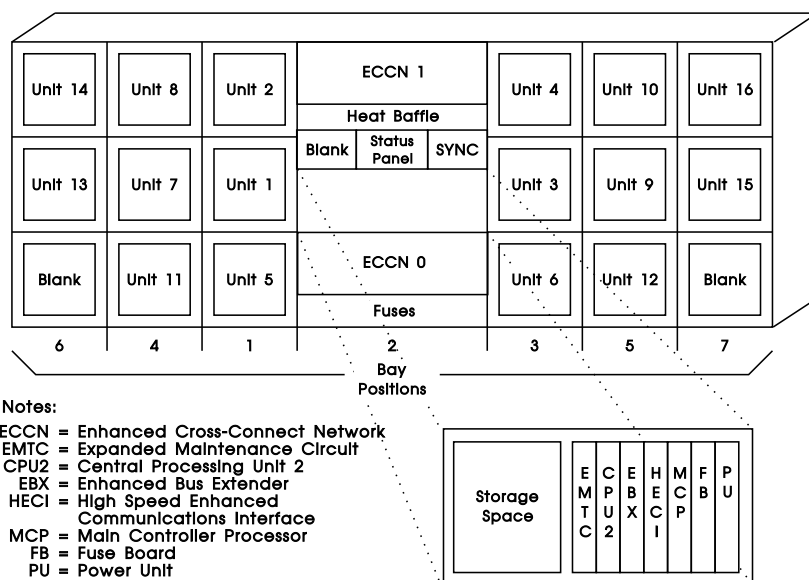


Figure 2-1. Fully Equipped CEF

Inspect Back of Frame

- At back of frame, do Steps 5 through 12.
- Check back of frame for damage such as dents or broken mountings.
- Look for broken or bent pins near the edges of each printed backplane panel; these pins can be damaged even with the covers installed.
- Verify that the metal covers are securely mounted over the backplane panels. Ribbon cables are used for connections between the shelves, and these connections are not likely to give trouble.
- For DSPUs (digital signal processing units), check that the wiring from these units to the main controller is neat and that no pins were damaged during wire wrapping. When these units are added to an existing frame, this wiring will be done by the installer.
- Verify that local TTY (teletypewriter terminal) is connected to TTY connector for Link 1 behind the main controller using an ED-2C646-30, G2 adaptor.
- If data sets (such as 202T) are required for remote connections or for equipment more than 50 feet (RS-232C specification) or 2,000 feet (RS-449 specification, 1200 baud) away, verify that data sets have been installed. Data set specifications are given with the information notes in SD-96662-01.

11. Connect data link cable (for example, M25B) to the TTY connector for the link (behind DACS II main controller). No adapter is required for RS-449 format, but ED-2C646-30 adapters are required for RS-232C format as follows:
 - Use a G1 (group 1) or G14 adapter for any interface via data sets (asynchronous or synchronous).
 - Use a G2 or G15 adapter for a direct TTY or CRT terminal (without data sets).
 - Use a G3 or G8 adapter for local operations systems such as SARTS (Switched Access Remote Test System) or TABS (telemetry asynchronous block serial) protocol link (asynchronous 4-wire – data only without data sets).

**NOTE:**

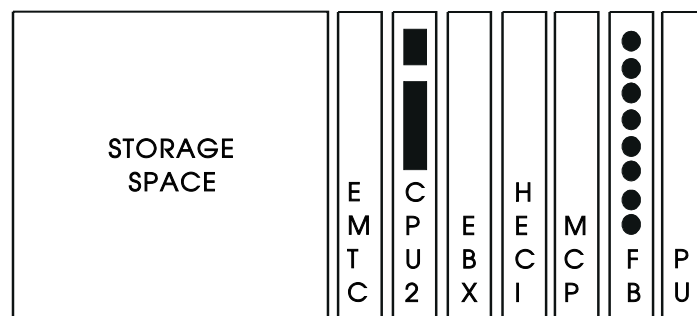
The G1 and G2 adapters interoperate with RS232C per EIA Pub. 12 and give maximum receiver margin and minimum pulse distortion. The G14 and G15 adapters contain termination and biasing networks to detect disconnected or unpowered RS232C equipment. The G1 and G2 adapters are recommended for use in normal installations where the equipment remains powered up.

12. Verify that cable adapter are securely mated at back of each facility terminating unit. Also verify that shield is grounded at DACS II frame or at line interface bay.
13. Talk with an installation representative to verify that cabling to line interface bay has been tested for continuity (buzzed and CGAs [carrier group alarms] registered when lines were opened).
14. Verify that DACS II and line interface bays have been stamped with office relay rack identification per office drawings.

Check Circuit Pack Installation

Check Main Controller Installation

1. Verify that the main controller has been installed. See Figure 2-2.



Notes:

EMTC = Expanded Maintenance Circuit
 CPU2 = Central Processing Unit 2
 EBX = Enhanced Bus Extender
 HECI = High Speed Enhanced Communications Interface
 MCP = Main Controller Processor
 FB = Fuse Board
 PU = Power Unit

Figure 2-2. Main Controller

Check Sync Circuit Pack Installation

Overview: Use this procedure to verify that sync circuit packs in the frame are properly installed and to query the units to see how they are configured.

1. From system layout information and installation records, determine the following on the sync:
 - The configuration, MASTER or SLAVED.
 - The number and types (digital line, office clock, etc.) of incoming signals for slaved timing.
 - Timing distribution, whether DACS II supplies timing to other equipment in the office.
2. Enter **UTL : :QRY, SYNC, TYPE!** to see the TB (time base) and TLI (timing link interface) type designations.
3. Read the query output using Table 2-1 for the TLI types and read the following:
 - The TB types are TB000 for domestic-stratum 3, TB100 for 2.048-Mb/s Interface - local office, TB200 for 2.048-Mb/s Interface - toll office, and TB300 for domestic-stratum 2.
 - The TLI types are given by the letter codes, and the signal formats are given by the associated number codes.
 - The SRC is the priority of TLI sources — from the highest (1) to the lowest (8).
4. Enter **UTL : :QRY, STATE, SYNC!** and read the sync configuration and status using Table 2-2.
5. If CFR (sync configuration) = MASTER, verify that a TB card is installed in the designated slots. See Table 2-1 for equipment codes.
6. Verify that there are duplicate TLI cards (on sides 0 and 1) for each incoming and timing distribution link. See Table 2-1 for equipment codes.
7. If TG68 or TG75 TLIs are used, verify that the packs are installed in the TLI 2 positions of the sync where terminations are provided for connection of coaxial cable.
8. If timing signals are to be distributed from the DACS II, verify that the correct code of TLI is installed and check connection of timing cables behind shelf slots. Both the TG70 and TG71 packs provide four multiplied outputs.

Table 2-1. Sync Circuit Packs

Circuit Pack	Code	Growth Type	Description
TB	TG60	TB000	TBS3 (Time Base, Stratum 3) — Domestic Use
	TG61	TB100	TBCL (Time Base, CEPT Local Office)
	TG62	TB200	TBCT (Time Base, CEPT Toll Office)
	TG63	TB300	TBS2 (Time Base, Stratum 2) — Domestic Use
TLI	TG64	TExyz	TXB1 (DS1 Timing Extractor)
	TG65	TPxyz	TXB2 (2.048-Mb/s Primary Block Timing Extractor)
	TG66	TCxyz	TXCC (64 kb/s Composite Clock Timing Extractor)
	TG67	TUxyz	TXUC (Unipolar Clock Timing Extractor)
	TG68	TRxyz	TXRS (BSRF [Reference Frequency] Timing Extractor)
	TG70	TD1yz	TDCC (64 kb/s Composite Clock Timing Distributor)
	TG71	TD2yz	TDS2 (2.048-Mb/s Sine Wave Timing Distributor)
	TG75	TPxyz	TXBT (Primary Block Extractor, 75-Ohm)

Table 2-2. Sync Status Output

Message Field	Outputs and Meanings
CFR STRATUM MODE SOURCE	MASTER or SLAVED sync configuration. STR2, STR3, CEPT TOLL, or CEPT LOCAL. HOLDOVER, FAST, or NORMAL for each DPLL. Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE).
IN SERVICE-DPLL	DPLL side 0 side 1, TB side 0 side 1, SOURCE side 0 side 1; presence of a 0 for side means out-of-service and a 1 means in-service.
ACTIVE-LINK	Gives TLI No. and its SSP (0, 1) which is active on each side (0 and 1).
PLL TIMING ERROR	Presence of 0 for side means no error and presence of 1 for side means error.

Check FTU Circuit Pack Installation

Overview: Use this procedure to verify that all FTU circuit packs in the frame are properly installed (Figures 2-3 and 2-4).

1. Determine which unit and FTMs (facility terminating modules) are to be equipped. See Table 2-3 for unit and FTMI numbering (table only shows nonhierarchical numbering).
2. Review the three versions of FTUs shown in Figures 2-3, 2-4, and 2-5. Figure 2-3 shows the FTUs used in the original side bays, and Figure 2-4 shows the IFTUs (integrated FTUs) used in flexible side bays.
3. Verify the **TG81** code FTMI and the **TG79** code of FCs (format converters) are installed for the equipped FTMs; see Figure 2-3 or 2-4
4. Verify the circuit pack dual digroup cards (for example, DPC) for the equipped NPCs are installed in the NPC slots.



NOTE:

Each circuit pack card contains the circuitry for two NPCs. For 2.048-Mb/s Interface and Enhanced 2.048-Mb/s Interface, the last eight NPCs (four DPCs) are not equipped.

FTM 4	NPC (121-140)	0 F C (4)	F T M I (4)	1 F C (4)	NPC (141-160)
FTM 3	NPC (081-100)	0 F C (3)	F T M I (3)	1 F C (3)	NPC (101-120)
FTM 2	NPC (041-060)	0 F C (2)	F T M I (2)	1 F C (2)	NPC (061-080)
FTM 1	NPC (001-020)	0 F C (1)	F T M I (1)	1 F C (1)	NPC (021-040)

Figure 2-3. Original FTU

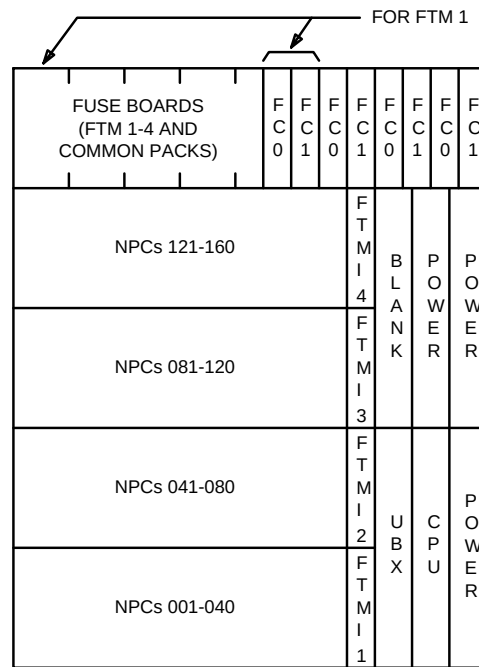


Figure 2-4. Integrated Facility Terminating Unit

FUSE BOARDS 1 - 17					B L A N K	P O W E R	P O W E R	B L A N K	
FTM 4	NPCs 121 - 140	F C O	F T M I 1	F C 1	NPCs 141 - 160		BLANK		
FTM 3	NPCs 80 - 100	F C O	F T M I 2	F C 1	NPCs 101 - 120				
FTM 2	NPCs 41 - 60	F C O	F T M I 3	F C 1	NPCs 61 - 80		U B X	C P U	B L A N K
FTM 1	NPCs 1 - 20	F C O	F T M I 4	F C 1	NPCs 21 - 40				

Figure 2-5. Integrated Facility Terminating Unit 2

Table 2-3. NPC Location in Unit

Hierarchical NPC Number	Unit Number	FTMI Number
001-032	1	1
041-072	1	2
081-112	1	3
121-152	1	4
161-182	2	1
201-232	2	2
241-272	2	3
281-312	2	4
321-352	3	1
361-392	3	2
401-432	3	3
441-472	3	4
481-512	4	1
521-552	4	2
561-592	4	3
601-632	4	4
641-672	5	1
681-712	5	2
721-752	5	3
761-792	5	4
801-832	6	1
841-872	6	2
881-912	6	3
921-952	6	4
961-992	7	1
1001-1032	7	2
1041-1072	7	3
1081-1112	7	4
1121-1152	8	1
1161-1192	8	2
1201-1232	8	3
1241-1272	8	4

Continued on next page

Table 2-3. Continued

Nonhierarchical NPC Number	Unit Number	FTMI Number
1281-1312	9	1
1321-1352	9	2
1361-1392	9	3
1401-1432	9	4
1441-1472	10	1
1481-1512	10	2
1521-1552	10	3
1561-1592	10	4
1601-1632	11	1
1641-1672	11	2
1681-1712	11	3
1721-1752	11	4
1761-1792	12	1
1801-1832	12	2
1841-1872	12	3
1881-1912	12	4
1921-1952	13	1
1961-1992	13	2
2001-2032	13	3
2041-2072	13	4
2081-2112	14	1
2121-2152	14	2
2161-2192	14	3
2201-2232	14	4
2241-2272	15	1
2281-2312	15	2
2321-2352	15	3
2361-2392	15	4
2401-2432	16	1
2441-2472	16	2
2481-2512	16	3
2521-2552	16	4

Check ECCN/CCN Circuit Pack Installation

Check Multibay Circuit Pack Installation

Overview: Use this procedure to verify that all the multibay circuit packs in the frame are properly installed. Procedures to install circuit packs are included in the *Provisioning* section.

1. Locate ECCN (expanded cross-connect network) in the switch bay. See Figure 2-6.

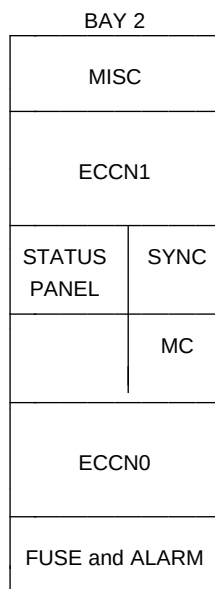


Figure 2-6. Switch Bay

2. Verify that the BT (bus terminator, BBR1 code) packs are securely installed in the designated far-left and far-right slots on each side of the network (ECCN0 and ECCN1). See Figure 2-7 for ECCN circuit packs and Figure 2-8 for CCN circuit packs.
3. Verify that the CCI (clock control interface, BBS1 code) pack is securely installed in the designated slot on each side of the network (ECCN0 and ECCN1).

- 4. Verify both active and inactive ETSI (expanded time slot interface) circuit packs are installed for each equipped unit.

NOTE:
The ETSI slots are assigned on each side of the common CCI pack to roughly match the associated unit positions and ordering of the units in the CEF configuration.

BT 1
ETSI 01
ETSI 02
ETSI 05
ETSI 07
ETSI 08
ETSI 11
ETSI 13
ETSI 14
CCI
ETSI 16
ETSI 15
ETSI 12
ETSI 10
ETSI 09
ETSI 06
ETSI 04
ETSI 03
BT 2

Figure 2-7. Location of Circuit Packs on ECCN Shelf

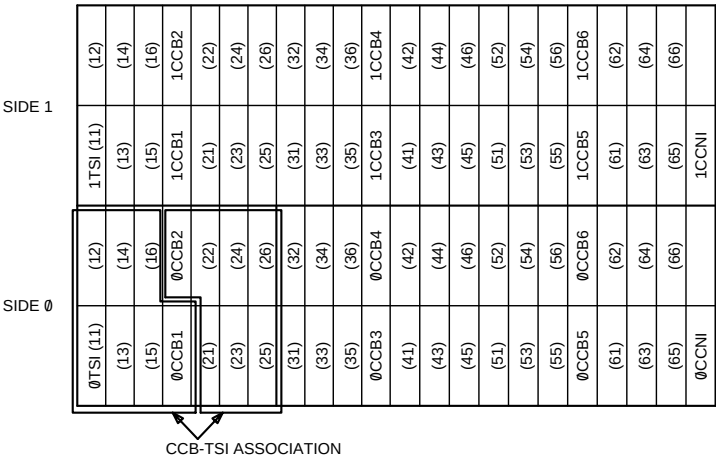


Figure 2-8. Location of Circuit Packs on CCN Shelf

Check Single-Bay Circuit Pack Installation

Use this procedure to verify that all single-bay circuit packs in the frame are properly installed.

1. Locate the CCN2 (cross-connect network) in the frame and notice the organization within the network; see Figure 2-9.

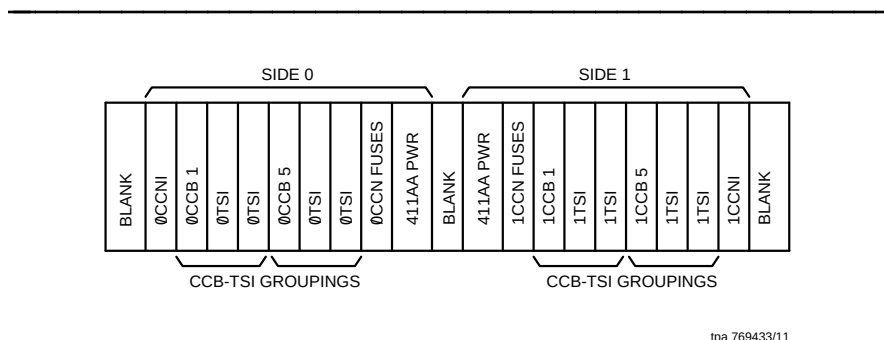


Figure 2-9. CCN2 Network

2. Verify that the CCNI (cross-connect interface) card (UM30 code) is installed in the designated slots on both sides of CCN2.
3. Verify that the circuit packs for CCB 1 and TSI 11 are installed on both sides of CCN2 to allow cross-connections within unit 1. The code of the CCB cards is UM26 and the code of the TSI cards is TM660.

⇒ NOTE:

The TSI designation numbers indicate how the cards are connected; for example, TSI 11 connects data from unit 1 back to unit 1.

4. If unit 5 (bottom shelf) is also to be equipped, verify that the circuit packs for slots CCB 5 and TSI 55 are installed on both sides of CCN2 to allow cross-connections within unit 5.
5. If unit 5 was install, verify that the circuit packs for slots TSI 15 and TSI 51 is installed on both sides of CCN2 to allow cross-connections between unit 1 and unit 5. The code of the TSI card is TM660.

Check Power Units and Fuses

Overview: Use this procedure to verify that all power units and fuses are properly installed (see Figure 2-10). Use the appropriate table from the following list to determine the required unit and fuses for the CEF or non-CEF frame.

Power Unit Summary (CEF)

Table 2-4

Power Unit Summary (Single-Bay)	Table 2-5
48-Volt Power (CEF)	Table 2-6
48-Volt Power (Single-Bay)	Table 2-7
Sync and Main Controller (CEF)	Table 2-8
Sync and Main Controller (Single-Bay)	Table 2-9
77-Type, FTU Fuses (Original Interface Bay)	Table 2-10
IFTU Fuse Assignment	Table 2-11
DSPU5 and DSPU6 Fuses (Original Interface Bay)	Table 2-12
DSPU Fuses (Flexible Bay)	Table 2-13
Power Unit Requirements	Table 2-14

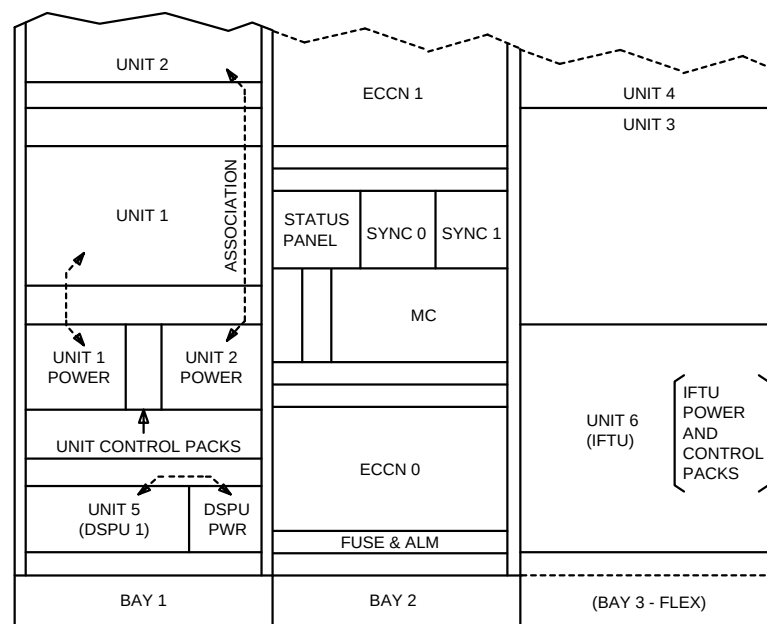


Figure 2-10. Original Interface Bay (Bay 1)

1. Locate the power unit slots for the section of the frame being equipped using shelf designation strips. Figure 2-10 shows the location of power units in an original interface bay (bay 1) for a retrofit of an existing installation.
2. Verify the required codes and quantities of power units are installed.
3. Verify the required 48-volt input fuses are installed in the fuse and alarm panel (bottom frame).
4. Verify the LED output fuses are installed in fuse boards per designation strips and appropriate tables for sync and main controller, IFTU, and units in original interface bays.

⇒ NOTE:

FTUs in original interface bays use two GRP 1 (5A) DFBs and one GRP 2 (7.5A & 5A) DFB; the GRP 2 board is for fuses CQ-JX. The DSPU uses GRP 3 (7.5A) DFBs.

5. Verify the required 48-volt fuses are installed.
6. Verify the required LED fuses are installed.
7. If any of the required responses did not occur, replace the power unit and confirm the operation of the faceplate LED.
8. Get digital multimeter (such as KS-20599 DMM) and set it to read DC "" range.
9. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN) per Table 2-14. The SPU (sync power unit) does not have test jacks to make this test.

⇒ NOTE:

The FTU power units feed a common bus, and low voltage can only be detected if one power unit is disconnected and the test is repeated for all combinations of the power units.

- If the requirement of Table 2-14 is met, disconnect the meter.
- If the requirement of Table 2-14 is not met, replace the power unit.

Table 2-4. Power Unit Summary (CEF)

Circuit Block	CP Code	Designation/ Location	Equipage
EFC	SM565 411AA	MCP /04-144 PU /04-160	One. One.
SYNC	TG58 TG58	0SPU /14-106 1SPU /14-160	One. One.
ECCN 0	—	—	The CCI and ETSI packs have built-in power converters.
ECCN 1	—	—	The CCI and ETSI packs have built-in power converters.
IFTU (Flex Bay)	411AA 411AA 411AA	PU /x06-168 PU /x14-145 PU /x14-158	All PUs for unit supply a common bus; an extra PU is always provided for backup (for example, PUs 1 & 2 required for FTM 1).
IFTU 2	424AA	PU /16-132 PU /16-144 PU /16-156	Same as IFTU.
DSPU (Flex Bay)	SM566 411AA 411AA	DCP /x04-130 1PU /x04-142 0PU /x04-150	One. One. One.
FTU1/3	411AA 411AA 411AA	PU /x28-012 PU /x28-024 PU /x28-048	All PUs for unit supply a common bus; an extra PU is always provided for backup (for example, PUs 1 & 2 required for FTM 1). Location x = 1 for units 1 & 3 and x = 3 for units 2 & 4.
FTU2/4	411AA 411AA 411AA	PU /x28-124 PU /x28-148 PU /x28-160	Same as FTU 1.
DSPU5/6	SM566 411AA 411AA	DCP5/6 /X12-130 1PU /X12-142 0PU /X12-160	One. Location x = 1 for unit 5 and x = 3 for unit 6. One. One.
DS3U5/6 HDS3U	563A 563A 563A	1 PU/11-140 for unit 6. 2 PU/11-148 3 PU/11-156	One. Location x = 1 for unit 5 and x = 3 One. One.

Table 2-5. Power Unit Summary (Single-Bay)

Circuit Block	CP Code	Designation/Location
MC	SM565	MCP/132-136
	411AA	PU/132-148
SYNC	TG58	0SPU/134-010
	TG58	1SPU/134-064
FTU1	411AA	PU/123-012
	411AA	PU/123-024
	411AA	PU/123-048
CCN0	411AA	0PU/149-078
CCN1	411AA	1PU/149-096
DSPU5	SM566	DCP5/109-130
	411AA	1PU/109-142
	411AA	0PU/109-160

Table 2-6. 48-Volt Power (CEF)

Feed A Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
A1	411A, SM566, 424AA, or 563A	Unit 1	70D,5A	Green
A2	411A, SM566, 424AA, or 563A	Unit 2	70D,5A	Green
A3	411A, SM566, 424AA, or 563A	Unit 3	70D,5A	Green
A4	411A, SM566, 424AA, or 563A	Unit 4	70D,5A	Green
A5-1	Indicator for A5-2	-	70G,0.5A	Red
A5-2	CCI,ETSIIs	ECCN 0	74J,7.5A	-
A6-1	-	-	-	-
A6-2	-	-	-	-
A7	411AA, SM566, 424AA, or 563A	Unit 5	70D,5A	Green
A8	TG58	0SPU (SYNC 0)	70D,5A	Green
A9	411AA, SM566, 424AA, or 563A	Unit 6	70D,5A	Green
A12	411AA, SM566, 424AA, or 563A	Unit 7 (0PU)	70D,5A	Green
A13	411AA, SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
A14	411AA, SM566, 424AA, or 563A	Unit 10	70D,5A	Green
A15	411AA, SM566, 424AA, or 563A	Unit 11 (0PU)	70D,5A	Green
A16	411AA, SM566, 424AA, or 563A	Unit 13 (0PU)	70D,5A	Green
A17	411AA, SM566, 424AA, or 563A	Unit 14 (0PU)	70D,5A	Green
A18	411AA, SM566, 424AA, or 563A	Unit 15	70D,5A	Green
A19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-6. Continued

Feed B Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
B1	411A, SM566, 424AA, or 563A	Unit 1	70D, 5A	Green
B2	411A, SM566, 424AA, or 563A	Unit 2	70D, 5A	Green
B3	411A, SM566, 424AA, or 563A	Unit 3	70D, 5A	Green
B4	411A, SM566, 424AA, or 563A	Unit 4	70D, 5A	Green
B5-1	-	-	-	-
B5-2	-	-	-	-
B6-1	-	-	-	-
B6-2	-	-	-	-
B7	411AA, SM566, 424AA, or 563A	Unit 5	70D, 5A	Green
B8	-	CRO	70D, 5A	Green
B9	411AA, SM566, 424AA, or 563A	Unit 6	70D, 5A	Green
B12	411AA, SM566, 424AA, or 563A	Unit 7	70D, 5A	Green
B13	411AA, SM566, 424AA, or 563A	Unit 9 (0PU)	70D, 5A	Green
B14	411AA, SM566, 424AA, or 563A	Unit 10 (0PU)	70D, 5A	Green
B15	411AA, SM566, 424AA, or 563A	Unit 11	70D, 5A	Green
B16	411AA, SM566, 424AA, or 563A	Unit 12 (0PU)	70D, 5A	Green
B17	411AA, SM566, 424AA, or 563A	Unit 14	70D, 5A	Green
B18	411AA, SM566, 424AA, or 563A	Unit 15 (0PU)	70D, 5A	Green
B19	411AA, SM566, 424AA, or 563A	Unit 16 (0PU)	70D, 5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-6. Continued

Feed C Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
C1	411A, SM566, 424AA, or 563A	Unit 1 (1PU)	70D,5A	Green
C2	411A, SM566, 424AA, or 563A	Unit 2 (1PU)	70D,5A	Green
C3	411A, SM566, 424AA, or 563A	Unit 3 (1PU)	70D,5A	Green
C4	411A, SM566, 424AA, or 563A	Unit 4 (1PU)	70D,5A	Green
C5-1	Indicator for C5-2	-	70G,0.5A	Red
C5-2	CCI,ETSIs	ECCN 1	74J,7.5A	-
C6-1	-	-	-	-
C6-2	-	-	-	-
C7	411AA, SM566, 424AA, or 563A	Unit 5	70D,5A	Green
C8	TG58	1SPU (SYNC 1)	70D,5A	Green
C9	411AA, SM566, 424AA, or 563A	Unit 6 (1PU)	70D,5A	Green
C12	411AA, SM566, 424AA, or 563A	Unit 7 (1PU)	70D,5A	Green
C13	411AA, SM566, 424AA, or 563A	Unit 8 (1PU)	70D,5A	Green
C14	411AA, SM566, 424AA, or 563A	Unit 9	70D,5A	Green
C15	411AA, SM566, 424AA, or 563A	Unit 11 (1PU)	70D,5A	Green
C16	411AA, SM566, 424AA, or 563A	Unit 12	70D,5A	Green
C17	411AA, SM566, 424AA, or 563A	Unit 13 (1PU)	70D,5A	Green
C18	411AA, SM566, 424AA, or 563A	Unit 16	70D,5A	Green
C19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-6. Continued

Feed D Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
D1	-	-	-	-
D2	-	-	-	-
D3	-	-	-	-
D4	-	-	-	-
D5-1	-	-	-	-
D5-2	-	-	-	-
D6-1	-	-	-	-
D6-2	-	-	-	-
D7	411AA,424AA, or	+5 MC Power	70D,5A	Green
D9	SM565 (MCP)	MC Power	70B,2A	Orange
D10	-	MTC	70G,0.5A	Red
D12	411AA,SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
D13	411AA,SM566, 424AA, or 563A	Unit 9 (1PU)	70D,5A	Green
D14	411AA,SM566, 424AA, or 563A	Unit 10 (1PU)	70D,5A	Green
D15	411AA,SM566, 424AA, or 563A	Unit 12 (1PU)	70D,5A	Green
D16	411AA,SM566, 424AA, or 563A	Unit 13	70D,5A	Green
D17	411AA,SM566, 424AA, or 563A	Unit 14 (1PU)	70D,5A	Green
D18	411AA,SM566, 424AA, or 563A	Unit 15 (1PU)	70D,5A	Green
D19	411AA,SM566, 424AA, or 563A	Unit 16 (1PU)	70d,5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-7. 48-Volt Power (Single-Bay)

Fuse	Power Unit	
	Type	Designation/Location
A1	411AA	FTU1-First PU
A2	TG58	0SPU (Sync Power)
A3	411AA	0PU (DSPU Side 0 Power)
A4	411AA	CCN2 Side 0 Power Unit
B1	411AA	FTU1-Second PU
B2	TG58	1SPU (Sync Power)
B3	411AA	1PU (DSPU Side 1 Power)
B4	411AA	CCN2 Side 1 Power Unit
C1	411AA	FTU1-Third PU
C2	NONE	48 Volts to TLIs 1-4, Both Sides
C3	SM566	DCP (DSPU Power)
D2	411AA	+5 Controller Power
D4	SM565	MCP (Main Controller Power)
D5	NONE	48 Volts to MTC Pack

Table 2-8. Sync and Main Controller (CEF)

Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
1SPU /14-160	0TLI2 /10-112 0TLI3 /10-120 0TLI4 /10-128 0DPLL /12-084 1TLI4 /10-136 1TLI3 /10-144 1TLI2 /10-152 1TLI1 /10-160		EBX /04-128 CPU2 /04-120 EMTC /04-112 CI /04-136 EBX /04-128 CPU2 /04-120 EMTC /04-112 CI /04-136

Table 2-9. Sync and Main Controller (Single-Bay)

Synchronizer		Main Controller	
Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
	0TLI2 /130-016		BX /132-100
	0TLI3 /130-024		CPU2 /132-108
	0TLI4 /130-032		MTC /132-120
	0DPLL /132-076		CI /132-128
	1TLI2 /130-056		BX /132-100
	1TLI3 /130-048		CPU2 /132-108
	1TLI4 /130-040		MTC /132-120
	1DPLL /132-084		CI /132-128

Table 2-10. 77-Type, FTU Fuses (Original Interface Bay)

Fuse (Note)	Associated NPCs			
	FTU 1	FTU 2	FTU 3	FTU 4
CA	1-8	161-168	321-328	481-488
CB	9-16	169-176	329-336	489-496
CC	17-24	177-184	337-344	497-504
CD	25-32	185-192	345-352	505-512
CE	33-40	193-200	353-360	513-520
CF	41-48	201-208	361-368	521-528
CG	49-56	209-216	369-376	529-536
CH	57-64	217-224	377-384	537-544
CI	65-72	225-232	385-392	545-552
CJ	73-80	233-240	393-400	553-560
CK	81-88	241-248	401-408	561-568
CL	89-96	249-256	409-416	569-576
CM	97-104	257-264	417-424	577-584
CN	105-112	265-272	425-432	585-592
CO	113-120	273-280	433-440	593-600
CP	121-128	281-288	441-448	601-608
CQ	129-136	289-296	449-456	609-616
CR	137-144	297-304	457-464	617-624
CS	145-152	305-312	465-472	625-632
CT	153-160	313-320	473-480	633-640
CU	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4
CV	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4
JW	FTMI 1-4	FTMI 1-4	FTMI 1-4	FTMI 1-4
JX	CPU, UBX	CPU, UBX	CPU, UBX	CPU, UBX

Note: The unit number that the fuses supply is identified on the fuse panel.

Table 2-11. IFTU Fuse Assignment

Fuse Boards	Designation (Note)	Associated Plug-Ins
ED-9C011-30 ED-9C011-30	+5A1 through +5A4 (1-4 through 17-20) +5A5	4 plug-ins (8 NPCs) per fuse (see +5A5 below)
ED-9C012-30 ED-9C011-30	+5A1 through +5A4 (1 through 20) +5A5, number 1 +5A5, number 2 +5A5, number 3 +5A5, number 4 +5A5, number 5	1 plug-in (2 NPCs) per fuse CPU UBX FTMI 0-Side FC 1-Side FC

Note: Designations +5A1 through +5A4 correspond to the modules (shelves) of the unit. The fuse numbers correspond to the plug-ins on the shelf (either 1 for 1 or 1 fuse per 4 plug-ins, depending on the fuse board).

Table 2-12. DSPU5 and DSPU6 Fuses (Original Interface Bay)

DSPU5		DSPU6	
Fuse or PU/ Location	Associated Circuit Pack/Location	Fuse or PU/ Location	Associated Circuit Pack/Location
(SIDE 0) 0PU/112-160 JBH/112-148	NPC641 /112-006 NPC661 /112-012 NPC681 /112-018 NPC701 /112-024	(SIDE 0) 0PU/312-160 JBH/312-148	NPC801 /312-006 NPC821 /312-012 NPC841 /312-018 NPC861 /312-024
JBG	NPC721 /112-030 NPC741 /112-036	JBG	NPC881 /312-030 NPC901 /312-036
JBF	NPC761 /112-042 NPC781 /112-048	JBF	NPC921 /312-042 NPC941 /312-048
JBE		JBE	
(SIDE 1) 1PU/112-142 JBD/112-148	NPC641 /112-074 NPC661 /112-080 NPC681 /112-086 NPC701 /112-092	(SIDE 1) 1PU/312-142 JBD/312-148	NPC801 /312-074 NPC821 /312-080 NPC841 /312-086 NPC861 /312-092
JBC	NPC721 /112-098 NPC741 /112-104 NPC761 /112-110 NPC781 /112-116	JBC	NPC881 /312-098 NPC901 /312-104 NPC921-310 NPC941 /312-116
JBB		JBB	
JBA		JBA	
DCP5 /112-130	CPU5 /112-056 DSPI5 /112-062	DCP6 /312-130	CPU6 /312-056 DSPI6 /312-062

Table 2-13. DSPU Fuses (Flexible Bay)

Fuse	Side	DSP Position (Note)
(Top) No. 1 No. 2 No. 3 No. 4	0 DSPU	(Left Panel) First and second Third and fourth Fifth and sixth Seventh and eighth
(Bottom) No. 5 No. 6 No. 7 No. 8	1 DSPU	(Right Panel) First and second Third and fourth Fifth and sixth Seventh and eighth

Note: Each fuse supplies two DSP circuit packs.

Table 2-14. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 -11.75 to -12.25	+V2 -V2	RTN RTN
411AA	+5.1 to +5.3	+	-
TG58	+4.75 to +5.25 -4.95 to -5.45	+	-
424AA	+5.0 to +5.5	+	-
485AB	+5.1 to +5.4	+	-
SM566	+4.75 to +5.25	+	-
563A	+4.9 to +5.3	5.5V	GRD

Check DSPU Circuit Pack Installation

Overview: Use this procedure to verify that all the DSPU circuit packs in the frame are properly installed.

1. Familiarize yourself with the DSPU shelf. See Figure 2-11.
2. Verify that all DSPUs are properly installed. See Table 2-15.

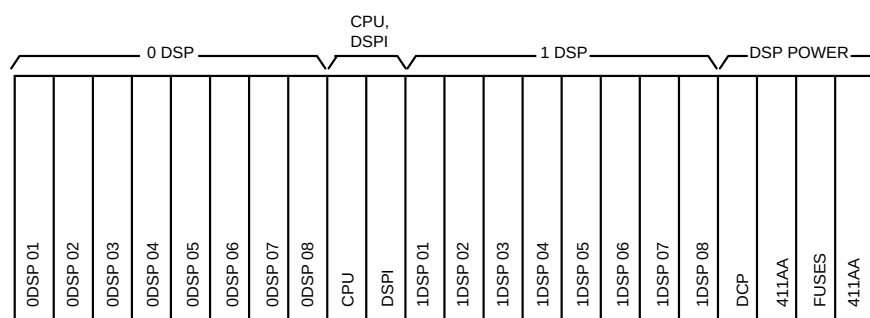


Figure 2-11. DSPU Shelf

Table 2-15. DSPU Power Units and Fuses

Fuse	Side	DSP Position (Note)
(Top) No. 1 No. 2 No. 3 No. 4	0 DSPU	(Left Panel) First and second Third and fourth Fifth and sixth Seventh and eighth
(Bottom) No. 5 No. 6 No. 7 No. 8	1 DSPU	(Right Panel) First and second Third and fourth Fifth and sixth Seventh and eighth

Note: Each fuse supplies two DSP circuit packs.

Reprovision the Frame

⇒ NOTE:

This procedure clears the current cross-connect database and has the potential to interrupt and/or terminate service if not performed properly. Therefore, contact your next level of technical support for details on how to reprovision the frame.

Review Frame and Link Setup

Overview: Use this procedure to review the frame and link configuration. This procedure is used to query the command prioritization and output message screening on administrative links. A user can only query these settings on his or her link or login. Prioritizing and screening are assigned by the frame coordinator who can query any or all user links; users can change their own output screening but not their input priority. Prioritization determines which commands are available to the user and the priority (0, 1, 2, or 3) for processing different command groups. Screening allows reducing or increasing the number of output messages that appear on the link. Unless changed, all autonomous outputs and only the output messages for inputs on the same user link appear at that link.

Check Frame, Software, and Feature Setup

1. If command has not already been entered to see the configuration, enter **UTL : [FRM xy, SEQ ww] : QRY, CNFGR!**.
2. Read the requested information using Table 2-16.
3. To see the frame ID and the version of software, enter **UTL : : QRY, WHO!**.
4. To see which features are enabled, enter **UTL : : QRY, FPKG!**.

Table 2-16. Configuration Meanings

Item	Meaning
ID xy	Frame number recorded in software
UID abc ...	Unique frame identifier
SS 0123456789	Software serial number
BAY aa	Number of bays in frame configuration
TYPE xxx-xxx	Bay type: 1 for original interface, 2 for flexible, or dash for bay 2 and unequipped
UNITS bb	Total number of units equipped
CCN c	Type of cross-connect network: 1 for CCN- multibay, non-CEF, 2 for single bay, or E for ECCN
HG d	Height of bays: 0 for 7 feet (2133 mm) 1 for 11 feet 6 inches (3505 mm) 2 for 7 feet 2.6 inches (2200 mm)
UNIT (groups of 4) (1-16 left to right)	Unit designations: 1 for FTU Version 1, 2 for DSPU, 3 for DS3U, 4 for IFTU, or dash for not designated
NPCAD (options set by ADD LINK command)	NPC addressing: E for extended, H for hierarchical, or X for 4-digit extended

Check Link Setup

1. Enter **UTL::QRY,SCR,{LINK j[mm]|USER <user id>|LINKS|USERS}!**

Where:

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link (links 5 and 6)

USER <user id> = User identification consisting of 2 to 8 alphabetical characters

USER/LINK = Selects whether user or link identification will be used in command.

2. Familiarize yourself with the following link setup options.

- To read the priority level (LEV) for different commands, relate the level — 0 (excluded group), 1 (lowest), 2, and 3 (highest), given after LEV word in the output message to the command groups per Table 2-17.
- To read the screening, find the SCR number (1 through 5) in the output corresponding to the position under the SCR category heading in the explanation line and refer to Table 2-18. For numbers 3 and 4, use Table 2-17 to determine the command groups indicated by 1s and 0s in the GR field of the output.
- The restricted maintenance option (RMON/RMOFF) determines whether the user has permission to use commands in that category.
- The link language (LANG) is given as either P (Program Documentation Standards), M (Man-Machine Language), or F (Facility Data Link Communication Protocol Language).
- The NPC addressing (NPCAD) scheme for messages is given as either E for extended (for example, 001), X for 4-digit extended (for example, 0001), or H for hierarchical (for example, 01101).
- The MCON/MCOFF option determines if macro component completion messages are output.
- The RLK option removes link privilege, output will be either RLK A (allowed) or RLK I (inhibited).

Table 2-17. Command Grouping

a (Circuit PROV)	b (EQPT PROV)	c (MTCE)	d (Test Access)	e (Monitor)	f (Common)
XCONs	GRTH	RMV	TTST	AUD	CHG
XCNTs	DGRTH	RST	STST	UTL	ED
XDISs	ADD	DGN	—	—	EXC
SW	DLT	CFR	—	—	ACT
CONF	—	—	—	—	ADD
SECH	—	—	—	—	DLT
SDCH	—	—	—	—	—
SCON	—	—	—	—	—
SCNT	—	—	—	—	—
SDIS	—	—	—	—	—

X represents cross-connect types — TCON, OCON, BCON.

Restricted Maintenance (RMON Option)

RST::SMEM,CLR!

UTL::BOOT,FRAME!

UTL::BMTR,FROM SMEM,TO PMEM[,EXCT]!

Table 2-18. Screening Options

Screening Option (n)	Definition
1	Only the responses to inputs entered on that particular link and by that user are output.
2	The responses to inputs entered on that particular link and by that user are output as well as all autonomous messages (default).
3	Responses to input messages on that particular link and by that user are output as well as responses from specified groups of action verbs from other links. The selection of message groups is made using the GR (a, b, c, d, e, f) field in the screening command.
4	Responses to input messages on that particular link and by that user, responses from specified groups of action verbs from other links (see above), and autonomous messages are output.
5	All responses to all input messages on all links are output as well as all autonomous messages.

Check Status Register

1. Enter **UTL : : QRY, STR, LINK j [mm] !** to familiarize yourself with the output.

Where:

j = Link number

mm = Synchronous link virtual.

2. Refer to Figure 2-12 to see the bit definition (meaning of 1s) of the raw data field.

ASYNCHRONOUS

M...UTL QRY STR LINK j PTCOL S 2LN MSG:
 STATUS bb e k q m p x hh COMPL

SYNCHRONOUS**PACKET LAYER FORMAT**

M...UTL QRY STR LINK j[mm]PTCOL X 4 LN MSG:
 STATUS bb e k m p hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL <X.25 PACKET LAYER parameters> <VC ranges (ppss)> <VC grps (gghh)>

LINK LAYER FORMAT

M...UTL QRY STR LINK j PTCOL X 4 LN MSG:
 STATUS bb e k m FFFF hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL T20 R20 <VC ranges> <VC groups>

 PTCOL = link protocol (Snider/X.25)

 <X.25 Link Layer Parameters>
 k T1 T3 N2

 <X.25 Packet Layer Parameters>
 T20 R20
 W P T20 T22 T23 T25 T26 R20 R22 R23 R25 (for Virtual Circuit, e.g., 501)

STATUS:

- e = 0 for true backspace or 1 for underscore backspace or dash (—) for synchronous.
link (no backspace option).
- m = 0 (idle), 1 (input message), or 2 (output message)
- bb = Baud rate (03, 06, 12, 24, 48, or 96) or 00 for synchronous link (baud not detectable)
- FFFF = For X.25 links, when a specific virtual circuit number is NOT
entered, the protocol field is 4 HEX characters (16 bits of
information), each bit representing a specific virtual circuit.
Each HEX character can contain a value from 0 - F. All zeros
indicates all 16 virtual circuits are active. All ones
indicates all 16 virtual circuits are not active.
- hh = 03 (hardware in-service) or 04 (hardware out-of-service)
- k = 1 (link alarm defined as minor) or 2 (defined as major)
- q = ENQ/ACK protocol 0 disabled, 1 enabled (default)
- x = XON/XOFF protocol 0 disabled (default), 1 enabled.
- ppss = Number of permanent and switched virtual circuits (00-16)
- gghh = Permanent and switched virtual circuit groups (00-15)

Figure 2-12. Link Status Register

Initialize and Test Alarms

Initialize Alarms

Overview: Use this procedure to verify alarms have been set up to match your frame configuration.

1. Enter **UTL:[FRM xy,SEQ ww]:INIT,ALM a!**

Where:

- xy = DACS II frame number (01 through ZZ)
- ww = Command sequence number (01 through 49)
- a = 3 for both local and remote alarm indications,
or 2 for remote alarm indications alarms.

- If the command is denied and the input message was entered correctly, refer trouble to the installer.

Test Alarm Operation

Overview: Use this procedure to test the alarm(s) operation.

1. In the first facility terminating unit (bay 1), locate the FTMI pack for one of the four modules of NPCs.
2. Disengage that FTMI pack.
3. If the **MINOR** (or **DMA MINOR** for 2.048-Mb/s line) LED is lighted on the status panel and the office alarm is operating, press the **ACO** button on the status panel.
 - If LED does not light and the alarm is operating, proceed to Step 11.
4. Push the FTMI back into the slot and enter **RST::UNIT [q]q,FTMI d!**

Where:

 - [q]q = Unit number (1 through 16)
 - d = FTMI number (1 through 4).
5. Disengage one of the DPC packs (two NPCs) in the same module.

6. If the **MAJOR** (or **PMA MAJOR** for 2.048-Mb/s line) LED is lighted on the status panel and the office alarm is operating, press the **ACO** button on the status panel.
 - If LED does not light and the alarm is operating, proceed to Step **11**.
7. Disengage two more DPCs.
8. If the **CRITICAL** (or **PMA CRITICAL** for 2.048-Mb/s line) LED is lighted on the status panel, continue with Step **9**.
 - If LED does not light and the alarm is operating, proceed to Step **11**.
9. Push the DPCs back into the slots and enter **RST : :NPC <npc No.>[-<range>]!** to restore each NPC (two per each card) to service.

Where:
<npc No.> = NPC number, either extended (for example, [0]001)
or hierarchical (for example, 01101).
<range> = Last NPC in a continuous range.
10. Verify that all the alarms clear.
 - If the alarms are clear, proceed to *Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory* to check and set the time-clock and facility report utilities.
 - If the alarms are not clear, replace the EMTC pack in the main controller as outlined in subsequent steps for the ECI.
11. If office alarm operates but LED does not light, press the **LAMP TEST** button on the status panel to determine if the LED is burned out.
 - If the LED is burned out, replace it and start again with Step **3**.
 - If the LED is not burned out, enter **RMV : :MC!** to remove the MC from service.
12. Replace the ECI pack.
13. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If the office alarm still does not operate after the reset completes, refer trouble to installation group or clear trouble in office alarm wiring.

Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory

Check and Set Time-Clock Utilities

Overview: Use this procedure to review and, if required, to set the time-clock utilities.

1. If current time needs to be set in DACS II, enter correct time using **UTL::TOD hr mn sc!**.
 - If time does not need to be set, continue with Step 2.

Where:

hr = Hour (00 through 23)

mn = Minutes (00 through 59)

sc = Seconds (00 through 59).

2. Enter correct date using **UTL::DATE {moda[ce]yr|damo[ce]yr}[,INT bb],FORMAT ggg!**

Where:

yr = Last 2 digits of year (00 through 99)

mo = Month (01 through 12)

[ce] = Century

da = Day (01 through 31)

ggg = MDY for month, day, year format or DMY for day, month, year format.

INT bb = Optional, to set period (bb=01,02,04,06,08,12, or 24 hours).

Check and Set Facility Report Utilities and Auto Backup Memory

Overview: Use this procedure to review and, if required, to set the facility report utilities. The facility report utilities are used to specify the items included in the daily report message, to set the time the daily report message will be issued, and to set up the backup memory report. (Refer to *Performance Monitoring* for detailed information regarding facility reports.)

⇒ NOTE:

To set the daily facility report time for PA type NPCs, use the **MONDAT** keyword. The time of the report (**hrmns**) can only be set to the 00, 15, 30, or 45 minute of the hour.

1. Which of the following facility parameters do you want to be included in the daily report message?
 - If **PBAs** and **Errored Seconds**, continue with Step 2.
 - If **selected parameters**, proceed to Step 3.
 - If **only PBAs** (no entry required), proceed to Step 6.

⇒ NOTE:

To see what facility reports are scheduled to occur enter
UTL : : QRY, TOD, CFA.

2. To set the time for the facility report enter **UTL : : TOD hrmns, CFA!**. Proceed to Step 6.
3. Familiarize yourself with the command (shown below) to set the time for facility report and select parameters.
UTL : : TOD hrmns, PRIM X'abcd!

Where:

PRIM X'abcd = Field to select 2.048 Mb/s facility reports; "abcd" is hexadecimal word for 16 bits that specify parameters.

4. Study hexadecimal word construction per Figures 2-13 and 2-14 for PRIM and the following examples. Whatever parameters are selected will show up in the AUD PBA command and the midnight report. Construct the hexadecimal word as follows:

- Decide which parameters are needed using Figures 2-13 and 2-14. Each parameter is represented by a digit in the hexadecimal word.
- Work with each part of the hexadecimal word (a, b, c, d) individually.
- Construct a 4-digit binary number for each part by placing a 0 in each position representing an unwanted parameter and a 1 in each position representing a wanted parameter.

Remember that the bit positions read right-to-left, low-to-high (i.e., the bit positions for b are: 11 10 9 8).

For example, to select MER and FRER, the 4-digit binary number for part b is 0011.

Repeat this step for each part.

- Convert each 4-digit binary number to a hexadecimal character using the following chart:

0000 = 0	0100 = 4	1000 = 8	1100 = C
0001 = 1	0101 = 5	1001 = 9	1101 = D
0010 = 2	0110 = 6	1010 = A	1110 = E
0011 = 3	0111 = 7	1011 = B	1111 = F

- Put the 4 hexadecimal characters together in the proper order (a b c d) to create a 4-digit hexadecimal number.

EXAMPLE: To select PBA, ERS and DM for PB/PC NPCs, the 4-digit binary numbers would be: a = 0000; b = 0000; c = 0101; d = 0001. The resulting PRIM hexword is 0051. (HEX A=1010, B=1011, C=1100, D=1101, E=1110, F=1111).

5. Enter required command for facility reporting. The selected parameters will show up in the AUD CGA command and the midnight report.

Hex Digit	Bit	Parameter
d	0	PBA
	1	LOFA
	2	SLIPS
	3	US (Unavailable Seconds)
c	4	ERS (Errored Seconds)
	5	SERS (Severely Errored Seconds)
	6	DM (Degraded Minute)
	7	CRC4
b	8	MER (Multiframe Error)
	9	FRER (Frame Bit Error)
	10	MBER (Minor Bit Error)
	11	Not Used
a	12	Not Used
	13	Not Used
	14	Not Used
	15	Not Used

Figure 2-13. PRIM Hex-Word Construction for PB/PC NPCs

Hex Digit	Bit	Parameter
d	0	PBA (Primary Block Alarm)
	1	OFS (Out-of-Frame Seconds)
	2	CSS (Controlled Slip Seconds)
	3	UAS (Unavailable Seconds)
c	4	ES (Errored Seconds)
	5	SES (Severely Errored Seconds)
	6	CV (Code Violations)
	7	CRC
b	8	MER (Multiframe Error)
	9	FRER (Frame Bit Error)
	10	BER (Minor Bit Error)
	11	UATC (Unavailable Time Count)
a	12	FUAS (Far End Unavailable Seconds)
	13	FSES (Far End Severely Errored Seconds)
	14	FES (Far End Errored Seconds)
	15	FEBE (Far End Block Error)

Figure 2-14. PRIM Hex-Word Construction for PA NPCs

Check NPC Timing Option Wiring

1. Refer to Table 2-19 to find the NPC positions in the first two modules of units 1 and 2 that can be used as sources for the 2.048-Mb/s sync clocks.



NOTE:

Only the last NPC position on each of these DPCs is used to prevent losing two sources if the DPC fails.

Table 2-19. NPC Positions

Unit	Horizontal Location	Extended Numbering		Hierarchical Numbering	
		FTM 1	FTM 2	FTM 1	FTM 2
1	130	NPC 030	NPC 070	NPC 01130	NPC 01230
1	136	NPC 032	NPC 072	NPC 01132	NPC 01232
2	130	NPC 190	NPC 230	NPC 02130	NPC 02230
2	136	NPC 192	NPC 232	NPC 02132	NPC 02232

2. Locate miscellaneous terminal strip A at the top rear of bay 2.
3. Verify that the two twisted pair leads (sync clock and ground) of these NPCs that are used go to the top-bay miscellaneous terminal strip A.
4. Verify that the 0SYNC TP and TN (ground) leads (SD-96699-01 or SD-96648-01) from those NPCs at TSA are wired to the corresponding leads at TSB going to sync port 0 of a TLI. Verify that the same is true for the 1SYNC TP and TN leads and sync port 1.

Check Sync Switchover

Overview: Use this procedure to verify that sync units have the ability to switch from the active to the inactive side and back.

1. Enter **UTL : : QRY, STATE, SYNC!** to determine the active sync side which is given by SOURCE field (inactive side will show MATE). See Table 2-20 for message field output and meanings.

Table 2-20. Sync Status Output

Message Field	Outputs and Meanings
CFR STRATUM MODE SOURCE	MASTER or SLAVED sync configuration. STR2, STR3, CEPT TOLL, or CEPT LOCAL. HOLDOVER, FAST, or NORMAL for each DPLL. Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE).
IN SERVICE-DPLL	DPLL side 0 side 1, TB side 0 side 1, SOURCE side 0 side 1; presence of a 0 for side means out-of-service and a 1 means in-service.
ACTIVE-LINK	Gives TLI No. and its SSP (0, 1) which is active on each side (0 and 1).
PLL TIMING ERROR	Presence of 0 for side means no error and presence of 1 for side means error.

2. Enter **RMV : : SYNC a!** for active side to cause switchover.
3. Obtain STATE SYNC again and check SOURCE.
4. Enter **RST : : SYNC a!** to restore SYNC side.

Check Cross-Connect Operation

Make Random Cross-Connect Tests Using A Digital Access Test Set

Overview: Use this procedure to check the operation of the cross-connect network. The cross-connect operation is checked by sending a signal through randomly chosen cross-connect circuits. The preferred method of testing the cross-connect operation uses a J1C140A Digital Access Test Set (DATS). The DATS is used in this procedure to send tone over cross-connected channels and to detect the returned tone, thereby verifying the cross-connection. To enable this test, the DATS is connected to the line interface jacks of one NPC and the other NPC named in the command is looped at the line interface jacks. These NPCs must be ones that have been grown and restored, or NPCs can be moved to various slots in equipped units and grown as TYPE PB900 or other specification type and restored to service for the test. Additional cross-connections involving different units are entered at random to ensure that the frame is operational.

1. Enter commands as follows to grow two NPCs, one which will have signal looped at line interface and one to terminal DATS:

GRTH: :NPC <npc No.>[, TYPE PB900] !

2. Verify that TG182 or TG185 plug-ins are installed in the test NPC positions.
3. Enter **RST:[FRM xy,SEQ ww]:NPC <npc No.>!** to restore the test NPCs.

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

⇒ NOTE:

The restore operation causes diagnostics to be run and places the NPC in an in-service state. The NPCs must either have the line signal connected or be looped at the line interface jacks.

4. At line interface, do Steps **5** through **8**. (See Figure 2-15.)
5. Obtain a DATS and turn the power on.
6. Connect the DATS to the first NPC to be tested (see Figure 2-15).
7. Verify that other NPC to be entered in cross-connect command has cord between IN and OUT jacks to loop the NPC signal.

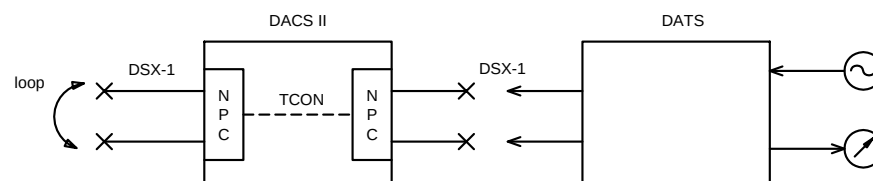


Figure 2-15. Cross-Connection Using DATS

8. Enter **TCON::FROM <npc No.1>ddd, TO <npc No.2>jjj!** at DACS II to cross-connect channel of one NPC to channel of other NPC.

Where:

- <npc No.1> = One test NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101). Channel 1 of NPC is selected for test.
- <npc No.2> = Other (different) test NPC number; channel 1 of NPC is selected.

- If tone is heard at DATS (note tone level adjustment) and completion message is received, proceed to Step 10.
- If tone is not heard at DATS, verify test connections and DATS settings.
- If the command is denied, find the reason for denial and perform corrective action to obtain completion (*Command Denials* has explanations of denial codes).

9. Remove cross-connection as follows:

TDIS::FROM <npc No.1>ddd,TO <npc No.2>jjj!

- If the command is denied, find the reason for denial and perform corrective action to obtain completion (*Command Denials* has explanations of denial codes).

10. Repeat test as necessary to include different DACS II units by moving connections to different NPCs (grown and restored). Enter the TCON command to make the cross-connection.
11. When tests are finished, remove the test connections. Remove service from and degrow any NPCs that were added for the tests. (Refer to *Test Access*.)

Make Random Cross-Connect Tests Using Unassigned Voice Terminal

Overview: Use this procedure to check the operation of the cross-connect network using an unassigned voice terminal. The cross-connect operation is checked by sending a signal through randomly chosen cross-connect circuits. These NPCs must be ones that have been grown and restored, or NPCs can be moved to various slots in equipped units and grown as TYPE PB900 or other specification type and restored to service for the test. Additional cross-connections involving different units are entered at random to ensure that the frame is operational.

1. Enter commands as follows to grow two NPCs, one which will have signal looped at line interface bay and one to an unassigned voice terminal:
GRTH: :NPC <npc No.>[, TYPE PB900]!
2. Verify that TG182 or TG185 plug-ins are installed in the test NPC positions.
3. Enter **RST:[FRM xy,SEQ ww]:NPC <npc No.>!** to restore the test NPCs.

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

⇒ NOTE:

The restore operation causes diagnostics to be run and places the NPC in an in-service state. The NPCs must either have line signal connected or be looped at the line interface jacks.

4. At line interface, do the following (see Figure 2-16):
 - Patch unassigned channel bank to one of the NPCs to be used for cross-connect tests.
 - Verify that other NPC for tests has the signal looped with looping cord between IN and OUT jacks.
5. At unassigned voice terminal, connect transmission test set to transmit signal on selected channel for test and to receive signal on same channel.

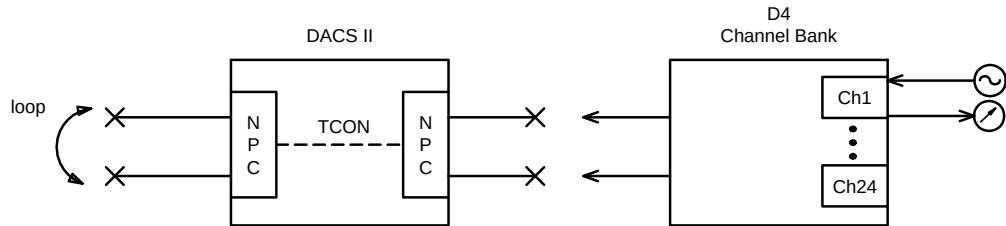


Figure 2-16. Cross-Connection Using Unassigned Voice Terminal

6. Enter **TCON::FROM <npc No.>ddd,TO <npc No.>jjj!**
at DACS II to cross-connect any channel from one test NPC to the other looped NPC.
Where:
ddd = Test channel (for example, channel 1) on first NPC for test
jjj = Test channel (for example, channel 1) on second NPC for test.
 - If tone is detected at transmission test set and a completion message is received, continue with Step 7.
 - If tone is not detected, verify test connections and signal settings on the unassigned voice terminal.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
7. To remove cross-connection, enter
TDIS::FROM <npc No.1>ddd,TO <npc No.2>jjj!
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
8. Repeat test as necessary to include different DACS II units by moving connections to different NPCs (grown and restored). Enter the TCON command to make the cross-connection.
9. When tests are finished, remove the test connections. Remove service from and degrow any NPCs that were added for the tests. (Refer to *Test Access*.)

Check for Equipped, Out-Of-Service, or Cross-Connected Circuits

Overview: Use this procedure to check for equipped circuit packs, out-of-service circuit packs, and cross-connected circuits. When acceptance is complete, there should not be any equipped Unit circuit packs.

Check for Equipped Circuit Packs

1. Enter **UTL : : QRY, EQD [, { UNIT [q]q | UNITS | ETSI | TSIS | NPCS }] !**

Where:

UNIT [q]q, UNITS, = Optional, to request the equipage
ETSI, TSIs, NPCs in specific unit or of specific
entity instead of entire frame.

See Figure 2-17 for link and CCN/ECCN circuit packs if entire frame is checked.

⇒ NOTE:

Equipped CPs are indicated by a "1" alongside the CP or by the CP number in the sequence. For duplicated entities (FC, ETSIs/TSIs), there will be listings for both the zero and one sides for each duplicated circuit packs.

M...UTL QRY <parameter> g h i j k l m n o p EOM

g = Link 1
h = Link 2
i = Link 3
j = Link 4
k = Link 5
l = Link 6
m = Cross-Connect Side 0
n = Cross-Connect Side 1
o = CCI 0 / CCNI 0
p = CCI 1 / CCNI 1

Figure 2-17. Common Equipment Readout

Check for Out-of-Service Circuit Packs

2. Check for out-of-service circuit packs by entering
UTL::QRY,OOS[,UNIT [q][q]q]!

Where: [q]q = Unit number (1 through 16).

⇒ NOTE:

Enter OOS if you do not expect any out of service circuits during acceptance. However, ALL is used most frequently to show all (OOS, FAIL,PEST) conditions. If XON was used when the link was provisioned, CTRL-s or CTRL-q can be used to temporarily stop or start long output messages.

⇒ NOTE:

The conditions are indicated by the presence of a "1" after the entity in the printout. For duplicated entities (FC, CCN/ECCN), there will be listings for both the zero and one sides for the duplicated plug-in. Unequipped NPCs are indicated by dashes.

3. If any circuit packs are equipped but out-of-service, enter:
 - the RST (restore) command for the pack if it should be in-service, or
 - the DGRTH (degrow) command for the pack if acceptance testing is complete.

Refer to Figure 2-18.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSYS,ECCN s,ALL!	For all ETSIs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 2-18. Maintenance Command Construction

Check for Cross-Connect Circuits

4. If you need information on what cross-connect circuits are up on the frame, continue with Step 5.
 - If you do not need information on what cross-connect circuits are up on the frame, proceed to Step 6.
5. Use the following commands as needed to see any cross-connections:
 - **UTL : : QRY, CMAP <npc No.>[-<range>]!** shows the connections on a single NPC or range of NPCs.

Where: <range> = Optional, last NPC of a continuous range.

- **UTL : : QRY, DMAP!** gives a long listing of connections on all NPCs. To abort listing while in progress, enter CTRL x and carriage return to gain access to the link; then enter ABT. If XON was used when the link was provisioned, CTRL-s or CTRL-q can be used to temporarily stop or start long output messages.

⇒ NOTE:

If any cross-connections remain, remove any test connections and remove service from and degrow any NPCs that were added for the cross-connections.

6. When acceptance is complete, there should not be any equipped Unit circuit packs. If all procedures in this chapter have been successfully completed, acceptance testing is completed.

Provisioning

3

Frame

Before performing any provisioning procedure, familiarize yourself with the method of installing circuit packs as follows:

- Unpack the circuit packs at the frame location where they will be used.
- Use the wrist strap and observe ESD (electrostatic discharge) precautions when handling the pack.
- While holding the plug-in by the front piece, bring it up and place it into the slot. Also support the bottom edge if necessary.
- Gently push the card in the slot to the point where the top and bottom latches can be used to pull the card evenly into the slot.

Configure Frame

Overview: This procedure deals with the menu driven CFR FRAME routine used to enter bay configuration information into the data base. The frame number and unique frame ID can be protected against change using this procedure, or existing protected numbers can be changed using this routine. The bay assignments are made by specifying the HT (height), the type of bay (original or flexible), the cross-connect network designation, and the unit types [IFTU2 (integrated facility terminating unit 2), DSPU (digital signal processing unit), DS3U (DS3 unit), HDS3U (Hybrid DS3 unit), NONE] in each bay. Separate growth commands must still be entered to equip units. The unit designations in the configuration define the use of the units and establish the location of circuit packs.

⇒ **NOTE:**

A timeout can occur if entries are delayed during any part of the session; so you may want to read through the procedure first to help prevent a timeout and the need to reenter the information.

⇒ **NOTE:**

The configure session is started from the Main Menu and is concluded from the Main Menu, but you can abort the session and return to this menu (all entries discarded) by entering CTRL D and carriage return.

1. Log in on link 1 as user DAX (refer to Administration).

⇒ **NOTE:**

Configuring the frame must be performed by user DAX on link 1, any attempt to configure the frame by any other user or on any other link will be denied.

2. If you are using the configure routine to expand the CEF bay configuration beyond three bays, enter **UTL::QRY,SCR,{LINKS|USERS}!** to verify that all users and in-service links have the NPCAD (network processing circuit addressing) option set for either 4-digit extended (X) or hierarchical (H).

⇒ **NOTE:**

If any users or links are provisioned with NPCAD = E, enter **ADD::NPCAD H,ALL!** to temporarily change all users and links to the hierarchical addressing scheme.

3. Enter **UTL : :BMTR, FROM RAM, TO MEM!** to ensure that any recent frame activities are recorded on the primary memory card.
4. At link 1, enter **RST : :MC, MCOND!** to place the frame in the maintenance condition which limits the frame activity to maintenance commands.
5. To initiate the routine, enter **CFR : :FRAME!**.
6. Notice the Main Menu selections and consider the following:
 - The initialize/reset configuration file includes the entries for the software serial number, protected frame numbers, the number of bays in the frame, the height of the bays, the allowable non-hierarchical NPCAD scheme, and the types of units to be equipped. These entries must be made and the configuration must be initialized in the data base before any of the other options on the menu can be performed.
 - The add new bay(s) and unit(s) option will be denied if all bays have already been configured.
 - The add unit(s) to existing bay(s) will be denied if no units were previously designated as unit type NONE.
 - The change unit(s) type will be denied if selected unit(s) have already been grown via commands.
 - The remove unit(s) or bay(s) and unit(s) option will be denied if all units were previously designated as NONE or if selected unit(s) have already been grown via commands.
 - The recall option displays what has been entered or what currently exists in the data base configuration.
 - The exit option executes the configure command and records what was entered on the primary memory card.
7. Consider the following items that have to do with making selections within any of the Main Menu routines:
 - To make a selection from a submenu listing, enter the item number for the selection and enter RETURN. To select the default item, simply enter RETURN.
 - If entered information is incompatible with the rest of the configuration, an error explanation will appear and the previous question will be displayed again.

8. Select the Main Menu item followed by RETURN for the part of the configure routine you want to do.
 - If initialize/reset was selected, continue with Step 9.
 - If initialize/reset was not selected, proceed through the session making the choices to all submenus and after all parts have been completed, proceed to Step 17.
9. If you do not want to enter a unique software serial number, simply press RETURN. This is how existing or default values are maintained; the system responds with OK, NO CHANGE, or DEFAULT ACCEPTED.

⇒ NOTE:

The software serial number identifies the frame so that the data bases transferred to SMEM are restricted for use in that frame.

10. If a unique software serial number is to be entered or the number is to be changed to accommodate a memory card from another frame, enter the number and RETURN.
11. Enter information on bay height, the CCN (cross-connect network) type (type is fixed as ECCN), and the option for the number of digits needed for extended NPC numbering.

⇒ NOTE:

Four digits will be needed for extended NPC (network processing circuit) numbers starting in unit 7 (NPC 1000). The 3- or 4-digit option only applies when there are three bays or less.

⇒ NOTE:

Even if hierarchical numbering is to be used, the extended NPC option must be selected correctly in order to continue without an error message. An error message will also occur if the selected option conflicts with what was previously entered by the ADD USER/LINK command.

12. Answer the question about the number of bays and answer the question about bay 1.

**NOTE:**

An original interface bay has a fixed assignment of units (units 5 and 6 can only be DSPU or DS3U types), and the flexible interface bay allows varied assignment of unit types.

**NOTE:**

Original interface bays will only be found in bays 1 and 3 of an older non-CEF frame, and only when the frame is a retrofit installation.

13. Continue with the questions to number all the bays in the frame.

**NOTE:**

The bay numbering portion of the initialize/reset option commences with the lowest numbered bay which has not already been entered.

**NOTE:**

The default order of numbering the bays is in consecutive order, but you can make selections to configure the bays in a different order.

14. Continue with the questions to select the unit types in the bays. The possible unit types are IFTU2, DSPU, DS3U, or NONE; Please note the HDS3U is initially selected as a DS3U. The unit must first be configured as a DS3U and becomes an HDS3U once it is grown as an HDS3U with the type field HT100. An HDS3U should only be grown with hybrid formatters, a protection hybrid multiplexer, the FLI packs, and the UC physically in place.
15. When asked whether the frame number and unique identifier are to be unprotected, answer accordingly. If they are not to be protected, which means they can be subsequently changed using GRTH FRAME, answer YES and enter the numbers when requested. Otherwise, answer NO.
16. After you have completed the menu portion, examine the configuration that is displayed. If not displayed, enter the recall configuration data.
 - To keep the entries and go to the Main Menu to exit, enter RETURN.
 - To discard the entries, enter CTRL D and return.
17. When back at the Main Menu, either select another menu item to make changes or select Exit to incorporate the entries in the data base and update the primary memory card.

18. If CFR COMPL message is received, enter **RST : :MC!** to exit the MCOND state. (See Note 1.) The procedure to configure the frame has been completed.

- If denial message is received, continue with Step 19.

⇒ **NOTE 1:**

When you exit, there will be a delay before getting the completion message.

⇒ **NOTE 2:**

The user can now re-establish specific users and links to the 4 digit extended addressing scheme by entering the following command
ADD : :{LINK j[mm]}|USER <user id>,NPCAD X!.

19. Which denial explanation is received?

- If **COND 8D or 92**, proceed to Step 21.
- If **COND 8F**, proceed to Step 22.
- If **COND 97**, continue with Step 20.
- If **COND 98**, proceed to Step 23.

20. The configuration routine was aborted before the entire routine was completed. Enter **UTL : :QRY,CNFR!**.

- If pertinent information was not included, repeat the procedure from Step 5.
- If pertinent information has been entered, enter **RST : :MC!** to exit the MCOND state. The procedure to configure the frame has been completed.

21. Enter **RST : :PMEM!** to clear the buffers and ensure that the primary memory card is powered.

- If you are now able to repeat the configure frame routine and write to PMEM, enter **RST : :MC!** to exit the MCOND state. The procedure to configure the frame has been completed.
- If trouble persists, continue with Step 22.

22. Enter **DGN : :PMEM!**.
 - If DGN ...STF message is received, refer to *Manual Diagnostic Failures* in Volume II.
 - If message was not received and trouble persists, do not continue with this procedure. Contact a technical consultant.
23. At the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND) is received, repeat the procedure to configure the frame.
 - If RESET ...COMPL (with COND) is received, refer to *Data Base Troubles* in Volume II to clear reset trouble.

Grow Frame ID

Overview: This frame growth command: (1) places a nonzero frame number and optional unique identifier into the data base, (2) enables the use of a 3-character frame field (if developed), and (3) grows virtual NPCs [9]961 (and others) as TYPE VI100 for network broadcast connections. If the frame number and any UID (unique identifier) were protected against change using the CFR FRAME routine, these numbers are fixed, and the same numbers must be entered in the command. If the frame numbers were not protected, different frame and UID numbers can be entered in this procedure. The UID allows distinguishing the frame from others having the same unique frame ID; frequently, the COMMON LANGUAGE* code is used as the identifier.

1. Enter the frame growth command as follows:

GRTH: :FRAME fg[,CHAR n][,UID abc123...]!

Where:

abc123... = Unique Frame ID (UID); up to 20 alphanumeric characters.

fg = Two-digit, alphanumeric frame number (00 through ZZ).

n = Optional, 3 for 3-character frame field in command (n = 2 is default).

- If command COMPL message is received, the procedure to grow the frame ID has been completed.
- If GRTH ...COND 81 DNY message is received, you must grow the frame with the same numbers contained in the software configuration file; the numbers can only be changed using the **CFR: :FRAME!** command per *Configure Frame*.
- If other denial code is received, find the explanation for the denial in *Command Denials*.

* COMMON LANGUAGE is a registered trademark and CLEI, CLLI, CLCI, and CLFI are trademarks of Bell Communications Research, Inc.

Synchronizers

Install Synchronizer Circuit Packs

⇒ NOTE:

The only way to switch SYNC sides is to issue a RMV::SYNC command followed by a RST::SYNC command. When the SYNC switches sides, the (E)CCN also switches. Switching SYNC sides is not necessary for normal operation.

1. Familiarize yourself with the layout of the equipment in the frame. The sync is always mounted with the main controller in bay 2 (switch bay) in an original interface frame. Figure 3-1 shows the location in the CEF (capacity expansion frame).

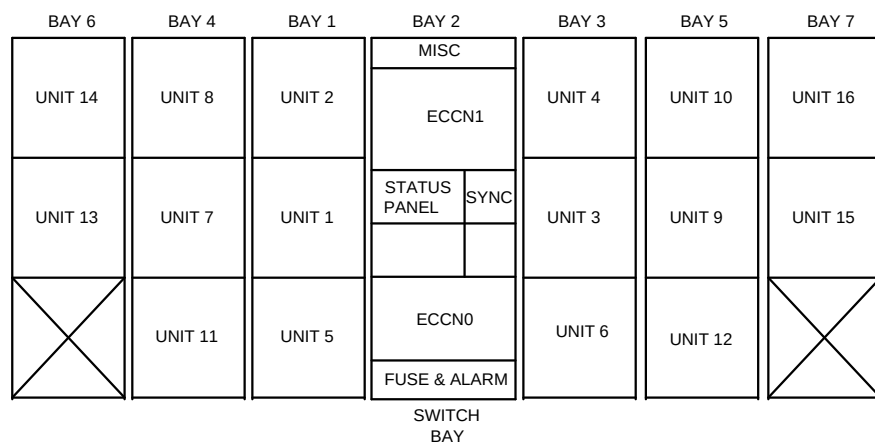


Figure 3-1. Fully-Equipped CEF

2. From system layout information and installation records, determine the following on the sync:
 - The configuration, MASTER or SLAVED.
 - The number and types (digital line, office clock, etc.) of incoming links for slaved timing.

— Timing distribution, whether DACS II supplies timing to other equipment in the office.

3. Check and install the TB (time base) using the TB portion of Table 3-1.
4. Install the OSPU and SPU (synchronizer power unit) (TG58).
5. Check and install TLI (timing link interface) type designations per TLI part of Table 3-1.
6. Verify that there are duplicate TLI cards (on sides 0 and 1) for each incoming and timing distribution link. See Table 3-1 for equipment codes.
7. If TG68 or TG75 TLIs are used, verify that the packs are installed in the TLI 2 positions of the sync; four inputs for coaxial cable are provided at the top of the frame.
8. If timing signals are to be distributed from the DACS II, verify that the correct code of TLI is installed and check connection of timing cables. Both the TG70 and TG71 packs provide 4 multiplied outputs.

**NOTE:**

Unused ports do not need terminations.

Table 3-1. Sync Circuit Pack Cards

Circuit Pack	Code	Growth Type	Description
TB	TG60	TB000	TBS3 (Time Base, Stratum 3) — Domestic Use
	TG61	TB100	TBCL (Time Base, CEPT Local Office)
	TG62	TB200	TBCT (Time Base, CEPT Toll Office)
	TG63	TB300	TBS2 (Time Base, Stratum 2) — Domestic Use
TLI	TG64	TExyz	TXB1 (DS1 Timing Extractor)
	TG65	TPxyz	TXB2 (2.048-Mb/s Primary Block Timing Extractor)
	TG66	TCxyz	TXCC (64 kb/s Composite Clock Timing Extractor)
	TG67	TUxyz	TXUC (Unipolar Clock Timing Extractor)
	TG68	TRxyz	TXRS (BSRF [Reference Frequency] Timing Extractor)
	TG70	TD1yz	TDCC (64 kb/s Composite Clock Timing Distributor)
	TG71	TD2yz	TDS2 (2.048-Mb/s Sine Wave Timing Distributor)
	TG75	TPxyz	TXBT (Primary Block Extractor, 75-Ohm)

Check NPC Timing Option Wiring

Use this procedure to check the NPC timing option wiring.

1. Refer to the following lists to find the NPC positions in the first two modules of units 1 and 2 that can be used as sources for the 2.048-Mb/s sync clocks.

Hierarchical numbering	Extended numbering
01130	030
01132	032
01230	070
01232	072
02130	190
02132	192
02230	230
02232	232



NOTE:

Only the last NPC position on each of these DPCs is used to prevent losing two sources if the DPC fails.

2. Locate miscellaneous terminal strip A at the top rear of bay 2.
3. Verify that the two twisted pair leads (sync clock and ground) of the NPCs that are used go to the top-bay miscellaneous terminal strip A.
4. Verify that the 0SYNC TP and TN (ground) leads (SD-96699-01 or SD-96648-01) from those NPCs at TSA are wired to the corresponding leads at TSB going to sync port 0 of a TLI. Verify that the same is true for the 1SYNC TP and TN leads and sync port 1.

Grow Sync Timebase, Configure Sync Mode, and Restore Sync

⇒ NOTE:

Since one TLI must be grown for timing distribution in the MASTER Sync Mode; it is covered in this procedure.

Additional TLIs are grown in *Grow and Restore Sync TLIs*.

1. Enter **GRTH::SYNC,TB,TYPE TBpqr!** to grow the sync time base.

Where: pqr = 000 for North American Stratum 3
 100 for CEPT, local office
 200 for CEPT, toll office
 300 for North American Stratum 2.

2. Verify that circuit pack cards for the TBs and TLIs are installed to enable restoring sync and to enable hardware matchup when TLIs are grown. Always wait 30 minutes for TB oven to reach temperature before attempting to restore sync to service. The TG68 and TG75 cards can only be installed in TLI 2 position because of the 75-ohm coaxial connections.
3. Which sync configuration is required?
 - If **MASTER**, continue with Step 4.
 - If **SLAVED**, proceed to Step 10.
4. Enter **CFR::SYNC,MASTER!**.
5. Enter **RST::SYNC 0!** and then **RST::SYNC 1!**.
6. Enter **GRTH::SYNC,TLI 1,TYPE TDpqr!** to grow TLI 1 for timing distribution.

Where: pqr = Format specification; 100 for composite clock (TG70 pack) or 200 for sine wave 2.048 MHz (TG71 pack).

7. Verify TB circuit pack is installed in TLI-3 side 1 position before entering **GRTH::SYNC,TLI 3,TYPE TBpqr!** to grow additional TB (same stratum as others) for use as clock reference oscillator.
8. Enter **RST::SYNC 0,TLI 1!** and **RST::SYNC 1,TLI 1!** to restore TLI 1 on both sides.
9. Wait 30 minutes for the timebase to warm up then enter, **RST::SYNC,TLI 3,CRO!** to restore TLI 3.
 The procedure to configure the sync for MASTER mode has been completed.
10. Enter **CFR::SYNC,SLAVED!**.

11. Enter **RST::SYNC 0!** and then **RST::SYNC 1!**.

Grow and Restore Sync TLIs

Use this procedure to grow and restore the sync TLIs.

1. How will the TLI pack be used?
 - If **TIMING EXTRACTOR**, continue with Step 2.
 - If **TIMING DISTRIBUTOR**, proceed to Step 7.
2. Note the following comments about the command fields:
 - The sync ports (SSP 0 and SSP 1) on each TLI are grown separately; the type (TP versus TU) must be the same, but the parameters may be different.
 - The source priority for the two SSPs on a TLI must be different.
 - The optional NPC field is used when an NPC is used as a timing source for the TLI. In this case, the TLI is a TU type and the unipolar signal is wired through the miscellaneous terminal strip on the frame.
3. To grow SSP 0 for the TLI, enter
GRTH::SYNC, TLI n, TYPE texyz, SSP a, SRC p[, NPC <npc No.>]!
 Where: n = TLI number (1 through 4)
 te = TP for code TG65 or TG75 cards; TC for code TG66 card; TU for code TG67 card; or TR for code TG68 card
 xyz = Signal format specification; for TP, see Table 3-2; for TE, see Table 3-3; for the TC, TU, and TR timing extractors, xyz can be any value (000 to 999).
 a = Sync port (0 or 1)
 p = Priority for sync port, p=1 (highest) to p=8 (lowest)
 <npc No.> = Optional, to name NPC supplying timing from incoming line; This field only appropriate with TLI type TU.
4. To restore the same SSP on both sides, enter
RST::SYNC 0, TLI n, SSP 0! and then **RST::SYNC 1, TLI n, SSP 0!**.
5. Repeat Steps 3 and 4 to grow SSP 1 and restore it on both sides (substitute SSP 1 for SSP 0 in commands).
6. Repeat Steps 3, 4, and 5 as required to grow and restore remaining timing extractor TLIs. The procedure to provision TLIs has been completed. If additional TDs (timing distributors) are needed, continue with Step 7.

Table 3-2. TLI Type Growth Options

Option x	Frame Format
1 or 5	Common Channel Signaling
2 or 6	Channel Associated Signaling - Mode 0
3 or 7	Channel Associated Signaling - Mode 1
4 or 8	European Remote Switching Module (ERSM)
0 or 9	Invalid
Option y	Line Format
0 or 2	Alternate Mark Inversion
1 or 3	High Density Bipolar of Order 3 (HDB3)
4 or 9	Invalid
Option z	Channel Format
0 through 9	Unassigned

Table 3-3. TE-Type Growth Options

TE-Type TLI xyz Fields	
Option x	Frame Format
0	Invalid
1	D4 Format
2, 3	ESF Format
4	DDS (T1DM) Format
5-9	Invalid
Option y	Line Format
0, 1	Bipolar Line Coding
2	B8ZS Line Coding
3	Invalid
4, 5	Bipolar Line Coding
6	B8ZS Line Coding
7-9	Invalid
Option z	Channel Format
0 through 9	Unassigned

7. Enter **GRTH::SYNC, TLI n, TYPE TDpqr !**

Where:

n = TLI number (1, 3 or 4)

pqr = Signal format specification;
 100 for composite clock (TG70 pack)
 200 for sine wave (TG71 pack).

8. Enter **RST::SYNC 0, TLI n!** and then **RST::SYNC 1, TLI n!** to restore the TLI on both sides.
9. Repeat Steps 7 and 8 as needed to grow and restore other timing distributor TLIs.
10. Enter **UTL::QRY, ALL, COMMON!** to check the source priority.
11. Enter **UTL::QRY, STATE, SYNC!** and notice the status of the new links as shown in the message.

⇒ NOTE:

Sync 0 occurs before (left of) sync 1 in the status listings and the presence of a 1 alongside a condition indicates that the condition exists.

Query Sync Status

1. Read the query output using Table 3-4 for the TLI types and read the following:
 - The TB types are TB000 for domestic-stratum 3, TB100 for CEPT - local office, TB200 for CEPT - toll office, and TB300 for domestic-stratum 2.
 - The TLI types are given by the letter codes, and the signal formats are given by the associated number codes (xyz) which for TP type is the same as for NPC growth (see Table 3-5).
 - The SRC is the priority of TLI sources (from the highest 1 to the lowest 8).
2. Enter **UTL::QRY, STATE, SYNC!** and read the sync configuration and status using Table 3-6.
3. Enter **UTL::QRY, STR, SYNC a!** and read the output.
 Where: a = Sync side (0 or 1) to get the equivalent information.
 Crosscouple is the normal running mode in which the sync sides are locked together (in-phase).

4. If the sync configuration = MASTER, verify that additional TB circuit pack is installed in TLI 3, side 1 slot. This time base pack will also take up TLI 4 position. Timing distributor packs must also be installed in duplicated TLI 1 or TLI 2 slots for this application. See Figure 3-3 and Table 3-4 for equipment codes.

Table 3-4. Sync Circuit Pack Cards

Circuit Pack	Code	Growth Type	Description
TB	TG60	TB000	TBS3 (Time Base, Stratum 3) — Domestic Use
	TG61	TB100	TBCL (Time Base, CEPT Local Office)
	TG62	TB200	TBCT (Time Base, CEPT Toll Office)
	TG63	TB300	TBS2 (Time Base, Stratum 2) — Domestic Use
TLI	TG64	TExyz	TXB1 (DS1 Timing Extractor)
	TG65	TPxyz	TXB2 (2.048-Mb/s Primary Block Timing Extractor)
	TG66	TCxyz	TXCC (64 kb/s Composite Clock Timing Extractor)
	TG67	TUxyz	TXUC (Unipolar Clock Timing Extractor)
	TG68	TRxyz	TXRS (BSRF [Reference Frequency] Timing Extractor)
	TG70	TD1yz	TDCC (64 kb/s Composite Clock Timing Distributor)
	TG71	TD2yz	TDS2 (2.048-Mb/s Sine Wave Timing Distributor)
	TG75	TPxyz	TXBT (Primary Block Extractor, 75-Ohm)

Table 3-5. Growth Options**TP (Primary Block Timing Extractor)**

Option x	Frame Format
1 or 5	Common Channel Signaling
2 or 6	Channel Associated Signaling - Mode 0
3 or 7	Channel Associated Signaling - Mode 1
4 or 8	European Remote Switching Module (ERSM)
0 or 9	Invalid
Option y	Line Format
0 or 2	Alternate Mark Inversion
1 or 3	High Density Bipolar of Order 3 (HDB3)
4 or 9	Invalid
Option z	Channel Format
0 through 9	Unassigned

Table 3-6. Sync Status Output

Message Field	Outputs and Meanings
CFR STRATUM MODE SOURCE	MASTER or SLAVED sync configuration. STR2, STR3, CEPT TOLL, or CEPT LOCAL. HOLDOVER, FAST, or NORMAL for each DPLL. Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE).
IN SERVICE-DPLL	DPLL side 0 side 1, TB side 0 side 1, SOURCE side 0 side 1; presence of a 0 for side means out-of-service and a 1 means in-service.
ACTIVE-LINK	Gives TLI No. and its SSP (0, 1) which is active on each side (0 and 1).
PLL TIMING ERROR	Presence of 0 for side means no error and presence of 1 for side means error.

M...UTL QRY STR SYNC a
 byte1, byte2, byte3, byte4, byte5, byte6
 byte7, byte8, byte9, byte10, byte11, byte12 COMPL

BYTE 1 (BITS abcdefgh)

a = spare	e = TLI 1 in service
b = sync hardware failed	f = TLI 2 in service
c = mate failed or OOS	g = TLI 3 in service
d = TB failed or OOS	h = TLI 4 in service

BYTE 3 (BITS abcdefgh)

a = sync reset, needs config.	e = crosscouple trouble
b = DPLL hardware error	f = CRO timing trouble
c = TB error	g = spare
d = PLL symmetry error	h = spare

BYTE 5 BIT POSITIONS: ab cde fgh

SOURCE (BITS ab)	ACTIVE PORT (BITS cde) (if BITS ab = 01)
00 = holdover	000 = TLI 1, SSP 0
01 = timing link	001 = TLI 1, SSP 1
10 = cross-couple	010 = TLI 2, SSP 0
11 = CRO	011 = TLI 2, SSP 1
	100 = TLI 3, SSP 0
	101 = TLI 3, SSP 1
	110 = TLI 4, SSP 0
	111 = TLI 4, SSP 1
BITS fgh (unused)	

BYTE 9 (BITS abcdefgh)

a = loss of energy	d = TB oven still cold
b = TB command error	e = spare
c = TB oscillator drift (master mode)	fgh = 000 for stratum 3, 001 for 2-Mb/s local 010 for 2-Mb/s toll, 011 for stratum 2

Figure 3-2. Sync Status Register

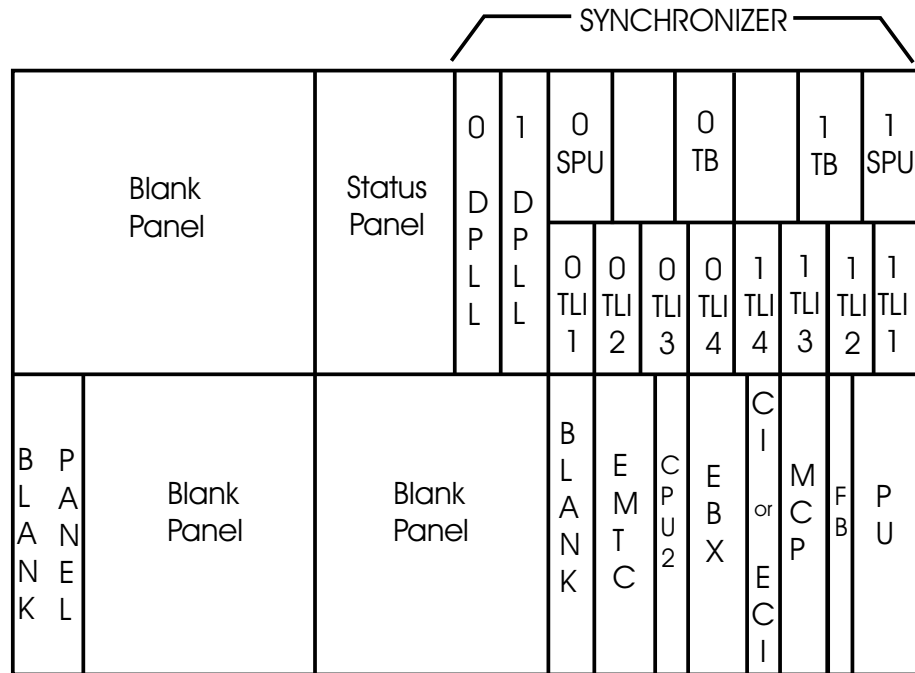


Figure 3-3. Identification of Main Controller Slots in CEF

Add/Change Synchronizer Timing Link Interface

Overview: This procedure allows: (1) connecting additional TLIs (timing link interfaces) for timing extraction or (2) changing the existing TLI types, NPC source, or sync port priority. Any NPC timing sources are entered in the data base in this procedure. Additional links may be used to provide extra protection in case the other links fail or to provide different priority source signals. Each TLI has two sync ports (SSP) and is duplicated on both sides of the sync. If an active SSP fails, the sync will switch to the other SSP on the TLI; if there are no more sources on the side, the sync will switch to the other side.



CAUTION:

Performing this procedure incorrectly can interrupt service. Perform each step of the procedure in the order given.

1. If office timing source is to be connected to DACS II, verify that timing signals have been wired to miscellaneous terminal strip on DACS II frame. Each DACS II sync TLI circuit pack has two ports.
2. Verify that correct code(s) of timing extractor packs were installed for the additional timing links per Table 3-7. The same code must be installed in the corresponding TLI slots of both syncs. The TG68 and TG75 packs can only be installed in the TLI 2 position because of the 75-ohm coaxial connections.
3. If timing for added link is to be extracted from 2.048 Mb/s line, the involved NPC must be named in the data base so that sync failures will be related to NPC source failures. Only one of the eight allowable NPCs can be used per TLI SSP. These NPCs are the last NPCs on the designated cards in units 1 and 2 as follows:
Hierarchical numbering
01130, 01132, 01230, 01232, 02130, 02132, 02230, and 02232.
Extended numbering
030, 032, 070, 072, 190, 192, 230, and 232
4. Do you need to add timing links or change existing TLIs?
 - If **add links**, continue with Step 5.
 - If **change TLIs**, proceed to Step 12.

5. To grow SSP 0 on the next TLI, enter
GRTH::SYNC, TLI n, TYPE tepqr, SSP a, SRC p[, NPC <npc No.>]!
 Where:
 n = TLI number (1 through 4).
 tepqr = Input signal type (TP, TC, TU, TR per Table 3-7)
 and format; for type TP, see Table 3-8,
 for others listed, pqr is not defined (000 through 999).
 a = Sync port 0 or 1.
 p = Sets the priority, p=1 (highest) to p=8 (lowest).
 <npc No.> = Optional, to name NPC supplying timing from incoming line;
 either extended (for example, [0]030) or hierarchical
 (for example, 01130). Only appropriate with TLI type TU.
6. To restore sync port 0 in the TLIs in both syncs, enter
RST::SYNC 0, TLI n, SSP 0! and **RST::SYNC 1, TLI n, SSP 0!**.
7. Repeat Step 5 to grow the other sync port (substituting SSP 1) on the same TLI.
8. Repeat Step 6 (substituting SSP 1) to restore sync port 1 on the same TLIs and in both syncs.
9. If more TLIs are to be added at this time, repeat Steps 5 through 8 for the next TLI.
 - If no more TLIs are to be added, continue with Step 10.

Table 3-7. Sync Circuit Pack Cards

Circuit Pack	Code	Growth Type	Description
TB	TG60	TB000	TBS3 (Time Base, Stratum 3) — Domestic Use
	TG61	TB100	TBCL (Time Base, CEPT Local Office)
	TG62	TB200	TBCT (Time Base, CEPT Toll Office)
	TG63	TB300	TBS2 (Time Base, Stratum 2) — Domestic Use
TLI	TG64	TExyz	TXB1 (DS1 Timing Extractor)
	TG65	TPxyz	TXB2 (2.048-Mb/s Primary Block Timing Extractor)
	TG66	TCxyz	TXCC (64 kb/s Composite Clock Timing Extractor)
	TG67	TUxyz	TXUC (Unipolar Clock Timing Extractor)
	TG68	TRxyz	TXRS (BSRF [Reference Frequency] Timing Extractor)
	TG70	TD1yz	TDCC (64 kb/s Composite Clock Timing Distributor)
	TG71	TD2yz	TDS2 (2.048-Mb/s Sine Wave Timing Distributor)
	TG75	TPxyz	TXBT (Primary Block Extractor, 75-Ohm)

Table 3-8. Growth Options

TP (Primary Block Timing Extractor)	
Option x	Frame Format
1 or 5	Common Channel Signaling
2 or 6	Channel Associated Signaling - Mode 0
3 or 7	Channel Associated Signaling - Mode 1
4 or 8	European Remote Switching Module (ERSM)
0 or 9	Invalid
Option y	Line Format
0 or 2	Alternate Mark Inversion
1 or 3	High Density Bipolar of Order 3 (HDB3)
4 or 9	Invalid
Option z	Channel Format
0 through 9	Unassigned

10. Enter **UTL::QRY,STATE,SYNC!** and notice the status of the new links as shown in the message (see Table 3-9).

⇒ NOTE:

Sync 0 occurs before (left of) sync 1 in the status listings and the presence of a 1 alongside a condition indicates that the condition exists.

11. For additional sync information, enter the appropriate command and read the registers:
- For SYNC: **UTL::QRY,STR,SYNC a!** (Figure 3-4).
 - For TLI: **UTL::QRY,STR,SYNC a,TLI n!** (Figure 3-5).
 - For SSP: **UTL::QRY,STR,SYNC a,TLI n,SSP s!** (Figure 3-6).

The procedure to add the synchronizer timing link interface has been completed.

12. Enter the UTL QRY commands given in Steps **10** and **11** to check the existing status and characteristics of the TLIs to be changed.
13. To remove sync port 0 on the subject TLI in both syncs, enter **RMV::SYNC 0,TLI n,SSP 0!** and **RMV::SYNC 1,TLI n,SSP 0!**.

Table 3-9. Sync Status Output

Message Field	Outputs and Meanings
CFR STRATUM MODE SOURCE	MASTER or SLAVED sync configuration. STR2, STR3, CEPT TOLL, or CEPT LOCAL. HOLDOVER, FAST, or NORMAL for each DPLL. Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE).
IN SERVICE-DPLL	DPLL side 0 side 1, TB side 0 side 1, SOURCE side 0 side 1; presence of a 0 for side means out-of-service and a 1 means in-service.
ACTIVE-LINK	Gives TLI No. and its SSP (0, 1) which is active on each side (0 and 1).
PLL TIMING ERROR	Presence of 0 for side means no error and presence of 1 for side means error.

14. Repeat Step **13** (substituting SSP 1) to remove sync port 1 on the same TLIs in both syncs.
15. Which change do you need to make?
 - If **TLI type** or **NPC source**, continue with Step **16**.
 - If **sync port priority**, proceed to Step **17**.
16. Enter **CHG::SYNC, TLI n, SSP a, {TYPE tepqr|NPC <npc No.>}!**.
17. Enter **CHG::SYNC, TLI, SRC(i/(a,b)[,j/(c,d) . . . ,l/(g,h)])!**.
You will also have to change the NPC growth specifications to remove/add the sync source option.
Where:
 i,j ...l = Subject TLI (1 through 4)
 a,b ...g,h = Priorities (8 through 1, low to high) for the sync ports (0,1) on the subject TLI.
 - If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of the denial codes).
18. To restore sync port 0 on the subject TLI in both syncs, enter **RST::SYNC 0, TLI n, SSP 0!** and **RST::SYNC 1, TLI n, SSP 0!**.
19. Repeat Step **18** (substituting SSP 1) to restore sync port 1 on the same TLIs in both syncs.
20. Repeat procedure from Step **10**.

M...UTL QRY STR SYNC a
 byte1, byte2, byte3, byte4, byte5, byte6
 byte7, byte8, byte9, byte10, byte11, byte12 COMPL

BYTE 1 (BITS abcdefgh)

a = spare	e = TLI 1 in service
b = sync hardware failed	f = TLI 2 in service
c = mate failed or OOS	g = TLI 3 in service
d = TB failed or OOS	h = TLI 4 in service

BYTE 3 (BITS abcdefgh)

a = sync reset, needs config.	e = crosscouple trouble
b = DPLL hardware error	f = CRO timing trouble
c = TB error	g = spare
d = PLL symmetry error	h = spare

BYTE 5 BIT POSITIONS: ab cde fgh

SOURCE (BITS ab)	ACTIVE PORT (BITS cde) (if BITS ab = 01)
00 = holdover	000 = TLI 1, SSP 0
01 = timing link	001 = TLI 1, SSP 1
10 = cross-couple	010 = TLI 2, SSP 0
11 = CRO	011 = TLI 2, SSP 1
	100 = TLI 3, SSP 0
	101 = TLI 3, SSP 1
	110 = TLI 4, SSP 0
BITS fgh (unused)	111 = TLI 4, SSP 1

BYTE 9 (BITS abcdefgh)

a = loss of energy	d = TB oven still cold
b = TB command error	e = spare
c = TB oscillator drift (master mode)	fgh = 000 for stratum 3, 001 for 2-Mb/s local 010 for 2-Mb/s toll, 011 for stratum 2

Figure 3-4. Sync Status Register

M...QRY STR SYNC a TLI n byte1, byte2, byte3 COMPL

BYTE 1 BIT POSITIONS: abcd e f g h

0000 = 1.544 Mb/s	0100 = BSRF	e = TLI grown
0001 = 2.048 Mb/s	0101 = 64 kb/s Clock Out	f = TLI out-of-service
0010 = Composite Clock	0110 = 2.048 Mb/s Clock Out	g = TLI hardware error
0011 = Unipolar Clock		h = spare

Figure 3-5. TLI Status Register

M...UTL QRY STR SYNC a TLI n SSP b [NPC <source npc>] 2 LN MSG:
byte1, byte2, byte3, byte4, byte5 COMPL

BYTE 2 SELECTION PRIORITY (01-08) FOR SSPs.

BYTE 3 BIT POSITIONS: abc de fgh

FRAME FORMAT (abc)	LINE FORMAT (de)	FREQ (fgh)
000 = NSA	00 = AMI	000 = 512 KHz
001 = ERSM	01 = HDB3	001 = 1.0 MHz
010 = CAS0		010 = 1.544 MHz
011 = CAS1		011 = 2.048 MHz

BYTE 4 (BITS abcdefgh)

BIT a = Carrier Failure	BIT e = Jitter
BIT b = Energy Loss	BIT f = Phase Step
BIT c = Unipolar Clock Not Defined	BIT g = Spare
BIT d = Spare	BIT h = Spare

Figure 3-6. Sync Port Status Register

Change Synchronizer Time Base Stratum

Overview: This procedure allows changing the level (stratum) of the sync time base while the sync remains in operation. The procedure is to remove one side, degrow the TB and replace it, regrow the sync at the new stratum, configure the sync mode, and restore the side; then repeat the procedure for the TB on the other side. For master timing, the third TB must be replaced before the TB on the other side. A higher stratum (2 versus 3 or toll versus local) provides a more precise timing signal for the network sync plan or office application.



CAUTION:

Performing this procedure incorrectly can interrupt service. Perform each step of the procedure in the order given. Clear any alarms or OOS conditions in the synchronizer before beginning this procedure.

1. Enter the following commands to see the status of each side of sync and to determine which is supplying timing (active). The active side is indicated in the SOURCE field of the STATE message by one of the following: TLI, CRO, or HOLDOVER. The other side will show MATE.

UTL : : QRY, STATE, SYNC! and **UTL : : QRY, STR, SYNC a!**

Where: a = Side 0 or 1.

2. Enter **RMV : : SYNC a!** to remove the inactive sync side.
3. Enter **RMV : : UNIT [q]q, FC sb!** to remove all FCs (format converters) on the same side for all FTU units and modules in each unit.

Where:

[q]q = Unit number (1 through 16)

sb = FC side and module number.



NOTE:

The FCs (same side as inactive sync) are being removed and disconnected to prevent noise on circuits, but this precaution will not be necessary after a change notice is implemented to add a wiring termination to the ECCN.

4. Unplug the same FCs that were previously removed from service.



CAUTION:

Unplugging FC packs on the active side of the sync will cause loss of service in the unit.

5. Enter **DGRTH : : SYNC, TB!** to degrow sync time base.

6. Replace TB pack for same side with code (TG60-TG63) for required stratum (equipment codes are listed in Table 3-10).

Table 3-10. Sync Circuit Pack Cards

Circuit Pack	Code	Growth Type	Description
TB	TG60	TB000	TBS3 (Time Base, Stratum 3) — Domestic Use
	TG61	TB100	TBCL (Time Base, CEPT Local Office)
	TG62	TB200	TBCT (Time Base, CEPT Toll Office)
	TG63	TB300	TBS2 (Time Base, Stratum 2) — Domestic Use
TLI	TG64	TExyz	TXB1 (DS1 Timing Extractor)
	TG65	TPxyz	TXB2 (2.048-Mb/s Primary Block Timing Extractor)
	TG66	TCxyz	TXCC (64 kb/s Composite Clock Timing Extractor)
	TG67	TUxyz	TXUC (Unipolar Clock Timing Extractor)
	TG68	TRxyz	TXRS (BSRF [Reference Frequency] Timing Extractor)
	TG70	TD1yz	TDCC (64 kb/s Composite Clock Timing Distributor)
	TG71	TD2yz	TDS2 (2.048-Mb/s Sine Wave Timing Distributor)
	TG75	TPxyz	TXBT (Primary Block Extractor, 75-Ohm)

7. Enter **GRTH::SYNC,TB,TYPE TBpqr!** to grow new time base.

Where: pqr = 000 for North American stratum 3
 = 100 for international local
 = 200 for international toll
 = 300 for North American stratum 2.

⇒ NOTE:

The completion of this command causes the stratum of the time base in the DACS II data base to differ from the actual in-service sync. FRADTS messages (test number 312) will occur because of this difference, but the situation will be corrected and the FRADTS will cease when this procedure is completed.

8. Enter **CFR::SYNC,{MASTER|SLAVED}!** to configure the sync for the mode that existed previously.

9. If the sync is to be operated at a lower stratum (than it was equipped for above, see Note), enter **CFR::SYNC,STRATUM <level>!**

Where: <level> = STR2 or STR3 for TB TG63;
TOLL, or LOCAL for TB TG62.

⇒ **NOTE:**

This step is provided in case the stratum must be changed for a trouble situation, but it is not likely that the sync would be operated at the lower stratum.

10. Wait 30 minutes for TB oven to reach temperature and then enter **RST::SYNC a!** to restore sync side.

⇒ **NOTE:**

A conditional command completion (COND 94) will be received because the other side must still be changed.

11. How was sync configured?

- If configured as MASTER, continue with Step 12.
- If configured as SLAVED, proceed to Step 17.

12. Enter **RMV::SYNC,TLI 3,CRO!** to remove additional TB pack from service.
13. Replace additional TB pack (located in center TLI slots) with new code for stratum.
14. Enter **DGRTH::SYNC,TLI 3!** to degrow the additional TB.
15. Enter **GRTH::SYNC,TLI 3,TYPE TBpqr!** to regrow same TB with same type field as the TBs on the sides.
16. Wait 30 minutes for TB oven to reach temperature and then enter **RST::SYNC,TLI 3,CRO!**.
17. Reinstall the FC packs in their slots and enter **RST::UNIT [q]q,FC sb!** to restore each one.
18. Verify that each one restored correctly.
19. Enter **RMV::SYNC a!** to remove other sync side.
20. Enter **RMV::UNIT [q]q,FC sb!** to remove all FCs *on the same side* for all FTU units and modules in each unit.

21. Unplug the same FCs that were previously removed from service.

**CAUTION:**

Unplugging FC packs on the active side of the sync will cause loss of service in the unit.

22. Replace TB pack for same side.
23. Wait 30 minutes for TB oven to reach temperature and then enter **RST::SYNC a!**.
24. Reinstall the FC packs in their slots and enter **RST::UNIT [q]q,FC sb!** to restore each one.
25. Enter **UTL::QRY,STATE,SYNC!** to check status of sync.
26. If additional timing links are to be added in SLAVED configuration, proceed to add the links (see *Grow and Restore Sync TLIs*).
27. For stratum 2 operation, it may take 2 hours to reach the rated operating precision.

Cross-Connect Network/Expanded Cross-Connect Network (CCN/ECCN)

Install ECCN Circuit Packs

⇒ NOTE:

If necessary, the installation of the power units for the CCN and CCN2 can be checked per *Install Power Units and Fuses*. The ECCN circuit packs have built-in power converters.

⇒ NOTE:

If this procedure is being used to check the installation of the ECCN circuit packs, you can simply read through the procedure and check the location of the circuit packs.

⇒ NOTE:

The TSI/CCB/CCN/CCNI entities are used in conjunction with the Non-CEF frames while the ETSI/CCI entities are used the CEF frames.

1. Locate the side 0 and side 1 shelves of the ECCN in bay 2 of the frame. See Figure 3-7.
2. Verify that the BT (bus terminator, BBR1 code) circuit packs are securely installed in the designated far-left and far-right slots on each side of the network (ECCN0 and ECCN1). See Figure 3-8.

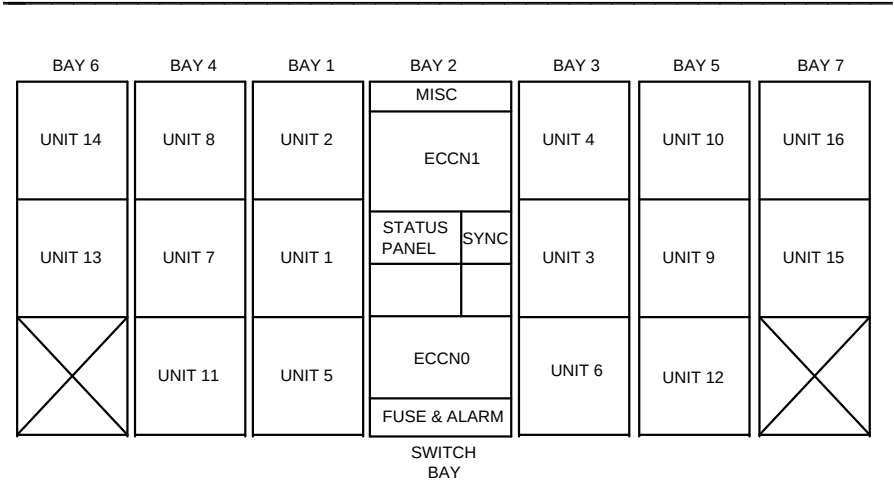


Figure 3-7. Fully-Equipped Capacity Expansion Frame

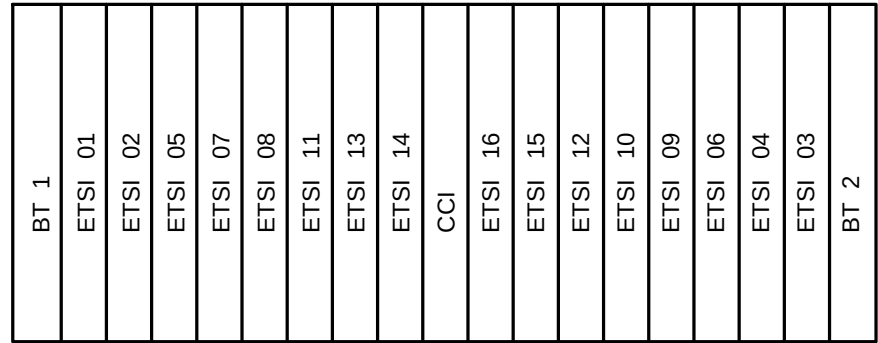


Figure 3-8. Location of Circuit Packs on ECCN Shelf

3. Verify that the CCI (clock control interface, BBS1 code) circuit pack is securely installed in the designated slot on each side of the network (ECCN0 and ECCN1). See Figure 3-8.
4. Enter **UTL::QRY,STR,XC a!** and determine the active and inactive sides. The active side is indicated when the right most data byte equals 05.
Where: a = Either side (0 or 1).
5. Enter **RMV::CCI s!** to remove the *inactive* side from service.
6. Working in the network shelf for the inactive side, install the ETSI (expanded time slot interface) (BBS2) for each unit to be equipped. Push at top and bottom of circuit pack to evenly seat it; then use the latches to secure it in the slot.

**NOTE:**

The ETSI slots are assigned on each side of the common CCI pack to roughly match the associated unit positions and ordering of the units in the CEF configuration.

**NOTE:**

Plugging into the out-of-service side prevents possible transmission hits and possible service removal of NPCs on the ETSI ports.

7. Enter **RST::CCI s!** to restore the CCI for the inactive side to service.
Where: s = Same side.

8. Enter **CFR::XC a!**

Where a = Inactive side to cause side switch (change active side).

**NOTE:**

Switching (E)CCN sides does not cause the SYNCs to switch sides.

9. Enter **RMV::CCI s!** to remove the side (*that was made inactive by the side switch*) from service.
Where: s = New inactive side.
10. Install the required ETSIs on the shelf for the remaining side (now inactive). The equipage is duplicated on both sides of the network so that service can be switched to the duplicated side if the active side fails.
11. Enter **RST::CCI s!** to restore the CCI for the inactive side to service.
Where: s = Same side.

Install Multibay CCN Circuit Packs

1. Locate CCN (cross-connect network) in the frame and notice the organization within the CCN; Figure 3-9 shows the organization.
2. Verify that the CCNI (cross-connect interface) card (UM30) is installed in designated slots on both sides of the CCN.

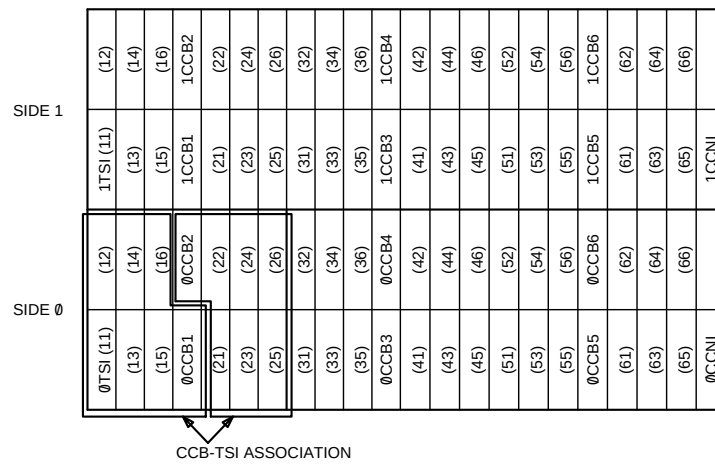


Figure 3-9. Duplicated Cross-Connect Network for Multibay Frame

3. From Table 3-11, determine which CCB (cross-connect buffer) (UM26) and TSI (TM660) circuit pack slots must be equipped to support the DACS units which will be used (1 through 6).

⇒ **NOTE 1:**

The TSI slot numbers show how the cards are connected; for example, TSI 21 connects data from unit 2 to unit 1.

⇒ **NOTE 2:**

Normally, as units are added, TSIs are installed to connect the new unit with every other one and the total number of TSIs equals the total number of units squared.

4. Enter **UTL : :QRY,STR,XC a!** and determine the active and inactive sides. The active side is indicated when the rightmost data byte equals 05.
Where a = Either side (0 or 1).
5. Install the required CCBs (UM26) and TSIs (TM660) on the inactive side. Plugging into the inactive side prevents possible transmission hits.
6. Enter **UTL : :QRY,ALL,COMMON!** and verify that the inactive side is not failed because switching to a failed side will cause loss of service.
7. Enter **CFR : :XC a!**
Where a = Inactive side to cause side switch.
8. Install the required CCBs and TSIs on the remaining side (now inactive).

Table 3-11. Circuit Packs Needed

Unit Number	TSI Number	CCB Number
1	11	1
1, 2	11, 12, 21, 22,	1, 2
1, 2, 3	11, 12, 13, 21, 22, 23, 31, 32, 33	1, 2, 3
1, 2, 3, 4	11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43, 44	1, 2, 3, 4
1, 2, 3, 4, 5	11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 31, 32, 33, 34, 35, 41, 42, 43, 44, 45, 51, 52, 53, 54, 55	1, 2, 3, 4, 5
1, 2, 3, 4, 5, 6	11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 31, 32, 33, 34, 35, 36, 41, 42, 43, 44, 45, 46, 51, 52, 53, 54, 55, 56, 61, 62, 63, 64, 65, 66	1, 2, 3, 4, 5, 6

Install Single-Bay CCN Circuit Packs

1. Locate the CCN (cross-connect network) in the frame and notice the organization within the network; see Figure 3-10.

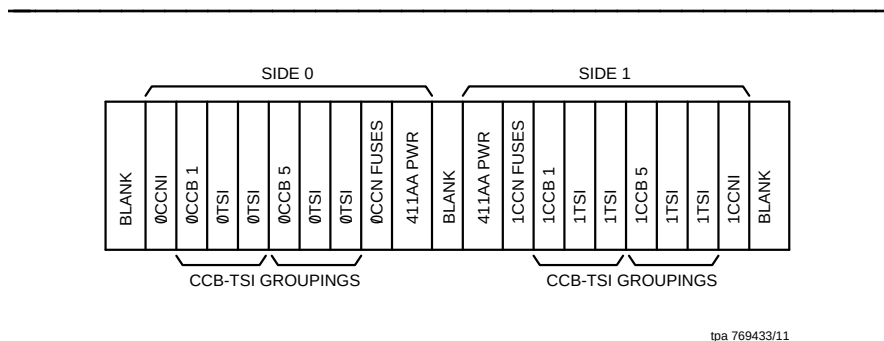


Figure 3-10. CCN Network

2. Verify that the CCNI (cross-connect interface) card (UM30 code) is installed in the designated slots on both sides of CCN.
3. Enter **UTL : :QRY,STR,XC a!** and determine the active and inactive sides. The active side is indicated when the rightmost data byte equals 05.
Where a = Either side (0 or 1).
4. Install the required CCBs (UM26) and TSIs (TM660) on the inactive side. Plugging into the inactive side prevents possible transmission hits.

➡ NOTE:

The TSI designation numbers (11, 15, and 51) indicate how the cards are connected; for example, TSI 11 connects data from unit 1 back to unit 1. If unit 5 is not to be equipped, the procedure to install single-bay CCN circuit packs has been completed.

5. Enter **UTL : :QRY,ALL,COMMON!** and verify that the inactive side is not failed because switching to a failed side will cause loss of service.
6. Enter **CFR : :XC a!**
Where a = Inactive side to cause side switch.
7. Install the required CCBs and TSIs on the remaining side (now inactive).

Units (IFTU, DSPU, and HDS3U)

Install Power Units and Fuses

Install CEF (Capacity Expansion Frame) Power Units and Fuses

1. Locate the power unit slots for the section of the frame being equipped using shelf designation strips. See Figure 3-11 for the original interface bay; where the power units are not included with the unit or circuit group.
2. Determine whether the required codes and quantities of power units are installed per Table 3-12.
3. Determine whether the required 48-volt input fuses are installed in the fuse and alarm panel (bottom frame) per Table 3-13.

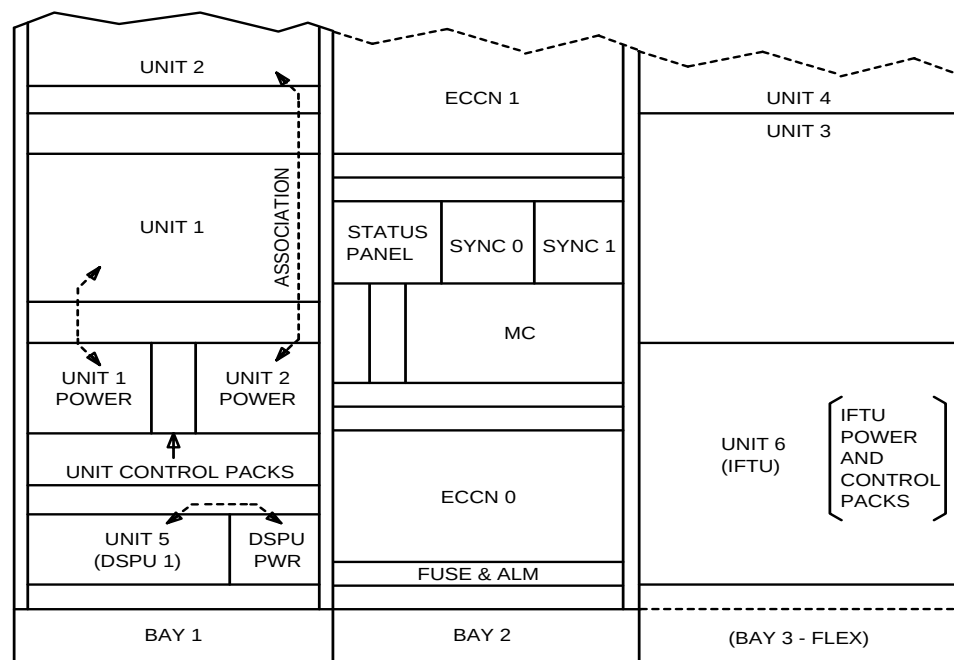


Figure 3-11. Original Interface Bay (Bay 1)

4. Determine whether the fuses are installed in fuse boards per designation strips and Table 3-14 (sync and main controller), Table 3-15 (IFTU), Table 3-16 (DSPU fuses), Table 3-17 (DSPUs 5 and 6 fuses, original interface bay), and Table 3-18 (77-Type Fuses).

⇒ **NOTE:**

FTUs in original interface bays use two GRP 1 (5A) DFBs and one GRP 2 (7.5A & 5A) DFB; the GRP 2 board is for fuses CQ-JX. The DSPU and multibay CCN both use GRP 3 (7.5A) DFBs.

- If the proper power units and fuses have already been installed, the procedure to install CEF power units and fuses has been completed.
- If power units and fuses have not been installed, continue with Step 5.

5. Install the required 48-volt fuses per Table 3-13.
6. Install the required LED fuses per Tables 3-14 through 3-18.
7. Install the required power units. As you move the latch/switch on each to the closed position, notice the LED on the power unit.

Response: The red LED on the power unit is lighted while the latch/switch is open and goes off and remains off when the latch is closed.

8. If any of the required responses did not occur, replace the power unit and confirm the operation of the faceplate LED.
9. Get digital multimeter (such as KS-20599 DMM) and set it to read DC "" range.
10. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN) per Table 3-19. The SPU (sync power unit) does not have test jacks to perform this test.
 - If the requirement of Table 3-19 is met, disconnect the meter.
 - If the requirement of Table 3-19 is not met, replace the power unit.

⇒ **NOTE:**

The FTU power units feed a common bus, and low voltage can only be detected if one power unit is disconnected and the test is repeated for all combinations of the power units.

Table 3-12. CEF Power Unit Summary

Circuit Block	CP Code	Designation/ Location	Equipage
EFC	SM565 411AA	MCP /04-144 PU /04-160	One. One.
SYNC	TG58 TG58	0SPU /14-106 1SPU /14-160	One. One.
ECCN 0	—	—	The CCI and ETSI packs have built-in power converters.
ECCN 1	—	—	The CCI and ETSI packs have built-in power converters.
IFTU (Flex Bay)	411AA 411AA 411AA	PU /x06-168 PU /x14-145 PU /x14-158	All PUs for unit supply a common bus; an extra PU is always provided for backup (for example, PUs 1 & 2 required for FTM 1).
IFTU 2	424AA	PU /16-132 PU /16-144 PU /16-156	Same as IFTU.
DSPU (Flex Bay)	SM566 411AA 411AA	DCP /x04-130 1PU /x04-142 0PU /x04-150	One. One. One.
FTU1/3	411AA 411AA 411AA	PU /x28-012 PU /x28-024 PU /x28-048	All PUs for unit supply a common bus; an extra PU is always provided for backup (for example, PUs 1 & 2 required for FTM 1). Location x = 1 for units 1 & 3 and x = 3 for units 2 & 4.
FTU2/4	411AA 411AA 411AA	PU /x28-124 PU /x28-148 PU /x28-160	Same as FTU 1.
DSPU5/6	SM566 411AA 411AA	DCP5/6 /X12-130 1PU /X12-142 0PU /X12-160	One. Location x = 1 for unit 5 and x = 3 for unit 6. One. One.
DS3U5/6 HDS3U	563A 563A 563A	1 PU/11-140 for unit 6. 2 PU/11-148 3 PU/11-156	One. Location x = 1 for unit 5 and x = 3 One. One.

Table 3-13. 48-Volt Power (For CEF)

Feed A Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
A1	411A, SM566, 424AA, or 563A	Unit 1	70D,5A	Green
A2	411A, SM566, 424AA, or 563A	Unit 2	70D,5A	Green
A3	411A, SM566, 424AA, or 563A	Unit 3	70D,5A	Green
A4	411A, SM566, 424AA, or 563A	Unit 4	70D,5A	Green
A5-1	Indicator for A5-2	-	70G,0.5A	Red
A5-2	CCI,ETSI	ECCN 0	74J,7.5A	-
A6-1	-	-	-	-
A6-2	-	-	-	-
A7	411AA, SM566, 424AA, or 563A	Unit 5	70D,5A	Green
A8	TG58	0SPU (SYNC 0)	70D,5A	Green
A9	411AA, SM566, 424AA, or 563A	Unit 6	70D,5A	Green
A12	411AA, SM566, 424AA, or 563A	Unit 7 (0PU)	70D,5A	Green
A13	411AA, SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
A14	411AA, SM566, 424AA, or 563A	Unit 10	70D,5A	Green
A15	411AA, SM566, 424AA, or 563A	Unit 11 (0PU)	70D,5A	Green
A16	411AA, SM566, 424AA, or 563A	Unit 13 (0PU)	70D,5A	Green
A17	411AA, SM566, 424AA, or 563A	Unit 14 (0PU)	70D,5A	Green
A18	411AA, SM566, 424AA, or 563A	Unit 15	70D,5A	Green
A19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 3-13. Continued

Feed B Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
B1	411A,SM566, 424AA, or 563A	Unit 1	70D,5A	Green
B2	411A,SM566, 424AA, or 563A	Unit 2	70D,5A	Green
B3	411A,SM566, 424AA, or 563A	Unit 3	70D,5A	Green
B4	411A,SM566, 424AA, or 563A	Unit 4	70D,5A	Green
B5-1	-	-	-	-
B5-2	-	-	-	-
B6-1	-	-	-	-
B6-2	-	-	-	-
B7	411AA,SM566, 424AA, or 563A	Unit 5	70D,5A	Green
B8	-	CRO	70D,5A	Green
B9	411AA,SM566, 424AA, or 563A	Unit 6	70D,5A	Green
B12	411AA,SM566, 424AA, or 563A	Unit 7	70D,5A	Green
B13	411AA,SM566, 424AA, or 563A	Unit 9 (0PU)	70D,5A	Green
B14	411AA,SM566, 424AA, or 563A	Unit 10 (0PU)	70D,5A	Green
B15	411AA,SM566, 424AA, or 563A	Unit 11	70D,5A	Green
B16	411AA,SM566, 424AA, or 563A	Unit 12 (0PU)	70D,5A	Green
B17	411AA,SM566, 424AA, or 563A	Unit 14	70D,5A	Green
B18	411AA,SM566, 424AA, or 563A	Unit 15 (0PU)	70D,5A	Green
B19	411AA,SM566, 424AA, or 563A	Unit 16 (0PU)	70D,5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 3-13. Continued

Feed C Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
C1	411A, SM566, 424AA, or 563A	Unit 1 (1PU)	70D,5A	Green
C2	411A, SM566, 424AA, or 563A	Unit 2 (1PU)	70D,5A	Green
C3	411A, SM566, 424AA, or 563A	Unit 3 (1PU)	70D,5A	Green
C4	411A, SM566, 424AA, or 563A	Unit 4 (1PU)	70D,5A	Green
C5-1	Indicator for C5-2	-	70G,0.5A	Red
C5-2	CCI,ETSI	ECCN 1	74J,7.5A	-
C6-1	-	-	-	-
C6-2	-	-	-	-
C7	411AA, SM566, 424AA, or 563A	Unit 5	70D,5A	Green
C8	TG58	1SPU (SYNC 1)	70D,5A	Green
C9	411AA, SM566, 424AA, or 563A	Unit 6 (1PU)	70D,5A	Green
C12	411AA, SM566, 424AA, or 563A	Unit 7 (1PU)	70D,5A	Green
C13	411AA, SM566, 424AA, or 563A	Unit 8 (1PU)	70D,5A	Green
C14	411AA, SM566, 424AA, or 563A	Unit 9	70D,5A	Green
C15	411AA, SM566, 424AA, or 563A	Unit 11 (1PU)	70D,5A	Green
C16	411AA, SM566, 424AA, or 563A	Unit 12	70D,5A	Green
C17	411AA, SM566, 424AA, or 563A	Unit 13 (1PU)	70D,5A	Green
C18	411AA, SM566, 424AA, or 563A	Unit 16	70D,5A	Green
C19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 3-13. Continued

Feed D Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
D1	-	-	-	-
D2	-	-	-	-
D3	-	-	-	-
D4	-	-	-	-
D5-1	-	-	-	-
D5-2	-	-	-	-
D6-1	-	-	-	-
D6-2	-	-	-	-
D7	411AA,424AA, or	+5 MC Power	70D,5A	Green
D9	SM565 (MCP)	MC Power	70B,2A	Orange
D10	-	MTC	70G,0.5A	Red
D12	411AA,SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
D13	411AA,SM566, 424AA, or 563A	Unit 9 (1PU)	70D,5A	Green
D14	411AA,SM566, 424AA, or 563A	Unit 10 (1PU)	70D,5A	Green
D15	411AA,SM566, 424AA, or 563A	Unit 12 (1PU)	70D,5A	Green
D16	411AA,SM566, 424AA, or 563A	Unit 13	70D,5A	Green
D17	411AA,SM566, 424AA, or 563A	Unit 14 (1PU)	70D,5A	Green
D18	411AA,SM566, 424AA, or 563A	Unit 15 (1PU)	70D,5A	Green
D19	411AA,SM566, 424AA, or 563A	Unit 16 (1PU)	70d,5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 3-14. Secondary Power Distribution (Sync and Main Controller) (CEF)

Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
1SPU /14-160	0TLI2 /10-112		EBX /04-128
	0TLI3 /10-120		CPU2 /04-120
	0TLI4 /10-128		EMTC /04-112
	0DPLL /12-084		CI /04-136
	1TLI4 /10-136		EBX /04-128
	1TLI3 /10-144		CPU2 /04-120
	1TLI2 /10-152		EMTC /04-112
	1TLI1 /10-160		CI /04-136

Table 3-15. IFTU Fuse Assignment

Fuse Boards	Designation (Note)	Associated Plug-Ins
ED-9C011-30 ED-9C011-30	+5A1 through +5A4 (1-4 through 17-20) +5A5	4 plug-ins (8 NPCs) per fuse (see +5A5 below)
ED-9C012-30 ED-9C011-30	+5A1 through +5A4 (1 through 20) +5A5, number 1 +5A5, number 2 +5A5, number 3 +5A5, number 4 +5A5, number 5	1 plug-in (2 NPCs) per fuse CPU UBX FTMI 0-Side FC 1-Side FC

Note: Designations +5A1 through +5A4 correspond to the modules (shelves) of the unit. The fuse numbers correspond to the plug-ins on the shelf (either 1 for 1 or 1 fuse per 4 plug-ins, depending on the fuse board).

Table 3-16. DSPU Fuses (Flexible Bay)

Fuse	Side	DSP Position (Note)
(Top) No. 1 No. 2 No. 3 No. 4	0 DSPU	(Left Panel) First and second Third and fourth Fifth and sixth Seventh and eighth
(Bottom) No. 5 No. 6 No. 7 No. 8	1 DSPU	(Right Panel) First and second Third and fourth Fifth and sixth Seventh and eighth

Note: Each fuse supplies two DSP circuit packs.

Table 3-17. DSPU5 and DSPU6 Fuses (Original Interface Bay)

DSPU5		DSPU6	
Fuse or PU/ Location	Associated Circuit Pack/Location	Fuse or PU/ Location	Associated Circuit Pack/Location
(SIDE 0) 0PU/112-160 JBH/112-148	NPC641 /112-006 NPC661 /112-012 NPC681 /112-018 NPC701 /112-024 NPC721 /112-030 NPC741 /112-036 NPC761 /112-042 NPC781 /112-048	(SIDE 0) 0PU/312-160 JBH/312-148	NPC801 /312-006 NPC821 /312-012 NPC841 /312-018 NPC861 /312-024 NPC881 /312-030 NPC901 /312-036 NPC921 /312-042 NPC941 /312-048
(SIDE 1) 1PU/112-142 JBD/112-148	NPC641 /112-074 NPC661 /112-080 NPC681 /112-086 NPC701 /112-092 NPC721 /112-098 NPC741 /112-104 NPC761 /112-110 NPC781 /112-116	(SIDE 1) 1PU/312-142 JBD/312-148	NPC801 /312-074 NPC821 /312-080 NPC841 /312-086 NPC861 /312-092 NPC881 /312-098 NPC901 /312-104 NPC921-310 NPC941 /312-116
DCP5 /112-130	CPU5 /112-056 DSPI5 /112-062	DCP6 /312-130	CPU6 /312-056 DSPI6 /312-062

Table 3-18. 77-Type, FTU Fuses - Original Interface Bay

Fuse (Note)	Associated NPCs			
	FTU 1	FTU 2	FTU 3	FTU 4
CA	1-8	161-168	321-328	481-488
CB	9-16	169-176	329-336	489-496
CC	17-24	177-184	337-344	497-504
CD	25-32	185-192	345-352	505-512
CE	33-40	193-200	353-360	513-520
CF	41-48	201-208	361-368	521-528
CG	49-56	209-216	369-376	529-536
CH	57-64	217-224	377-384	537-544
CI	65-72	225-232	385-392	545-552
CJ	73-80	233-240	393-400	553-560
CK	81-88	241-248	401-408	561-568
CL	89-96	249-256	409-416	569-576
CM	97-104	257-264	417-424	577-584
CN	105-112	265-272	425-432	585-592
CO	113-120	273-280	433-440	593-600
CP	121-128	281-288	441-448	601-608
CQ	129-136	289-296	449-456	609-616
CR	137-144	297-304	457-464	617-624
CS	145-152	305-312	465-472	625-632
CT	153-160	313-320	473-480	633-640
CU	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4
CV	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4
JW	FTMI 1-4	FTMI 1-4	FTMI 1-4	FTMI 1-4
JX	CPU,UBX	CPU,UBX	CPU,UBX	CPU,UBX

Note: The unit number that the fuses supply is identified on the fuse panel.

Table 3-19. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 -11.75 to -12.25	+V2 -V2	RTN RTN
411AA	+5.1 to +5.3	+	–
TG58	+4.75 to +5.25 -4.95 to -5.45	+	–
424AA	+5.0 to +5.5	+	–
485AB	+5.1 to +5.4	+	–
SM566	+4.75 to +5.25	+	–
563A	+4.9 to +5.3	5.5V	GRD

Install Multibay Power Units and Fuses

1. Locate the power unit slots for the section of the frame being equipped using Figure 3-12 and the shelf designation strips. A DSPU is shown in unit 5; but with flexible side bays, DSPUs can be mounted in other unit positions.

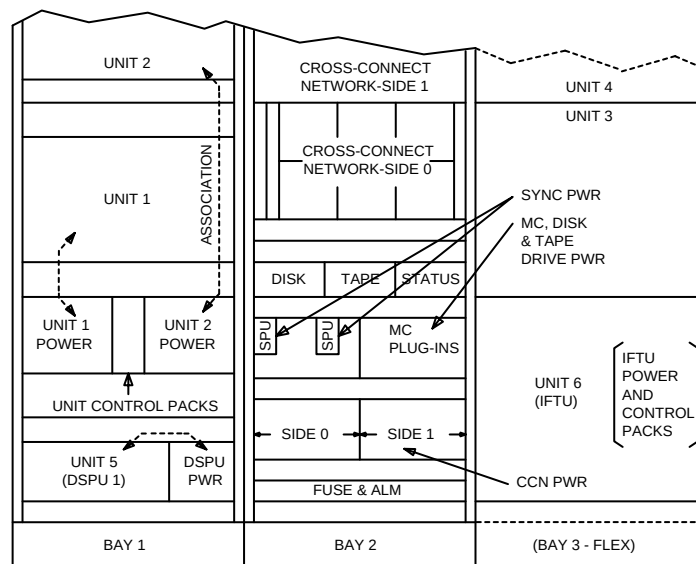


Figure 3-12. Multibay Frame Layout

2. Determine whether the required codes and quantities of power units are installed per Table 3-20.

⇒ NOTE:

Only three power units are needed in FTUs equipped with the codes of Series 5 (or later) TG80 DDCs (for DS1 lines). Because of the lower power requirements, three power units will supply the load and provide reserve power in case one fails.

3. Determine whether the required 48-volt input fuses are installed in the fuse and alarm panel (bottom frame) per Table 3-21.

4. Determine whether the LED output fuses are installed in ED-2C863-30 DFBs (dual fuse boards) per designation strips and Tables 3-22 through 3-26.

⇒ NOTE:

Version 1 FTUs use two GRP 1 (5A) DFBs and one GRP 2 (7.5A & 5A) DFB; the GRP 2 board is for fuses CQ-JX. The DSPU and multibay CCN both use GRP 3 (7.5A) DFBs.

- If the proper power units and fuses already have been installed, the procedure to install multibay power units and fuses has been completed.
 - If proper units and fuses have not been installed, continue with Step 5.
5. Install the required 48-volt fuses per Table 3-21.
 6. Install the required LED fuses per Tables 3-22 through 3-26.
 7. Install the required power units. As you move the latch/switch on each to the closed position, notice the LED on the power unit.

Response: The red LED on the power unit is lighted while the latch/switch is open and goes off and remains off when the latch is closed.
 8. If any of the required responses did not occur, replace the power unit and confirm the operation of the faceplate LED.
 9. Get digital multimeter (such as KS-20599 DMM) and set it to read DC "" range.
 10. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN) per Table 3-27. The SPU (sync power unit) does not have test jacks to perform this test.
 - If the requirement of Table 3-27 is met, disconnect the meter.
 - If the requirement of Table 3-27 is not met, replace the power unit.

⇒ NOTE:

The FTU power units feed a common bus, and low voltage can only be detected if one power unit is disconnected and the test is repeated for all combinations of the power units.

Table 3-20. Power Unit Summary (Non-CEF)

Circuit Block	CP Code	Designation/ Location	Equipage
MC	SM565 411AA 484GA	MCP /225-136 PU /225-148 PU /225-160	One One One
SYNC	TG58 TG58	0SPU /227-010 1SPU /227-064	One One
FTU1	411AA 411AA 411AA 411AA	PU /128-012 PU /128-024 PU /128-048 PU /128-064*	All PUs for unit supply a common bus; an extra PU is always provided for backup (for example, PUs 1 & 2 required for FTM 1).
FTU2	411AA 411AA 411AA 411AA	PU /128-108* PU /128-124 PU /128-148 PU /128-160	Same as unit 1.
FTU3	411AA 411AA 411AA 411AA	PU /328-012 PU /328-024 PU /328-048 PU /328-064*	Same as unit 1.
FTU4	411AA 411AA 411AA 411AA	PU /328-108* PU /328-124 PU /328-148 PU /328-160	Same as unit 1.
CCN0	485AB 485AB 485AB 485AB 485AB	PU1 /215-016 PU2 /215-032 PU3 /215-048 PU4 /215-068	PU1 for CCNI, CCBs 1, 2, TSIs 11, 12, 13, 14, 15, 16, 21, 22 PU2 for CCB 3, TSIs 23, 24, 25, 26, 31, 32, 33, 34, 35, 36 PU3 for CCB 4, TSIs 41, 42, 43, 44, 45, 46, 51, 52, 53, 54 PU4 for CCBs 5, 6, TSIs 55, 56, 61, 62, 63, 64, 65, 66
CCN1	485AB 485AB 485AB 485AB 485AB	PU5 /215-108 PU6 /215-128 PU7 /215-144 PU8 /215-160	PU5 Same assignment as Side 0 PU6 PU7 PU8
DSPU5	SM566 411AA 411AA	DCP5 /109-130 1PU /109-142 0PU /109-160	One One One
DSPU6	SM566 411AA 411AA	DCP6 /312-130 0PU /312-142 1PU /312-160	One One One

*These PUs are not required with Series 5 (or later) TG80 and new DDC codes; three PUs per unit will supply the load plus reserve in case one fails.

Table 3-21. 48-Volt Power (Non-CEF)

Fuse	Power Unit/CP			
	Type	Designation/ Location	Size	Bead Color
A1	411AA	128-012	70D,5A	Green
A2	411AA	128-108	70D,5A	Green
A3	411AA	328-012	70D,5A	Green
A4	411AA	328-108	70D,5A	Green
A5-1	485AB	PU1 (CCN0)	70D,5A	Green
A5-2	-	-	-	-
A6-1	485AB	PU2 (CCN 0)	70D,5A	Green
A6-2	-	-	-	-
A7	411AA	1PU (Unit 5)	70D,5A	Green
A8	TG58	0SPU (SYNC 0)	70D,5A	Green
A8	-	0TB	70D,5A	Green
A9	411AA	1 PU (UNIT 6)	70D,5A	Green
B1	411AA	128-024	70D,5A	Green
B2	411AA	128-124	70D,5A	Green
B3	411AA	328-024	70D,5A	Green
B4	411AA	328-124	70D,5A	Green
B5-1, B5-2	485AB	PU3 (CCN 0)	70D,5A	Green
B6-1, B6-2	485AB	PU4 (CCN 0)	70D,5A	Green
B7	411AA	0PU (UNIT 5)	70D,5A	Green
B8	TG58	1SPU (SYNC 1)	70D,5A	Green
B8	-	1TB	70D,5A	Green
B9	411AA	0PU (UNIT 6)	70D,5A	Green

Table 3-21. Continued

Fuse	Power Unit/CP			
	Type	Designation/ Location	Size	Bead Color
C1	411AA	128-048 (Unit 1)	70D,5A	Green
C2	411AA	128-148 (Unit 2)	70D,5A	Green
C3	411AA*, 424AA, SM566, or 563A	328-048* (Unit 3)	70D,5A	Green
C4	411AA*, 424AA, SM566, or 563A	328-148* (Unit 4)	70D,5A	Green
C5-1	-	Indicator for C5-2	70G,.5A	Red
C5-2,	485AB	PU5 (1CCN)	70D,5A	Green
C6-1	-	Indicator for C6-2	70G,.5A	Red
C6-2,	485AB	PU6 (1CCN)	70D,5A	Green
C7	411AA	(Unit 5)	70D,5A	Green
C8	-	TLIs	70D,5A	Green
C9	SM566*, 424AA, 411AA, or 563A	DCP6* (Unit 6)	70D,5A	Green
D1	411AA	128-064 (Unit 1)	70D,5A	Green
D2	411AA	128-160 (Unit 2)	70D,5A	Green
D3	411AA*, 424AA, SM566, or 563A	328-064* (Unit 3)	70D,5A	Green
D4	411AA*, 424AA, SM566, or 563A	326-160* (Unit 4)	70D,5A	Green
D5-1	-	Indicator for D5-2	70G,.5A	Red
D5-2	485AB	PU7 (1CCN)	70D,5A	Green
D6-1	-	Indicator for D5-2	70G,.5A	Red
D6-2,	485AB	PU8 (1CCN)	70D,5A	Green
D7	411AA	226-148	70D,5A	Green
D8	-	226-160	70D,5A	Green
D9	411AA	226-136 (MCP)	70,2A	Orange
D10	-	MTC	70G,.5A	Red

Note: These are power units and locations for non-flex bay 3; An FTU in units 3 and 4, and a DSPU in unit 6.

Table 3-22. Sync and Main Controller (Non-CEF)

Synchronizer		Main Controller	
Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
0SPU /227-010	0TLI1 /223-008 0TLI2 /223-016 0TLI3 /223-024 0TLI4 /223-032 0DPLL /225-076	MCP /225-136	BX /225-100 CPU2 /225-108 MTC /225-120 CI /225-128
A8 FUSE 1SPU /227-064	0TB /227-032 1TLI1 /223-064 1TLI2 /223-056 1TLI3 /223-048 1TLI4 /223-040	PU /225-148	BX /225-100 CPU2 /225-108 MTC /225-120 CI /225-128

Table 3-23. IFTU Fuse Assignment

Fuse Boards	Designation (Note)	Associated Plug-Ins
ED-9C011-30 ED-9C011-30	+5A1 through +5A4 (1-4 through 17-20) +5A5	4 plug-ins (8 NPCs) per fuse (see +5A5 below)
ED-9C012-30 ED-9C011-30	+5A1 through +5A4 (1 through 20) +5A5, number 1 +5A5, number 2 +5A5, number 3 +5A5, number 4 +5A5, number 5	1 plug-in (2 NPCs) per fuse CPU UBX FTMI 0-Side FC 1-Side FC

Note: Designations +5A1 through +5A4 correspond to the modules (shelves) of the unit. The fuse numbers correspond to the plug-ins on the shelf (either 1 for 1 or 1 fuse per 4 plug-ins, depending on the fuse board).

Table 3-24. CCN Fuses (Original Interface Bay)

CCN0		CCN1	
Fuse/ Location	Associated Circuit Pack/Location	Fuse/ Location	Associated Circuit Pack/Location
JA1 /215-072	0CCN1 /246-150	JA1 /215-088	1CCN1 /269-150
	0TSI11 /246-014		1TSI11 /269-014
	0TSI13 /246-020		1TSI13 /269-020
JA2	0CCB1 /246-032	JA2	1CCB1 /269-032
	0TSI15 /246-026		1TSI15 /269-026
	0TSI21 /246-038		1TSI21 /269-038
JA3	0TSI12 /254-014	JA3	1TSI12 /277-014
	0TSI14 /254-020		1TSI14 /277-020
	0TSI16 /254-026		1TSI16 /277-026
JA4	0CCB2 /254-032	JA4	1CCB2 /277-032
	0TSI22 /254-038		1TSI22 /277-038
JA5	0TSI23 /246-044	JA5	1TSI23 /269-044
	0TSI25 /246-050		1TSI25 /269-050
	0TSI31 /246-056		1TSI31 /269-056
JA6	0CCB3 /246-078	JA6	1CCB3 /269-078
	0TSI33 /246-066		1TSI33 /269-066
	0TSI35 /246-072		1TSI35 /269-072
JA7	0TSI24 /254-044	JA7	1TSI24 /277-044
	0TSI26 /254-050		1TSI26 /277-050
	0TSI32 /254-056		1TSI32 /277-056
JA8	0TSI34 /254-066	JA8	1TSI34 /277-066
	0TSI36 /254-072		1TSI36 /277-072
JB1 /215-076	0TSI41 /246-084	JB1 /215-092	1TSI41 /269-084
	0TSI43 /246-090		1TSI43 /269-090
	0TSI45 /246-096		1TSI45 /269-096
JB2	0TSI51 /246-102	JB2	1TSI51 /269-102
	0TSI53 /246-108		1TSI53 /269-108
JB3	0CCB4 /254-078	JB3	1CCB4 /277-078
	0TSI42 /254-084		1TSI42 /277-084
	0TSI44 /254-090		1TSI44 /277-090
JB4	0TSI46 /254-096	JB4	1TSI46 /277-096
	0TSI52 /254-102		1TSI52 /277-102
	0TSI54 /254-108		1TSI54 /277-108
JB5	0CCB5 /246-124	JB5	1CCB5 /269-124
	0TSI55 /246-118		1TSI55 /269-118
	0TSI61 /246-130		1TSI61 /269-130
JB6	0TSI63 /246-136	JB6	1TSI63 /269-136
	0TSI65 /246-142		1TSI65 /269-142
JB7	0CCB6 /254-124	JB7	1CCB6 /277-124
	0TSI56 /254-118		1TSI56 /277-118
	0TSI62 /254-130		1TSI62 /277-130
JB8	0TSI64 /254-136	JB8	1TSI64 /277-136
	0TSI66 /254-142		1TSI66 /277-142

Table 3-25. 77-Type, FTU Fuses (Original Interface Bay)

Fuse (Note)	Associated NPCs			
	FTU 1	FTU 2	FTU 3	FTU 4
CA	1-8	161-168	321-328	481-488
CB	9-16	169-176	329-336	489-496
CC	17-24	177-184	337-344	497-504
CD	25-32	185-192	345-352	505-512
CE	33-40	193-200	353-360	513-520
CF	41-48	201-208	361-368	521-528
CG	49-56	209-216	369-376	529-536
CH	57-64	217-224	377-384	537-544
CI	65-72	225-232	385-392	545-552
CJ	73-80	233-240	393-400	553-560
CK	81-88	241-248	401-408	561-568
CL	89-96	249-256	409-416	569-576
CM	97-104	257-264	417-424	577-584
CN	105-112	265-272	425-432	585-592
CO	113-120	273-280	433-440	593-600
CP	121-128	281-288	441-448	601-608
CQ	129-136	289-296	449-456	609-616
CR	137-144	297-304	457-464	617-624
CS	145-152	305-312	465-472	625-632
CT	153-160	313-320	473-480	633-640
CU	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4
CV	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4
JW	FTMI 1-4	FTMI 1-4	FTMI 1-4	FTMI 1-4
JX	CPU, UBX	CPU, UBX	CPU, UBX	CPU, UBX

Note: The unit number that the fuses supply is identified on the fuse panel.

Table 3-26. DSPU5 and DSPU6 Fuses

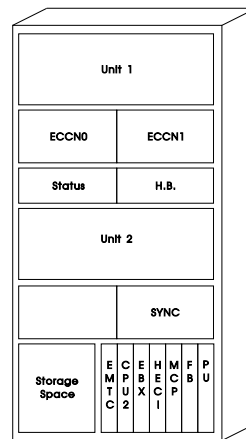
DSPU5		DSPU6	
Fuse or PU/ Location	Associated Circuit Pack/Location	Fuse or PU/ Location	Associated Circuit Pack/Location
(SIDE 0) OPU/112-160 JBH/112-148	NPC641 /112-006 NPC661 /112-012 NPC681 /112-018 NPC701 /112-024 NPC721 /112-030 NPC741 /112-036 NPC761 /112-042 NPC781 /112-048	(SIDE 0) OPU/312-160 JBH/312-148	NPC801 /312-006 NPC821 /312-012 NPC841 /312-018 NPC861 /312-024 NPC881 /312-030 NPC901 /312-036 NPC921 /312-042 NPC941 /312-048
JBG		JBG	
JBF		JBF	
JBE		JBE	
(SIDE 1) 1PU/112-142 JBD/112-148	NPC641 /112-074 NPC661 /112-080 NPC681 /112-086 NPC701 /112-092 NPC721 /112-098 NPC741 /112-104 NPC761 /112-110 NPC781 /112-116	(SIDE 1) 1PU/312-142 JBD/312-148	NPC801 /312-074 NPC821 /312-080 NPC841 /312-086 NPC861 /312-092 NPC881 /312-098 NPC901 /312-104 NPC921-310 NPC941 /312-116
JBC		JBC	
JBB		JBB	
JBA		JBA	
DCP5 /112-130	CPU5 /112-056 DSPI5 /112-062	DCP6 /312-130	CPU6 /312-056 DSPI6 /312-062

Table 3-27. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 -11.75 to -12.25	+V2 -V2	RTN RTN
411AA	+5.1 to +5.3	+	-
TG58	+4.75 to +5.25 -4.95 to -5.45	+	-
424AA	+5.0 to +5.5	+	-
485AB	+5.1 to +5.4	+	-
SM566	+4.75 to +5.25	+	-
563A	+4.9 to +5.3	5.5V	GRD

Install Single-Bay Power Units and Fuses

1. Locate the power unit slots for the section of the frame being equipped using Figure 3-13 and the shelf designation strips.
2. Determine whether the required codes and quantities of power units.
3. Determine whether the required 48 V input fuses are installed in the fuse and alarm panel (top-frame) per Table 3-28.



Notes:

SYNC = Synchronizer
 ECCN = Enhanced Cross-Connect Network
 EMTC = Expanded Maintenance Circuit
 CPU2 = Central Processing Unit 2
 EBX = Enhanced Bus Extender
 HECI = High Speed Enhanced Communications Interface
 MCP = Main Controller Processor
 FB = Fuse Board
 PU = Power Unit

Figure 3-13. Single-Bay Frame

4. Determine whether the LED output fuses are installed in the ED-2C863-30 DFBs (dual fuse boards) per designation strips and Tables 3-29 (only FTU 1 column of Table 3-29 applies to a single-bay frame), Table 3-30 (DSPU 5 side only), and Table 3-31. The FTU uses two GRP 1 (5A) DFBs and one GRP 2 (7.5A & 5A) DFB; the GRP 2 board is for fuses CQ-JX. The DSPU uses a GRP 3 (7.5A) DFB, and the CCN2 uses a GRP 4 (5A) DFB.
 - If the proper power units and fuses have already been installed, the procedure to install single-bay power units and fuses has been completed.
 - If power units and fuses have not been installed, continue with Step 5.
5. Install the required 48 V fuses per Table 3-28.
6. Install the required LED fuses per Tables 3-29, 3-30, and 3-31.
7. Install the required power units. The FTU power units should be equipped in left-to-right order even though they all feed a common bus.

Response: The red LED on the power unit lights and remains lighted with the power unit latch/switch open.
8. Close the power unit latch/switch.

Response: The red LED on the power unit goes off and remains off.
9. If any of the responses did not occur, replace the power unit, turn the replacement on, and confirm the operation of the power unit LED.
10. Get digital multimeter (such as KS-20599 DMM) and set it to read DC "" range.
11. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN) per Table 3-32. The SPU (sync power unit) does not have test jacks to perform this test.
 - If the requirement of Table 3-32 is met, disconnect the meter.
 - If the requirement of Table 3-32 is not met, replace the power unit.

**NOTE:**

The FTU power units feed a common bus, and low "" can only be detected if one power unit is disconnected and the test is repeated for all combinations of the power units.

Table 3-28. Single-Bay 48-Volt Fuses

Fuse	Power Unit	
	Type	Designation/Location
A1	411AA	FTU1-First PU
A2	TG58	0SPU (Sync Power)
A3	411AA	0PU (DSPU Side 0 Power)
A4	411AA	CCN2 Side 0 Power Unit
B1	411AA	FTU1-Second PU
B2	TG58	1SPU (Sync Power)
B3	411AA	1PU (DSPU Side 1 Power)
B4	411AA	CCN2 Side 1 Power Unit
C1	411AA	FTU1-Third PU
C2	NONE	48 Volts to TLIs 1-4, Both Sides
C3	SM566	DCP (DSPU Power)
D2	411AA	+5 Controller Power
D4	SM565	MCP (Main Controller Power)
D5	NONE	48 Volts to MTC Pack

Table 3-29. 77-Type, FTU Fuses - Single-Bay Frame

Fuse (Note)	Associated NPCs
	FTU 1
CA	1-8
CB	9-16
CC	17-24
CD	25-32
CE	33-40
CF	41-48
CG	49-56
CH	57-64
CI	65-72
CJ	73-80
CK	81-88
CL	89-96
CM	97-104
CN	105-112
CO	113-120
CP	121-128
CQ	129-136
CR	137-144
CS	145-152
CT	153-160
CU	(0)FC 1-4
CV	(1)FC 1-4
JW	FTMI 1-4
JX	CPU, UBX
Note: The unit number that the fuses supply is identified on the fuse panel.	

Table 3-30. DSPU5 Fuses

DSPU5		DSPU6	
Fuse or PU/ Location	Associated Circuit Pack/Location	Fuse or PU/ Location	Associated Circuit Pack/Location
(SIDE 0) 0PU/109-160 JBH/109-148	NPC641 /109-006 NPC661 /109-012 NPC681 /109-018 NPC701 /109-024 NPC721 /109-030 NPC741 /109-036 NPC761 /109-042 NPC781 /109-048	(SIDE 0) 0PU/312-160 JBH/312-148	NPC801 /312-006 NPC821 /312-012 NPC841 /312-018 NPC861 /312-024 NPC881 /312-030 NPC901 /312-036 NPC921 /312-042 NPC941 /312-048
JBG		JBG	
JBF		JBF	
JBE		JBE	
(SIDE 1) 1PU/109-142 JBD/109-148	NPC641 /109-074 NPC661 /109-080 NPC681 /109-086 NPC701 /109-092 NPC721 /109-098 NPC741 /109-104 NPC761 /109-110 NPC781 /109-116	(SIDE 1) 1PU/312-142 JBD/312-148	NPC801 /312-074 NPC821 /312-080 NPC841 /312-086 NPC861 /312-092 NPC881 /312-098 NPC901 /312-104 NPC921-310 NPC941 /312-116
JBC		JBC	
JBB		JBB	
JBA		JBA	
DCP5 /109-130	CPU5 /109-056 DSPI5 /109-062	DCP6 /312-130	CPU6 /312-056 DSPI6 /312-062

Table 3-31. Sync and Main Controller (Single-Bay)

Synchronizer		Main Controller	
Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
	OTLI2 /130-016		BX /132-100
	OTLI3 /130-024		CPU2 /132-108
	OTLI4 /130-032		MTC /132-120
	0DPLL /132-076		CI /132-128
	1TLI2 /130-056		BX /132-100
	1TLI3 /130-048		CPU2 /132-108
	1TLI4 /130-040		MTC /132-120
	1DPLL /132-084		CI /132-128

Table 3-32. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 -11.75 to -12.25	+V2 -V2	RTN RTN
411AA	+5.1 to +5.3	+	–
TG58	+4.75 to +5.25 -4.95 to -5.45	+	–
424AA	+5.0 to +5.5	+	–
485AB	+5.1 to +5.4	+	–
SM566	+4.75 to +5.25	+	–
563A	+4.9 to +5.3	5.5V	GRD

Install Plugs-Ins, Grow and Restore FTU/IFTU

Install FTM Circuit Packs (FTMIs and FCs)

1. Determine which unit and FTMs (facility terminating modules) need to be equipped to support the added service; see Table 3-33 for NPC location in the unit (table shows extended numbering).
2. Notice the three versions of FTUs shown in Figures 3-14, 3-15, and 3-16.

**NOTE:**

For 2.048-Mb/s Interface and Enhanced 2.048-Mb/s Interface, the last eight NPCs (four DPCs) are not equipped.

3. If not already installed, install the **TG81** code FTMi and the **TG79** code of FCs (format converters) for the FTMs to be equipped (Figure 3-14 or 3-15).
4. If the circuit pack dual cards (for example, DPC) for the NPCs to be equipped are provided, install them in the NPC slots.

**NOTE:**

Each circuit pack card contains the circuitry for two NPCs.

**NOTE:**

Various codes of circuit packs for the NPCs are available to provide the required line interface and functions. If you do not know the NPC requirement, wait until the facility is established to install NPC circuit packs.

Table 3-33. NPC Location in Unit (Extended Numbering)

Hierarchical NPC Number	Unit Number	FTMI Number
001-032	1	1
041-072	1	2
081-112	1	3
121-152	1	4
161-182	2	1
201-232	2	2
241-272	2	3
281-312	2	4
321-352	3	1
361-392	3	2
401-432	3	3
441-472	3	4
481-512	4	1
521-552	4	2
561-592	4	3
601-632	4	4
641-672	5	1
681-712	5	2
721-752	5	3
761-792	5	4
801-832	6	1
841-872	6	2
881-912	6	3
921-952	6	4
961-992	7	1
1001-1032	7	2
1041-1072	7	3
1081-1112	7	4
1121-1152	8	1
1161-1192	8	2
1201-1232	8	3
1241-1272	8	4

Continued on next page

Table 3-33. Continued

Nonhierarchical NPC Number	Unit Number	FTMI Number
1281-1312	9	1
1321-1352	9	2
1361-1392	9	3
1401-1432	9	4
1441-1472	10	1
1481-1512	10	2
1521-1552	10	3
1561-1592	10	4
1601-1632	11	1
1641-1672	11	2
1681-1712	11	3
1721-1752	11	4
1761-1792	12	1
1801-1832	12	2
1841-1872	12	3
1881-1912	12	4
1921-1952	13	1
1961-1992	13	2
2001-2032	13	3
2041-2072	13	4
2081-2112	14	1
2121-2152	14	2
2161-2192	14	3
2201-2232	14	4
2241-2272	15	1
2281-2312	15	2
2321-2352	15	3
2361-2392	15	4
2401-2432	16	1
2441-2472	16	2
2481-2512	16	3
2521-2552	16	4

FTM 4	NPC (121-140)	0 F C (4)	F T M I (4)	1 F C (4)	NPC (141-160)
FTM 3	NPC (081-100)	0 F C (3)	F T M I (3)	1 F C (3)	NPC (101-120)
FTM 2	NPC (041-060)	0 F C (2)	F T M I (2)	1 F C (2)	NPC (061-080)
FTM 1	NPC (001-020)	0 F C (1)	F T M I (1)	1 F C (1)	NPC (021-040)

Figure 3-14. Original FTU

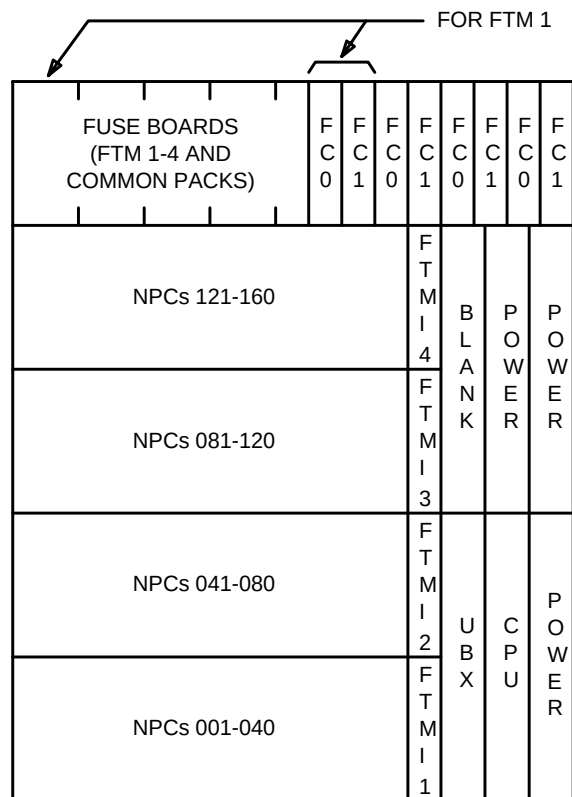


Figure 3-15. Integrated Facility Terminating Unit ED9C004-30 G1 or G2

FUSE BOARDS 1 - 17				B L A N K	P O W E R	P O W E R	B L A N K
FTM 4	NPCs 121 - 140	F C O	F T M I 1	F C 1	NPCs 141 - 160	BLANK	
FTM 3	NPCs 80 - 100	F C O	F T M I 2	F C 1	NPCs 101 - 120		
FTM 2	NPCs 41 - 60	F C O	F T M I 3	F C 1	NPCs 61 - 80	U B X	C P U
FTM 1	NPCs 1 - 20	F C O	F T M I 4	F C 1	NPCs 21 - 40		
						B L A N K	

Figure 3-16. Integrated Facility Terminating Unit 2 ED9C004-30 G3

Grow FTU/IFTU

Overview: This procedure is used to grow the unit in the data base and to define the type of application (FTU/IFTU). The associated ETSI in the cross-connect network is grown when this command is executed as indicated in the completion message. The ETSI will be restored in *Restore ECCN and CCN* in this section.

⇒ NOTE:

If the peripheral unit is not recorded in the software configuration file, the growth command in this procedure will be denied (INERR BAD ARG).

1. If you need to see the unit assignments that have been entered in the software configuration file, enter **UTL : :QRY,CNFG!** (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the CFR FRAME program.

⇒ NOTE:

Unit designations (1 through 16, left to right) are 1 for FTU Version 1, 2 for DSPU, 3 for DS3U, 4 for FTU Version 2, or dash for not designated.

2. Familiarize yourself with the command

GRTH:[FRM xy,SEQ ww]:UNIT [q]q,[TYPE FTxyz]

Where: xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

[q]q = Unit number (1 through 16)

xyz = Variables that define type parameters;

xyz = 100 unless different value is given in circuit order information.

CONN(a[,b[,c[,d[,e[,f]]]]]) = Optional, to limit unit connectivity to itself (a) or certain other units (b,c, etc.).

CONN is only applicable for non-CEF frames.

⇒ NOTE:

If the FTxyz field is omitted, the default type FT100 applies.

3. Enter the command with the required information.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
4. Repeat the procedure for any other units to be grown.

Restore ECCN and CCN

Restore ECCN

1. If the CCI pack was just installed in a previous procedure, enter
RST:[FRM xy,SEQ ww]:CCI s!

Where: xy = DACS II frame number (00 through ZZ)
ww = Command sequence (00 through 49)
s = Network side (0 or 1).

⇒ NOTE:

The two BTs (bus terminators) for the shelf are also restored with the CCI circuit pack.

2. Use one of the following commands to restore the ETSIs:

Restore all ETSIs - **RST:[FRM xy,SEQ ww]:ETSI, ECCN s, ALL!**

Restore ETSIs individually - **RST::ETSI sqq!**

Where: sqq = ETSI number consisting of Side (0 or 1)
and peripheral unit number (01 through 16).

- If any restore command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

If the DACS II has a CCN, then proceed to the next section, *Restore CCN*.
Otherwise, proceed to the section, *Restore UC*.

Restore CCN

Overview: The restore commands in this procedure are given in the order which establishes communications within the network and enables the restoral of the next pack in the list. The CCB and TSI packs that need to be restored after a new unit is grown are listed in the growth completion message.

1. If the network interface pack (CCNI) was just installed in a previous procedure, enter **RST:[FRM xy,SEQ ww]:CCNI s!**

Where:
xy = DACS frame number (00 through ZZ)
ww = Command sequence (00 through 49)
s = Network side (0 or 1).

2. If a DSPU CCB was just installed in a previous procedure, enter
RST:[FRM xy,SEQ ww]:CCB sf!

Where: sf = CCB number consisting of the Side (0 or 1) and position (1 through 6); for example, CCB 12 is on side 1 and is associated with Unit 2 TSIs.

3. Use one of the following commands to restore the TSIs:

Restore all TSIs in a unit

**RST:[FRM xy,SEQ ww]:TSIS,CCN s,UNIT q
 [,CONN (a[,b[,c[,d[,e[,f]]]]))]]!**

Restore all the TSIs on a side (see Note)

RST::TSIS,CCN s,ALL!

Restore TSIs individually

RST::TSI sft!

⇒ NOTE:

Each of the 72 TSIs is listed in the output by the From-, To-Unit ID along with results (DGN A, C, S, D and RST C or D).

A = ATP (all tests passed)

C = Completed

D = Denied

S = STF (same test failed)

- If any restore command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Where: q = Unit number (1 through 6).

s = Side (0 or 1)

(a[,b[,c[,d[,e[,f]]]])) = Optional, to specify the limited unit connectivity (thereby the associated TSIs)

sft = TSI number consisting of Side (0 or 1), FROM-unit (1 through 6), and TO-unit (1 through 6); for example, TSI 013 is on Side 0 and receives data FROM unit 1 and connects TO unit 3.

Restore UC

1. Enter **RST::UNIT [q]q,UC!** to restore unit controller.

Where [q]q = Unit number (1 through 16).

➤ NOTE:

For the CEF, the unit UC diagnostic for the restore operation runs wiring tests between the unit and the EMC.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Grow FTMI

Overview: This procedure contains the use of the command to grow the FTMI in the data base and to specify the line impedance of the DPCs to be used in the module, either 120-ohm for twisted wire pairs or 75-ohm for coaxial cable. This growth operation results in the associated FCs being grown also.

1. Enter **GRTH:[FRM xy,SEQ ww]:UNIT [q]q,FTMI d,IMP zzz!**

Where:

xy = DACS II frame number (00 through ZZ)
ww = Command sequence number (00 through 49)
[q]q = Unit number (1 through 16)
d = FTM interface number (1 through 4)
zzz = 075 for 75-ohm coaxial impedance or 120 for 120-ohm twisted pair impedance.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
2. Repeat the procedure for other FTMs to be grown.

Restore FTMI and FCs

Overview: The following restore commands are given in the order which establishes communications with the unit and enables the restoral of the next pack in the list. After a higher level pack is restored, all the next lower packs can be restored which in turn allows restoral of any of the lower level packs.

1. Enter **RST:[FRM xy,SEQ ww]:UNIT [q]q,FTMI b!**

Where: b = FTM interface number (1 through 4).

2. Enter **RST:[FRM xy,SEQ ww]:UNIT [q]q,FC sf!** to restore the FCs (format converters) associated with the FTMI.

Where: sf = FC number consisting of side (0 or 1) and position in FTU (1 through 4).

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations for denial codes).

Restore ECCN/CCN

Restore ECCN

1. If the CCI pack was just installed in a previous procedure, enter
RST:[FRM xy,SEQ ww]:CCI s!

Where: xy = DACS II frame number (00 through ZZ)
ww = Command sequence (00 through 49)
s = Network side (0 or 1).

**NOTE:**

The two BTs (bus terminators) for the shelf are also restored with the CCI circuit pack.

2. Use one of the following commands to restore the ETSIs:

Restore all ETSIs

RST:[FRM xy,SEQ ww]:ETSI, ECCN s, ALL!

Restore ETSIs individually

RST::ETSI sqq!

Where: sqq = ETSI number consisting of Side (0 or 1)
and peripheral unit number (01 through 16).

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations for denial codes).

If the DACS II has a CCN, then proceed to the next section, *Restore CCN*.
Otherwise, proceed to the section, *Restore UC*.

Restore CCN

Overview: The restore commands in this procedure are given in the order which establishes communications within the network and enables the restoral of the next pack in the list. The CCB and TSI packs that need to be restored after a new unit is grown are listed in the growth completion message.

1. If the network interface pack (CCNI) was just installed in a previous procedure, enter **RST:[FRM xy,SEQ ww]:CCNI s!**

Where:

xy = DACS frame number (00 through ZZ)

ww = Command sequence (00 through 49)

s = Network side (0 or 1).

2. If a DSPU CCB was just installed in a previous procedure, enter **RST:[FRM xy,SEQ ww]:CCB sf!**

Where: sf = CCB number consisting of the Side (0 or 1) and position (1 through 6); for example, CCB 12 is on side 1 and is associated with Unit 2 TSIs.

3. Use one of the following commands to restore the TSIs:

Restore all TSIs in a unit

RST:[FRM xy,SEQ ww]:TSIS,CCN s,UNIT q[,CONN (a[,b[,c[,d[,e[,f]]]]))]]!

Restore all the TSIs on a side (see Note)

RST::TSIS,CCN s,ALL!

Restore TSIs individually

RST::TSI sft!

**NOTE:**

Each of the 72 TSIs are listed in the output by the From-, To-Unit ID along with results (DGN A, C, S, D and RST C or D).

- If any restore command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Where:

q = Unit number (1 through 6).

s = Side (0 or 1)

(a[,b[,c[,d[,e[,f]]]]]) = Optional, to specify the limited unit connectivity (thereby the associated TSIs)

sft = TSI number consisting of Side (0 or 1), FROM-unit (1 through 6), and TO-unit (1 through 6);
for example, TSI 013 is on Side 0 and receives data FROM unit 1 and connects TO unit 3.

Restore UC

1. Enter **RST::UNIT [q]q,UC!** to restore unit controller.

Where [q]q = Unit number (1 through 16).

⇒ NOTE:

For the CEF, the unit UC diagnostic for the restore operation runs continuity tests between the unit and the EMC.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Restore DS3U or HDS3U Common Equipment

⇒ NOTE:

This procedure is for restoring the DS3U or HDS3U common equipment. It is assumed the ECCN/CCN and unit UC has been grown and restored. See *Restore ECCN/CCN* in this section to restore ECCN/CCN.

1. Enter commands to restore FMT packs as follows:

RST:[FRM xy,SEQ ww]:UNIT [q]q,FMT 0!

RST:[FRM xy,SEQ ww]:UNIT [q]q,FMT 1!

⇒ NOTE:

For CEF, the FMT diagnostic runs continuity test with ECCN.

2. Enter commands to restore the protection and service FLIs as follows (see Note):

RST:[FRM xy,SEQ ww]:UNIT [q]q,FLI P!

RST:[FRM xy,SEQ ww]:UNIT [q]q,FLI S!

⇒ NOTE:

When you restore the protection FLI, the protection FLI will be switched into the signal path; when you restore the service FLI, the service FLI will be switched into the signal path.

- If any command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations for denial codes).

Grow MMFG [MXR (KCR-1), EMXR (KCR-5), or HMXR (KCR8)]

Overview: This command is used to enter the type specification and any operating options for the MXR being equipped. The options are for the bit error rate calculation method and threshold and for the insertion of line buildout in the transmission path to compensate for low cabling loss. Growing the MXR also grows the facility in the data base.

1. Enter the command as follows:

**GRTH:[FRM xy,SEQ ww]:UNIT [q]q,
MXR c[-d][,TYPE mnxyz][,BERM s][,BERT t][,LBO {ON|OFF}]!**

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

[q]q = Unit number (flexible bay, 1 through 16).

c = MXR number (1 through 6).

d = Optional, last MXR number of range of MXRs in same unit.

mn = Circuit pack type: MX for MXR (KCR-1), EX for EMXR (KCR-5), or HX for HMXR (KCR-8).

xyz = Type specification; see Table 3-34 .

Default is MX100 for DS3U.

Default is HX100 for HDS3U.

s = BER calculation method: s=B for bipolar violations (default), s=P for DS3 parity errors, or s=C for both methods combined (HDS3U only).

t = BER threshold, t=3 for 10^{-3} (default) or t=6 for 10^{-6} .

ON|OFF = Turns the line buildout on or off, defaults to OFF.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

2. Check output message to verify type and option entries.

3. To familiarize yourself with query outputs, enter

UTL::QRY,EQD,UNIT [q]q! and UTL::QRY,PSTATE,UNIT [q]q!
and notice the following in the output:

- In the EQD UNIT output, the subject MXR is shown as equipped. The first MXR position is for the protection MXR.
- In the PSTATE output, the MXRs are shown as UEQD, IS (in-service), or OOS. The PSTATE codes are explained in Table 3-35.

Table 3-34. MXR Type Specification

Option	Meaning
X	DS3 FRAMING FORMAT
1	M13 Format (Default)
2	C-Bit Parity Format
Y	NOT ASSIGNED (USE 0)
Z	NOT ASSIGNED (USE 0)

Table 3-35. Maintenance and Protection Keywords

Keyword	Meaning
Maintenance Status	
IS	In-Service
ISF	In-Service, but Failed and Pested
OOS	Out-Of-Service
UEQD	Unequipped
Protection Status	
SLT	Protection MMFG/FLI Selected
USLT	Protection MMFG/FLI Unselected
SALW	MMFG Is Carrying Service and Switching Is Allowed
SINH	MMFG Is Carrying Service and Switching Is Inhibited
MPALW	Manual Protection Switch Active and Auto Switchback Allowed
APALW	Auto Protection Switch Active and Auto Switchback Allowed
MPINH	Manual Protection Switch Active and Auto Switchback Inhibited
APINH	Auto Protection Switch Active and Auto Switchback Inhibited
(dashes)	Service MMFG Not Equipped
Protection Availability	
AVL	Available for Switching
NVL	Not Available for Switching
(dashes)	MMFG Not Selected for Service

Grow MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)

Overview: This command is used to establish the MIU/EMIU entity(ies) in the Unit database. The MIU/EMIU circuit packs, in conjunction with the "Enhanced DS1 Performance Monitoring" feature, provide the ANSI performance monitoring capability for T1 NPCs embedded in DS3 facilities.

1. Enter the command as follows:

GRTH:[FRM xy,SEQ ww]:UNIT [q]q,MIU c[d][,TYPE mnxyz]!

Where:

FRM = Frame

SEQ = Sequence

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

[q]q = Unit number (1 through 16)

MIU = Multiplexer Interface unit (used for both MIU/EMIU)

c,d = MIU/EMIU numbers within a unit (P, and 1 through 6)

mnxyz = MIU/EMIU type. MI100 is the only permissible type.

If the command is denied, find the reason for the denial and perform corrective action to obtain command completion. (*Command Denials* has explanations for denial codes).

Restore MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)

Overview: This command is used to restore one or a group of MIU/EMIU circuit packs in a particular DS3U. If the associated MXR/EMXR circuit packs are out of service, you may use the command in the Section, "Restore Protection MMFG and Service MMFG" to restore the entire MMFG(s). If the associated MXR/EMXRs are in service, you may use the following command to restore the MIU/EMIUs to service.

1. Enter the command as follows:

RST:[FRM xy,SEQ ww]:UNIT [q]q,MIU c[-d] [,INCL]!

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

[q]q = Unit number (1 through 16)

MIU = Multiplexer Interface unit (used for both MIU/EMIU)

c,d = MIU/EMIU numbers within a unit (P, and 1 through 6)

INCL = Keyword to restore all equipped TA-type NPCs in an MMFG

If the command is denied, find the reason for the denial and perform corrective action to obtain command completion. (Consult the *Command Denials* at the back of this volume.)

⇒ NOTE:

Failure to restore all equipped TA-type NPCs will result in denial of the whole command. This keyword will be ignored if the associated MMFG is not selected to carry service.

Restore Protection MMFG and Service MMFG

Overview: This procedure is used to change the status of the MMFG (MXR function group) and the DS3 facility to in-service. This operation invokes diagnostic tests which are reported in messages. The failure of either pack in the MMFG causes the restoral to be denied. When placed in-service, the DS3 line and component NPCs are monitored for alarm conditions; so, to avoid alarms, the DS3 signal must be looped back at the DSX-3 or a good signal must be connected through to the DACS II. The INCL keyword for the command causes all grown NPCs on the MXR to also be restored to service. These NPCs must have already been grown in the data base.

⇒ NOTE:

This procedure is for restoring the MMFG and protection MMFG. It is assumed the ECCN has been grown and restored. See *Restore ECCN/CCN* in this section to restore ECCN/CCN.

1. Enter **RST:[FRM xy,SEQ ww]:UNIT [q]q,MMFG c[-d][,INCL]!**.

Where:

- xy = DACS II frame number (00 through ZZ)
- ww = Command sequence number (00 through 49)
- [q]q = DACS II unit number (1 through 16)
- c = MMFG number (1 through 6 or P for protection)
- d = Optional, to give last MMFG of continuous range of MMFGs in unit
- INCL = Optional, for service MMFGs to cause all resident DS1 NPCs (full complement of 28) to also be restored to service. See Note.
- MMFG = Restored with only MXR grown because MIU is optional entity that may not need to be grown. If MIU is grown (1 through 6) then MIUP must be grown also.

 NOTE:

If information was not available to grow the embedded NPCs, the INCL cannot be used to restore the NPCs. The NPCs can be grown and restored when facilities are established.

- If any command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations for denial codes).

Install Circuit Packs, Grow and Restore DSPU

Install DSPI and CPU Circuit Packs

- 1. Install DSPI Card (UM29 Code) and CPU2 Card (TM778) in designated slots. See Figure 3-17.

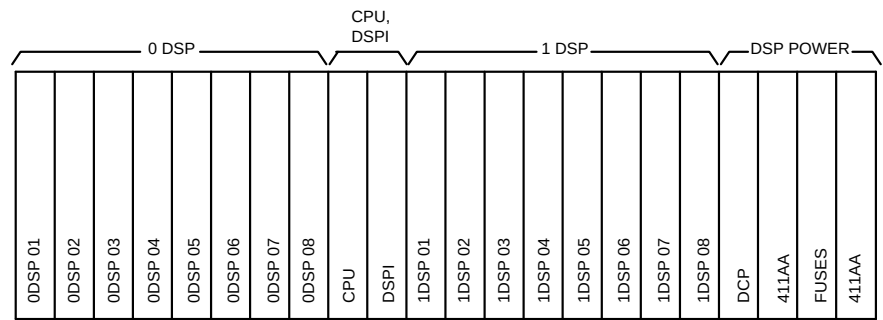


Figure 3-17. DSPU Shelf

Grow DSPU

Overview: This command is used to grow the unit in the data base and to define the type of application (DSPU). The associated ETSI, or the associated CCBs and TSIs, in the cross-connect network are grown when this command is executed as indicated in the completion message.

⇒ NOTE:

If the peripheral unit is not recorded in the software configuration file, the growth command in this procedure will be denied.

1. If you need to see the unit assignments that have been entered in the software configuration file, enter **UTL : :QRY,CNFGR!** (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the CFR FRAME program.

⇒ NOTE:

Unit designations (1 through 16, left to right) are 1 for FTU Version 1, 2 for DSPU, 3 for DS3U, 4 for FTU Version 2 (IFTU), or dash for not designated.

2. Familiarize yourself with the command

GRTH: [FRM xy, SEQ ww]:UNIT [q]q, TYPE DP100

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

[q]q = Unit number (1 through 16).

a[,b[,c[,d[,e[,f]]]]] = Optional, to limit unit connectivity to itself (a) or certain other units (b,c, etc.).

1. Enter the command with the required information.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
2. Repeat the procedure for any other units to be grown.

Restore ECCN/CCN

Restore ECCN

Use this procedure to restore an ECCN frame (for CCN see the next section).

1. If the CCI pack was just installed in a previous procedure, enter
RST:[FRM xy,SEQ ww]:CCI s!

Where: xy = DACS II frame number (00 through ZZ)
ww = Command sequence (00 through 49)
s = Network side (0 or 1).

⇒ NOTE:

The two BTs (bus terminators) for the shelf are also restored with the CCI circuit pack.

2. Use one of the following commands to restore the ETSIs:

Restore all ETSIs

RST:[FRM xy,SEQ ww]:ETSI s,ALL!

Restore individually

RST::ETSI sqq!

Where: sqq = ETSI number consisting of Side (0 or 1)
and peripheral unit number (01 through 16).

- If any restore command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
Proceed to *Restore UC and DSPI* to restore the UC and DSPI.

Restore CCN

Overview: The restore commands in this procedure are given in the order which establishes communications within the network and enables the restoral of the next pack in the list. The CCB and TSI packs that need to be restored after a new unit is grown are listed in the growth completion message.

1. If the network interface pack (CCNI) was just installed in a previous procedure, enter **RST:[FRM xy,SEQ ww]:CCNI s!**
Where s = Network side (0 or 1).
2. If a CCB was just installed (for DSPU growth) in a previous procedure, enter **RST:[FRM xy,SEQ ww]:CCB sf!**

Where: sf = CCB number consisting of the Side (0 or 1) and position (1 through 6); for example, CCB 12 is on side 1 and is associated with Unit 2 TSIs.

3. Use one of the following commands to restore the TSIs:

Restore all TSIs in a unit

**RST:[FRM xy,SEQ ww]:TSIS,CCN s,UNIT q
[,CONN (a[,b[,c[,d[,e[,f]]]]))]]!**

Restore all the TSIs on a side (see Note)

RST::TSIS,CCN s,ALL!

Restore TSIs individually

RST::TSI sft!

Where:

q = Unit number (1 through 6)

s = Side (0 or 1)

a[,b[,c[,d[,e[,f]]]]] = Optional, to specify the limited unit connectivity
(thereby the associated TSIs)

sft = TSI number consisting of Side (0 or 1), FROM-unit
(1 through 6), and TO-unit (1 through 6);
for example, TSI 013 is on Side 0 and receives data
FROM unit 1 and connects TO unit 3.

⇒ NOTE:

Each of the 72 TSIs is listed in the output by the From-, To-Unit ID
along with results (DGN A, C, S, D and RST C or D).

- If any restore command is denied, find the reason for the denial
and perform corrective action to obtain command completion
(*Command Denials* has explanations of denial codes).

Restore UC and DSPI

1. Enter **RST::UNIT [q]q,UC!** to restore unit controller

Where [q]q = Unit number (1 through 16).

⇒ NOTE:

For the CEF, the unit UC diagnostic for the restore operation runs
wiring tests between the unit and the EMC.

2. Enter **RST::UNIT [q]q,DSPI!** to restore DSPI.

NPC

Set Optional Alarm Threshold in Data Base

Overview: This procedure is used to enter (or change) values which are stored as options for facility NPC alarm thresholds. Up to three options can be entered for any of the NPC alarm parameters; these options can then be selected for an NPC via the GRTH or CHG commands. If the alarm thresholds for an NPC are not specified, the internal default values apply. Different alarm types apply to the NPCs for 2.048-M/bs Interface.

1. To see if other options have been established, enter
UTL::QRY,OPT[, {TYPE mn|ALL}],NPCS! where the options for one type or all types can be displayed. The default values are listed in the first column and any options, to the right; dashes appear if no options have been set.
2. Familiarize yourself with the command as follows and with the parameter identifiers and default values per Table 3-36 (for PA type NPCs, refer to Table 3-37):

CHG::SETOP rr,{TYPE mn|ALL},NPCOP(set1,set2,set3)!

Where:

TYPE mn|ALL = Selects all NPCs in frame or only those of specified type
 rr = Identifier for parameter to be changed per Table 3-36.
 For PA type NPCs, refer to Table 3-37.
 set1,set2,set3 = Any of three values to be stored for the parameter from the range listed in Table 3-36.
 For PA type NPCs, refer to Table 3-37.

3. See the following example which shows two values being added as options for degraded minutes (1 hour) alarm threshold.
 EXAMPLE: **CHG::SETOP 31,TYPE PB,NPCOP(50,40,-)!**
4. Enter command to set any one or all three of the options; use a dash when additional options for a parameter are not required. Remember that a minor alarm threshold must be lower than a major alarm option for the same facility parameter.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

5. Check completion message to verify changes.
6. Enter **UTL::BOOT,FRAME!** to boot in new values and prevent FRADTS messages.

Table 3-36. DE/DS/TE/PB/PC Type Setup Options

NPC Type	Option (rr)	Performance Parameter	Threshold Range	Default Value
PB/PC	31	DM, Degraded Minutes, 1 hour	1-60	60
	32	DM, Degraded Minutes, 24 hours	1-1440	1440
	33	SERS, Severely Errored Seconds, 15 minutes	1-900	900
	34	SERS, Severely Errored Seconds, 24 hours	1-65535	65535
	35	ERS, Errored Seconds, 15 minutes	1-900	900
	36	ERS, Errored Seconds, 24 hours	1-65535	65535
	37	US, Unavailable Seconds, 15 minutes	1-900	900
	38	US, Unavailable Seconds, 24 hours	1-65535	65535
	39	SLIPS, 15 minutes	1-900	900
	40	SLIPS, 24 hours	1-65535	65535

Table 3-37. PA Type Setup Options

rr	Parameter	Interval	Threshold Value Range	Default Threshold Value
11	CRC Block Errors	DAILY	1 - 79056000	176947
12	Framing Errors	DAILY	1 - 345600000	176947
13	Out of Frame Seconds	DAILY	1 - 86400	4
14	Errored Seconds	DAILY	1 - 86400	4320
15	Severely Errored Seconds	DAILY	1 - 86400	90
16	Controlled Slip Seconds	DAILY	1 - 86400	4
17	Coding Violations	DAILY	1 - 176947200	176947
18	Unavailable Seconds	DAILY	1 - 86400	90
19	Unavailable Time Count	DAILY	1 - 4320	9
20	Multiframe Errors	DAILY	1 - 86400	4095
21	Far End Block Errors	DAILY	1 - 79056000	176947
22	Far End Errored Seconds	DAILY	1 - 86400	4320
23	Far End Severely Errored Seconds	DAILY	1 - 86400	90
24	Far End Unavailable Seconds	DAILY	1 - 86400	90
81	CRC Block Errors	15MIN	1 - 823500	18432
82	Framing Errors	15MIN	1 - 3600000	18432
83	Out of Frame Seconds	15MIN	1 - 900	4
84	Errored Seconds	15MIN	1 - 900	300
85	Severely Errored Seconds	15MIN	1 - 900	30
86	Controlled Slip Seconds	15MIN	1 - 900	1
87	Coding Violations	15MIN	1 - 1843200	18432
88	Unavailable Seconds	15MIN	1 - 900	30
89	Unavailable Time Count	15MIN	1 - 45	3
90	Multiframe Errors	15MIN	1 - 900	255
91	Far End Block Errors	15MIN	1 - 823500	18432
92	Far End Errored Seconds	15MIN	1 - 900	300
93	Far End Severely Errored Seconds	15MIN	1 - 900	30
94	Far End Unavailable Seconds	15MIN	1 - 900	30

Table 3-38. DA/TA Type Setup Options

rr	Parameter	Threshold Value Range	Default Threshold Value
41	Daily Near-end Path Coding Violations	000000000 to 134217727	132960 [†]
42	Daily Near-end Path Errored Seconds	00000 to 86400	648
43	Daily Near-end Path Severely Errored Seconds	00000 to 86400	100
44	Daily Near-end Severely Errored Framing Seconds	00000 to 86400	17
45	Daily Near-end Controlled Slip Seconds	00000 to 86400	4
46	Daily Near-end Unavailable Seconds	00000 to 86400	10
47	Daily Near-end Line Coding Violations	000000000 to 134217727	133400
48	Daily Near-end Line Errored Seconds	00000 to 86400	648
49	Daily Near-end Line Severely Errored Seconds	00000 to 86400	100
50	Daily Far-end Path Coding Violations	000000000 to 134217727	132960 [†]
51	Daily Far-end Path Errored Seconds	00000 to 86400	648
52	Daily Far-end Path Severely Errored Seconds	00000 to 86400	100
53	Daily Far-end Severely Errored Framing Seconds	00000 to 86400	17
54	Daily Far-end Controlled Slip Seconds	00000 to 86400	4
55	Daily Far-end Unavailable Seconds	00000 to 86400	10
56	Daily Far-end Line Errored Seconds	00000 to 86400	648
57	15-Minute Near-end Path Coding Violations	0000000 to 2097151	13296 [‡]
58	15-Minute Near-end Path Errored Seconds	000 to 900	65
59	15-Minute Near-end Path Severely Errored Seconds	000 to 900	10
60	15-Minute Near-end Severely Errored Framing Seconds	000 to 900	2
61	15-Minute Near-end Controlled Slip Seconds	000 to 900	1
62	15-Minute Near-end Unavailable Seconds	000 to 900	10
63	15-Minute Near-end Line Coding Violations	0000000 to 2097151	13340
64	15-Minute Near-end Line Errored Seconds	000 to 900	65
65	15-Minute Near-end Line Severely Errored Seconds	000 to 900	10
66	15-Minute Far-end Path Coding Violations	0000000 to 2097151	13296 [‡]
67	15-Minute Far-end Path Errored Seconds	000 to 900	65
68	15-Minute Far-end Path Severely Errored Seconds	000 to 900	10
69	15-Minute Far-end Severely Errored Framing Seconds	000 to 900	2
70	15-Minute Far-end Controlled Slip Seconds	000 to 900	1
71	15-Minute Far-end Unavailable Seconds	000 to 900	10
72	15-Minute Far-end Line Errored Seconds	000 to 900	65

[†] The value shown applies to ESF framing and is a count of CRC errors. When the DS1 has D4 or T1DM framing, framing errors are counted and the default Daily value is 691.

[‡] The value shown applies to ESF framing and is a count of CRC errors. When the DS1 has D4 or T1DM framing, framing errors are counted and the default 15-Minute value is 72.

Install Circuit Packs, Grow and Restore IFTU2 NPC

Install Circuit Packs and Grow Type PB/PC NPC

Overview: This procedure is used to enter information (grow) into the data base to provision the PBC (primary block circuit). Entered are the line interface impedance, the mode NSA (nonsignaling associated) or CAS (channel associated signaling), and selection of line signal format options. These format options include assigning alarm meanings to transitions of bits 3, 4 and 5 of time slot 0 (TS0). The NPC also monitors the following facility parameters: slips, errored seconds, severely errored seconds, degraded minutes, and unavailable seconds. The alarm thresholds for any or all of these can be specified by listing the parameter and threshold option in the command. The IW (insertion word), which is sent by the NPC on any not-connected channels or on all channels when the NPC is removed from service, can be specified in this command.

⇒ NOTE:

Only bits a through g (for xy values) can be used for NPC provisioning with the basic 2.048-Mb/s Interface software feature. The remaining bits are used with the Enhanced 2.048-Mb/s Interface feature to assign alarm meanings to TS0 bits. The TG187 pack is needed for growth option jkl = 011 or 101 to provide MBER (minor bit error rate) operation.

1. Install the appropriate circuit pack cards in the NPC slots to be equipped from the following list: TG182 - 120 ohms, TG185 - 75 ohms, TG187 - 120 ohms, or TG192 - 75/120 ohms for minor error rate.
2. Familiarize yourself with the command as follows:
**GRTH::NPC <npc No.>[-<range>],TYPE mnxyz
 [,OPTS(rr/l,ss/m...,tt/n)][,AIS {MI|PMA|DMA}][,IW X'pw[r]]!**

Where:

<npc No.> = NPC number, either extended (for example, [0]001)
 or hierarchical (for example, 01101).

- <range> = Optional, last NPC of continuous range of NPCs.
- mn = NPC type, **PB** for 120-ohm line interface or **PC** for 75-ohm coaxial line interface.
- xyz = 3-digit hexadecimal number; each digit corresponds to a 4-bit binary number, the bits of which represent NPC options per Table 3-39. Only bits a through g are for Basic 2.048-Mb/s Interface. The default type specification for 2.048-Mb/s Interface frame is PB100.
- rr/l ...,tt/n = Optional, to list any one or all facility parameters (31-40) per Table 3-40 and predefined number (0 through C) per Table 3-41 which selects alarm threshold. See examples in Step 3.
- AIS field = Optional, to specify class of output message issued when AIS is received: MI (information, default), PMA (prompt maintenance), or DMA (deferred maintenance).
- IW X'pw[r] = Insertion word given as hexadecimal code; each digit specifies 4 bits. The r-digit is for disconnect channel signaling. Default for 2.048-Mb/s Interface is X-D5D.

3. Notice the following examples which show the command to select TYPE options, no CRC-4, no sync source, consequent AIS, CAS, and telephone channel numbering, and specifies different deferred alarm threshold for 1-hour DM and 15-minute SLIP.

EXAMPLE 1: GRTH::NPC 01112,TYPE PB900,OPTS(31/3,39/3)!

EXAMPLE 2: GRTH::NPC 02132,TYPE PB87C! (for TRANSMIC 1G)

⇒ NOTE:

Bit c of "x" (xyz field) selects the use of the <tc> field and, for Enhanced 2.048-Mb/s Interface, determines the alarm network timer as follows: c = 0 for 144 ms and c = 1 for 480 ms for local alarms. The c = 1 selection is required to specify <tc> for a DS1 connection (gateway).

4. Enter command with required TYPE options. If default alarm thresholds are appropriate for the NPC application, the OPTS field can be omitted from the command. To disable any facility alarms, enter "C" for the value of "m" in the "rr/l ...,tt/n" field.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
5. Check output message to verify type and option selections. Also notice the TS0 and TS0M output fields which give the default values for the spare TS0 bits and bits monitored.

Table 3-39. Hexadecimal/Binary Numbers

Hex	Bit	Value	Meaning
x	a	0	CRC-4 multiframe in TS0
		1	Non-CRC-4 framing in TS0
	b	0	NPC is not used as a synchronization source
		1	NPC is used as a synchronization source
y	c	0	CCITT G.732 Consequent AIS in signaling
		1	Specified consequent action; <tc> field in commands
	d	0	Nonsignaling associated (NSA)
		1	16-state channel associated signaling (CAS)
z	e	0	Telephone Channel Numbering
		1	Time Slot Channel Numbering (NSA)
	f	0	Convert the abcd bits of TS16 to 1111 if 0000
		1	Pass signaling bits through unchanged
m	g	0	AIS applied to receive TS16 upon RAI, RAIS, or R16
		1	AIS not applied to receive TS16 upon RAI, RAIS, or R16
	h	0	TS0 bit 5 = SFI unaffected by synchronizer holdover
		1	TS0 bit 5 = SFI inverted on synchronizer holdover
z	jkl	000	TS0 bit 3 = RAI indication within 2 ms.
		001	TS0 bit 3 = RAI indication in t^*
		010	TS0 bit 4 = RAIS in t^* and RAI within 2 ms.*
		011	TS0 bit 4 = Detect BER, enable RBER in t^* and RAI in 2 ms.
		100	TS0 bit 4 = RAIS and RAI in t^* (Transmic 2G)*
		101	TS0 bit 4 = Detect BER, disable RBER and RAI within 2 ms*
		110	Bits 3 through 8 in t^* (Transmic 1G)
		111	Unassigned
m	m	0	Unassigned, only m = 0 is valid

* When bit c=0, time t is 144 ms; when bit c=1, t is 144 ms for remote alarms, but t is 480 ms for local alarms except for jkl = 011 or 101 (MBER selected). With MBER, t is 2496 ms (SFDT).

Reference: HEX A=1010, B=1011, C=1100, D=1101, E=1110, F=1111.

Table 3-40. Facility Parameter

Type (rr,ss,tt)	Meaning
31	DM, 1 Hour
32	DM, 24 Hour
33	SERS, 15 Minute
34	SERS, 24 Hour
35	ERS, 15 Minute
36	ERS, 24 Hour
37	US, 15 Minute
38	US, 24 Hour
39	SLIPs, 15 Minute
40	SLIPs, 24 Hour

Table 3-41. Alarms Option

Alarm Class	Option 0 (Default)	Option 1	Option 2	Option 3*
MI (Info)	0	3	6	9
DMA (Deferred)	1	4	7	A
PMA (Prompt)	2	5	8	B

* Only valid option for PB/PC types.

Note: C - disables monitoring of a facility parameter

Install Circuit Packs and Grow Type PA NPC

Overview: This procedure is used to enter information (grow) into the database to provision the NPC as a type PA. This allows the enhanced facility monitoring feature to be used (refer to *Performance Monitoring*). The facility monitoring feature is also supported with type PA NPCs.

1. Install the TG192 circuit pack in the NPC slot.
2. Familiarize yourself with the command as follows:

```
GRTH::NPC <npc No.> [-<range>],TYPE mnxyz\  
[,OPTS(rr/m[,rr/m][...])][,IX X'pq[,INCL][,AIS {MI|DMA|PMA}]]
```

Where:

<npc No.> = NPC number.

<range> = Optional, last NPC of continuous range of NPCs.

mn = NPC type PA.

xyz = NPC type identifier. The following tables contain identifier definitions. A Y in a column of the table indicates that the feature at the top of the column is enabled by the corresponding x, y, or z provisioning value.

x Value	CRC-4 Mode	Automatic CRC-4	Far-End PM	NPC Used as Sync Sourc	TS0 Bit 5 Used for SFI
0	Y				
1	Y		Y		Y
2	Y				Y
3	Y		Y		
4	Y			Y	
5	Y		Y	Y	Y
6	Y			Y	Y
7	Y		Y	Y	
8		Y	Y		
9		Y	Y		Y
A					Y
B					
C		Y	Y	Y	
D		Y	Y	Y	Y
E				Y	Y
F				Y	

NOTE: Although a value of B does not enable any of the features shown in the table, it is a valid value for x.

y Value	CAS Mode	NSA Mode	Telephone Numbering	Timeslot Numbering	Convert CTS 16	AIS in CTS 16	Framed Clear	Unframed Clear
0	Y		Y		Y	Y		
2	Y		Y		Y			
4	Y		Y			Y		
6	Y		Y					
8		Y	Y					
9		Y		Y				
C							Y	
D								Y

NOTE: Values 1, 3, 5, 7, A, B, E, and F are unassigned and not valid.

z Value	C.A. Timing		RAI Set Time			NFW Bit 4 Use		RAIS Set Time		MBER Enabled
	HW	FW	2ms	144ms	480ms	RAIS	RBER	144ms	480ms	
0	Y		Y							
1		Y	Y							
2	Y			Y						
3		Y			Y					
4	Y		Y			Y		Y		
5		Y	Y			Y			Y	
6	Y		Y				Y			Y
7		Y	Y				Y			Y
8	Y			Y		Y		Y		
9		Y			Y	Y			Y	
A	Y		Y							Y
B		Y	Y							Y
C	Y									

NOTE: Values D, E, and F are unassigned and not valid.

rr = Facility performance parameter number. The following table contains valid values.

rr	Parameter
11	Daily CRC Block Errors
12	Daily Framing Errors
13	Daily Out-of-Frame Seconds
14	Daily Errored Seconds
15	Daily Severely Errored Seconds
16	Daily Controlled Slip Seconds
17	Daily Coding Violations
18	Daily Unavailable Seconds
19	Daily Unavailable Time Count
20	Daily Multiframe Errors
21	Daily Far-End Block Errors
22	Daily Far-End Errored Seconds
23	Daily Far-End Severely Errored Seconds
24	Daily Far-End Unavailable Seconds
81	15-Minute CRC Block Errors
82	15-Minute Framing Errors
83	15-Minute Out-of-Frame Seconds
84	15-Minute Errored Seconds
85	15-Minute Severely Errored Seconds
86	15-Minute Controlled Slip Seconds
87	15-Minute Coding Violations
88	15-Minute Unavailable Seconds
89	15-Minute Unavailable Time Count
90	15-Minute Multiframe Errors
91	15-Minute Far-End Block Errors
92	15-Minute Far-End Errored Seconds
93	15-Minute Far-End Severely Errored Seconds
94	15-Minute Far-End Unavailable Seconds

m = Facility performance threshold index (0 through 3).

IW = Insertion word.

INCL = Inclusive.

AIS = Alarm Indication Signal.

MI = Maintenance information.

DMA = Deferred action.

PMA = Prompt action.

PL = Payload loopback

ENA = Enabled

DSA = Disabled

3. Enter command with required TYPE options. If default alarm thresholds are appropriate, the OPTS field can be omitted from the command.
4. Check the output message to verify type and option selections.
5. When the PL field is not specified, the default is payload loopback enabled.

Install Circuit Packs and Grow Type TH NPC

Overview: This procedure is used to enter information (grow) into the database to provision the NPC as a type TH.

1. Familiarize yourself with the command as follows:

```
GRTH::NPC <npc No.> [-<range>], TYPE mnxyz[, OPTS(rr/m[, rr/m]\
[...])] [, IW X'pq[, INCL][, AIS {MI|DMA|PMA}]
```

Where:

<npc No.> = NPC number.

<range> = Optional, last NPC of continuous range of NPCs.

mn = NPC type TH.

xyz = NPC type identifier. The following tables contain identifier definitions. A Y in a column of the table indicates that the feature at the top of the column is enabled by the corresponding x, y, or z provisioning value.

x Value	CRC-4 Mode	Automatic CRC-4
0	Y	
8		Y
B		

NOTE: Although a value of B does not enable any of the features shown in the table, it is a valid value for x. The values 0, 8, and B are the only valid values for x.

y Value	CAS Mode	NSA Mode	Telephone Numbering	Timeslot Numbering	Convert CTS 16	AIS in CTS 16	Framed Clear	Unframed Clear
0	Y		Y		Y	Y		
2	Y		Y		Y			
4	Y		Y			Y		
6	Y		Y					
8		Y	Y					
9		Y		Y				
C							Y	
D								Y

NOTE: Values 1, 3, 5, 7, A, B, E, and F are unassigned and not valid.

z Value	C.A. Timing		RAI Set Time			NFW Bit 4 Use		RAIS Set Time		MBER Enabled
	HW	FW	2ms	166ms	500ms	RAIS	RBER	166ms	500ms	
0	Y		Y							
1		Y	Y							
2	Y			Y						
3		Y			Y					
4	Y		Y			Y		Y		
5		Y	Y			Y			Y	
6	Y		Y				Y			Y
7		Y	Y				Y			Y
A	Y		Y							Y
B		Y	Y							Y

NOTE: Values 8, 9, D, E, and F are unassigned and not valid.

rr = Facility performance parameter number. The following table contains valid values.

rr	Parameter
11	Daily CRC Block Errors
12	Daily Framing Errors
13	Daily Out-of-Frame Seconds
14	Daily Errored Seconds
15	Daily Severely Errored Seconds
16	Daily Controlled Slip Seconds
18	Daily Unavailable Seconds
19	Daily Unavailable Time Count
20	Daily Multiframe Errors
81	15-Minute CRC Block Errors
82	15-Minute Framing Errors
83	15-Minute Out-of-Frame Seconds
84	15-Minute Errored Seconds
85	15-Minute Severely Errored Seconds
86	15-Minute Controlled Slip Seconds
88	15-Minute Unavailable Seconds
89	15-Minute Unavailable Time Count
90	15-Minute Multiframe Errors

m = Facility performance threshold index (0 through 3).

IW = Insertion word.

INCL = Inclusive.

AIS = Alarm Indication Signal.

MI = Maintenance information.

DMA = Deferred action.

PMA = Prompt action.

PL = Payload loopback

ENA = Enabled

DSA = Disabled

2. Enter command with required TYPE options. If default alarm thresholds are appropriate, the OPTS field can be omitted from the command.
3. Check the output message to verify type and option selections.
4. When the PL field is not specified, the default is payload loopback enabled.

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Establish NPC Test Ports and Groups**Establish Test Access Facility****Dual Primary Card/Enhanced Dual Primary Card
Monitor Jacks**

The TG182 provides two 120 Ohm E1 line terminations. The TG182 provides two transmit line monitor points, one for each NPC. The jack layout for the TG182 is shown in Figure 4-1. These monitor points are attenuated by 30 dB from the signal level at the interface.

The TG185 provides two 75 Ohm E1 line terminations. The TG185 provides two transmit line monitor points, one for each NPC. The jack layout for the TG185 is shown in Figure 4-1. These monitor points are attenuated by 26 dB from the signal level at the interface.

The TG187 provides two 120 Ohm line terminations. The TG187 provides two transmit line monitor points, one for each NPC. The jack layout for the TG187 is shown in Figure 4-1. These monitor points are attenuated by 30 dB from the signal level at the interface.

The TG192 provides two software selectable 75 or 120 Ohm E1 line terminations. The TG192 provides monitor points for both the receive and transmit interfaces for both NPCs. The monitor jack layout for the TG192 is shown in Figure 4-2. These monitor points are attenuated by slightly different levels depending on the line impedance selected. These attenuation values are:

Selected Impedance	Attenuation

75 Ohms 23.75 dB

120 Ohms 20 dB

**NOTE:**

Special test equipment must be used to compensate for the attenuation loss.

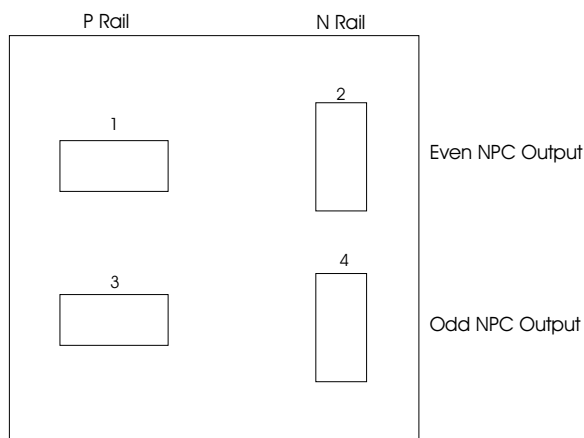


Figure 4-1. TG182, TG185, and TG187 Monitor Jack Layout

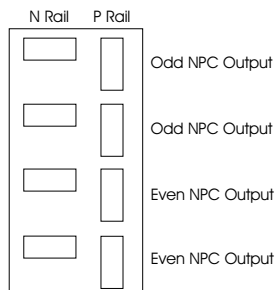


Figure 4-2. TG192 Monitor Jack Layout

Make Cross-Connections at the Line Interface Bay

1. Verify that connecting equipment (voice channel bank or digital test) has been tested.
2. Use office records to determine the DACS II and line interface jack appearances to be cross-connected.
3. Make wiring cross-connections at line interface bay.

Install Plug-Ins, Grow and Restore NPC to Function as NPCTP or NPCTG

Overview: This procedure defines the operating characteristics of the NPC in the data base. When the NPC is subsequently restored to service, it will be provisioned per the growth specification. Included in the specification are: line and channel formats, facility alarm thresholds, and the channel insertion word. The line formats are given by the TYPE specification; TYPE PB100 is the default. If used, alarm threshold options must already be defined in the data base.

1. Install a TG182 for 120 ohm application or TG185 for 75 ohm application, or TG192 for 75/120 ohm application. Each Dual Primary Card will support two NPCs to be used as TAPs (test access primaries).
2. Before you enter the command, familiarize yourself with command as follows:

GRTH: :NPC <npc No.>[-<range>],TYPE PBxyz !

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

xyz = Line and channel format specification; PB100 (default).

⇒ **NOTE:**

In the TYPE field, making x=1 sets the CAS option which is required to test CAS primaries.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. Check output message to verify type and option selections.
4. Enter **RST:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>]!**

Where:

- xy = DACS II frame number (00 through ZZ).
- ww = Command sequence number (00 through 49).
- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).
- <range> = Optional, to name the final NPC when it is desired to restore a continuous range of FTU-NPCs.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Designate NPC as NPCTP

1. Enter : **GRTH::NPC <npc No.>,NPCTP n!**
Where: n = 1 through 8.
2. Notice the associated TPs that can now be grown.

Designate NPC as NPCTG

1. Enter : **GRTH::NPC <npc No.>,NPCTG rrr!**
Where: rrr = 1 through 400.

Grow Test Ports

Overview: This procedure is used to grow test ports on a TAP (test access primary). Up to eight NPCs can be so designated on the frame, providing up to 96 test ports, 12 on each NPCTP. Test access NPCs must be grown with the CAS option to access circuits with signaling. As each test port is grown, two more channels from the NPC are assigned a test port number. During subsequent test access, the channels of the test port are cross-connected to the channel under test. Splitting access is achieved by having two channels per test port.

1. Consider the following information concerning the variables used in the command:
 - The trunk conditioning (tc) is programmed signaling and a message insertion word that is sent on the connecting carrier channel during a carrier failure.
 - The <tc> specification is used when static "tc" is needed for an analog test system (SARTS/RTS-5A in the USA); otherwise, the "tc" will be dynamic (that is, match what was specified for the cross-connection).
 - Twelve test ports are available on each designated NPCTP and up to eight NPCTPs can be designated. The test port numbering is kk = 01-12 on NPCTP 1, 13-24 on NPCTP 2, 25-36 on NPCTP 3, 37-48 on NPCTP 4, 49-60 on NPCTP 5, 61-72 on NPCTP 6, 72-84 on NPCTP 7, and 85-96 on NPCTP 8.
 - If trunk conditioning is required for static test ports, see the format of the "tc" field.

2. Enter **GRTH:[FRM xy,SEQ ww]:TP kk[,<tc>]!**

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

kk = Test port number (01 through 96) on test access primary

tc = Optional, used for Static Trunk Conditioning.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Grow Test Groups

Overview: This procedure is used to grow test groups on a TAP (test access primary). Up to 400 test groups can be established. Each test group consists of two Nx64 Kbit/s bundles for testing both directions, where N is the width of the bundles and may be from 1 to 31. The bundles, called east and west, can be on separate NPCs or on the same NPC, if bandwidth permits. Test access NPCs must be grown with the CAS option to access circuits with signaling. During subsequent test access, the channels of the test group are cross-connected to the channels under test.

1. Consider the following information concerning the variables used in the command:
 - The trunk conditioning (tc) is programmed signaling and a message insertion word that is sent on the connecting carrier channel during a carrier failure.
 - The <tc> specification is used when static "tc" is needed for an analog test system (SARTS/RTS-5A in the USA) when testing unmapped channel(s). Otherwise, the "tc" will be dynamic (that is, match what was specified for the cross-connection).
 - Each test group consists of two equal ranges having a width of up to 31 channels, for DS1. The two ranges may belong to two NPCTGs, or the same NPCTG but not overlapping.
 - If trunk conditioning is required for static test ports, see the format of the "tc" field.

2. Enter

```
GRTH::TG mmm,NPCTG (rrr,eee[-fff];\  
sss,www[-xxx])[,<tc>]!
```

Where:

mmm = Test group number

rrr = NPCTG number

eee[-fff] = [Range of] channels of east bundle on NPCTG rrr

sss = NPCTG number

www[-xxx] = [Range of] channels of west bundle on NPCTG sss

tc = Optional, used for Static Trunk Conditioning.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Establish Test Connection

Cross-Connect 64-kb/s Signals to Testing Facilities

Connect Hubbed Testport(s) to Local DACS II

Overview: The HUB command in this procedure is used at a DACS II frame which serves as the interface between a mechanized test system and the other DACS II frames in the complex. The HUB command connects a pair of test port channels from the interface (concentrator DACS II frame) to test port channels on one of the other frames in the complex.

1. To establish a test port-to-test port connection, enter

TTST:[FRM xy,SEQ ww]:HUB,[<tc>],TO <npc No.>jjj,TP kk!

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<npc No.> = NPC number on concentrator frame that terminates line to other frame. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

jjj = Lower channel of pair going to test port group on another frame. The connecting test port group NPC must be the same type.

kk = Testport number (01 through 96) on concentrator DACS II.

<tc> = Trunk conditioning. This field should not be specified for a 2.048 Mb/s Test Port unless the NPC termination specified in the command belongs to a 1.544 Mb/s circuit.

⇒ NOTE:

If both terminations are 2.048 Mb/s type framing, <tc> will default to 16-state signaling with all ones and an insertion word of all ones.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

2. Check completion message for additional information. The presence of T or P in the first explanation line of the output message indicates a facility failure on that side or on the test port (P) NPC; zeros in the PBA field indicate no such failure.

3. To release a test port-to-test port connection, enter

TTST:[FRM xy,SEQ ww]:TPR,TP kk[,OOS]!

Where:

OOS = Optional, to allow releasing connection when any of the involved NPCs are out-of-service.

Looping Back a Test Port

DACS II provides a loopback test access command to loop back the two channels of a specified Test Port. Looping back a Test Port is useful for testing the connection between the DACS II Test Port and the external test equipment. When a loopback test access command is executed, each of the two 64 kbit/s channels of the Test Port is individually looped back on itself so that the signal received from the facility side is returned to the facility.

The loopback is released using a Test Port release command.

To loop back a DS0 Test Port, enter the following command:

TTST::LPD,TP kk[,<tc>]

Where:

LPD = Looped

TP = Test Port

kk = Test Port number (01 through 96) to loop back.

tc = Trunk Conditioning. The need to specify a value depends on the type of Test Port that is being looped back.

Trunk conditioning must be specified in this command only when looping back a dynamic Test Port. If it is not specified for a dynamic Test Port, the command will be denied. A dynamic Test Port is defined as a Test Port in which trunk conditioning was not specified when the Test Port was provisioned.

Although it is not required, trunk conditioning may be specified in this command to loop a static Test Port. A static Test Port is defined as a Test Port in which trunk conditioning was specified when the Test Port was provisioned. If trunk conditioning is specified in this command, it will be used. If it is not specified for a static Test Port in this command, the Test Port's trunk conditioning value will be used.

Connect Testport to Circuit

Overview: In order to test channels with signaling, the NPC designated for test access must be provisioned for CAS. The test access NPC also performs the necessary signal conversions to allow testing DS1 circuits in a Gateway application. Generally, DACS II test access adopts the characteristics of the accessed circuit; but for unmapped terminations, the DACS II cannot determine the need for signal conversions either because there is no connection or existing conversion. For these connections, the user must determine whether the NAM keyword is required in the command.

1. Enter **UTL : :QRY,TPS!** to see which test ports are grown and available (TPR alongside test port number in output message).
2. Familiarize yourself with the monitor command as follows:

TTST:[FRM xy,SEQ ww]:MON,TO <npc No.>jjj[,<tc>],TP kk[,NAM]!

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<npc No.> = NPC number of termination to be tested.

Conference legs must be accessed by entering one of the FTU/DS3U legs in the command. For 1-way circuits, the TO-side entered in the OCON must be entered here.

jjj = Channel to be accessed; can be part of cross-connected circuit or unmapped termination.

tc = Allows entering <tc> for test access to unmapped termination; if not entered, the <tc> of GRTH TP command will be used for access to unmapped termination.

kk = Testport number (01 through 96).

NAM = Optional for gateway to disable A-law to μ -law signal conversion at test access NPC. Needed to test digital data circuits (where there is no encoding) at unmapped terminations.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. If you need to know the test access channel numbers associated with the test port numbers, refer to Table 4-1.

Table 4-1. Test Access Channels

Test Access Port	Telephone Channel	
	From	To
01,13,25,37,49,61,73,85	5	6
02,14,26,38,50,62,74,86	7	8
03,15,27,39,51,63,75,87	9	10
04,16,28,40,52,64,76,88	11	12
05,17,29,41,53,65,77,89	13	14
06,18,30,42,54,66,78,90	16	17
07,19,31,43,55,67,79,91	18	19
08,20,32,44,56,68,80,92	20	21
09,21,33,45,57,69,81,93	22	23
10,22,34,46,58,70,82,94	24	25
11,23,35,47,59,71,83,95	26	27
12,24,36,48,60,72,84,96	28	29

4. If you are going to use the <tc> field in the command, consider the following:
 - Table 4-1 gives the channel numbers associated with the test ports on the test access primary; channel time slots 15 and 16 (telephone channels 15 and 31) are not used for test access because of the possible interaction with CAS signaling (TS16).
 - When a mapped circuit is accessed, whatever <tc> is entered here will be overwritten by the <tc> of the mapped circuit.
 - When an unmapped circuit is accessed, whatever <tc> is entered here will overwrite the <tc> that was specified in the GRTH TP command.
 - Access to an unmapped circuit will be denied if the <tc> is not entered here or was not entered in the GRTH TP command.
5. Enter the command with the required information. For 1-way circuits, the TO side entered in the OCON must be entered here.
 - If the CONN ...COMPL message is not received, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes)..

6. Note the meanings of the following possible output message keywords:
 - Signaling (SG) type field - T for transparent, R for robbed bit, and C for CAS.
 - The next three positions are for primary block alarms, either the alarmed side (F, T, or P for test port NPC) or 0s for no alarms.
 - The next field is the termination state of the circuit, either the terminated side (F, T, or Both) or R (released/not terminated).
 - RDC indicates red, special service circuit.
 - CUS indicates customer control of channel.
 - ONEWAY indicates one-way circuit accessed.
7. To split the circuit for transmission or signaling tests, enter:
TTST: :SPL, TP kk!
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
8. At this point, you can run tests from the local test panel or test position.

Release Test Port

1. When testing is completed, release test access by entering,
TTST: :TPR, TP kk!.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Establish Test Group Connection (Nx64 Kbit/s)

Connect Test Group to Circuit

Overview: This procedure gives the command and considerations for establishing test access to a range of 64 Kbit/s channels. This initial access is a bridged connection to allow monitoring the circuit for service before it is split for testing. Generally, DACS II test access adopts the characteristics of the accessed circuit, but, for unmapped terminations, there is a trunk conditioning option in the command.

1. Enter **UTL::QRY, TGS mmm[-nnn]!** to see information on a TG or a range of TGs. For each TG queried, the NPCTG/NPC number and starting channel number for the east and west bundles are provided along with the TG width and mode.

Due to the potentially large number of NPCTGs and TGs, enter **UTL::QRY,NPCTG rrr[-sss]!** to query an NPCTG or a range of NPCTGs.

2. Familiarize yourself with the monitor command as follows:

TTST::MON,TO <npc No.> (jjj[-kkk][,lll,...])[,<tc>],TG mmm!

Where:

mmm = Test group number

<npc No.> = NPC number of termination to be tested.

Conference legs must be accessed by entering one of the FTU/DS3U legs in the command. For 1-way circuits, the TO-side entered in the OCON must be entered here.

jjj,kkk,lll = List or range of channels
(Number of channels must match width of TG)

tc = Allows entering <tc> for test access to unmapped termination; if not entered, the <tc> of GRTH TG command will be used for access to unmapped termination.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. If you are going to use the <tc> field in the command, consider the following:
 - When a mapped circuit is accessed, whatever <tc> is entered here will be overwritten by the <tc> of the mapped circuit.
 - When an unmapped circuit is accessed, whatever <tc> is entered here will overwrite the <tc> that was specified in the GRTH TG command.
 - Access to an unmapped circuit will be denied if the <tc> is not entered here and was not entered in the GRTH TG command.
4. Enter the command with the required information. For 1-way circuits, the TO side entered in the OCON must be entered here.
 - If the CONN ...COMPL message is not received, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes)..
5. Note the meanings of the following possible output message keywords:
 - Signaling (SG) type field - T for transparent, R for robbed bit, and C for CAS.
 - The next three positions are for carrier group alarms, either the alarmed side (F, T, or P for test group NPC) or 0s for no alarms.
 - The next field is the termination state of the circuit, either the terminated side (F, T, or Both) or R (released/not terminated).
 - RDC indicates red, special service circuit.
 - CUS indicates customer control of channel.
 - ONEWAY indicates one-way circuit accessed.
 - BCAST indicates BCON circuit accessed.
 - UMPD indicates unmapped circuit accessed.

6. To split the circuit for transmission or signaling tests, enter:

TTST: :SPL, TG mmm!



NOTE:

If the TG is connected to an unmapped Nx64 Kbit/s termination, this command connects both directions of the unmapped termination to the TG's west bundle.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

7. At this point, you can run tests from the local test panel or test position.
8. To change the mode of a TG currently in split mode to monitor mode, enter **TTST: :MON, TG mmm!**

Change Circuit Termination State (TLA/TLR)

Overview: This procedure gives the commands for modifying the terminate and leave active (TLA) and terminate and leave released (TLR) states of one or both ends of a Nx64 Kbit/s cross-connection associated with a TG. In the terminated state, the normal transmitted data on the circuit is replaced by the signal pattern according to the circuit's trunk conditioning code, as specified when the cross-connection was set up. In the released state, a terminated circuit is released and normal data transmission is restored in the specified transmission.

⇒ NOTE:

The Nx64 Kbit/s circuit must be a mapped one-way or two-way circuit currently under monitor or split test modes, and unterminated to modify the TLA states or terminated to modify the TLR states.

1. To modify the terminate and leave active states, enter:

TTST::TLA {F|T|B},TG mmm!

mmm = TG number

F|T|B = Direction of circuit to be terminated:

F = terminated toward the FROM side

T = terminated toward the TO side

B = BOTH sides are terminated

2. To modify the terminate and leave release states, enter:

TTST::TLR {F|T|B},TG mmm!

mmm = TG number

F|T|B = Direction of circuit to be released:

F = released toward the FROM side

T = released toward the TO side

B = BOTH sides are released

Connect Test Group in HUB Mode

Overview: This procedure gives the command to set up an Nx64 Kbit/s HUB test access connection via a TG, to a Nx64 Kbit/s TO termination consisting of two Nx64 Kbit/s bundles connected to the TG's east and west bundles. The number of channels in each bundle is the same as the TG's width; and the starting channels are indicated by the TO termination.

1. Enter **TTST::HUB,TO (uvmnpddd,wxkqrjjj),TG mmm[,<tc>]!**

Where:

uvmnp = 1st TO NPC number

wxkqr = 2nd TO NPC number

ddd = Starting channel number of 1st TO NPC

jjj = Starting channel number of 2nd TO NPC

Connect Test Group in LOOPED Mode

DACS II provides a loopback test access command to place both bundles of a test-access group (TG) in the looped mode.

The loopback is released using a Test Port release command.

To loop back a bundles of a TG, enter the following command:

TTST::LPD,TG mmm[,<tc>]

Where:

LPD = Looped

TG = Test Group

mmm = Test Group number (001 through 400) to loop back.

tc = Trunk Conditioning. If the static trunk conditioning was not furnished in the growth TG command, it must be dynamically specified in this command or the test access will be denied. A dynamic tc will override any static tc.

Release and Degrow Test Group

Overview: This procedure gives the commands to release one or a range of currently active TGs, degrow a TG, and degrow an NPCTG. When a TG is released, any circuit under test is restored to its normal, terminated, or unmapped state.

1. If testing is complete, release the test group(s) by entering:

TTST : :TGR, TG mmm[-nnn][, OOS] !

The OOS keyword must be used if any NPC involved is out of service. This TG is now available to test other circuits or may be degrown.

2. To degrow a TG or a range of TGs, enter:

DGRTH : :TG mmm[-nnn] !

If the range mmm-nnn includes some undesignated TG numbers, these numbers will be skipped. The output message will indicate degrown and skipped TGs appropriately.

3. To degrow an NPCTG, enter:

DGRTH : :NPC <npc No.>, NPCTG rrr[, TGR] !

It is required that all TGs associated with this NPCTG be released before the NPCTG can be degrown. If TGR is specified, all active TGs will be released and degrown before the NPCTG is degrown; and any out-of-service (OOS) condition will be bypassed (i.e., TG will be released as if the OOS keyword was entered above).

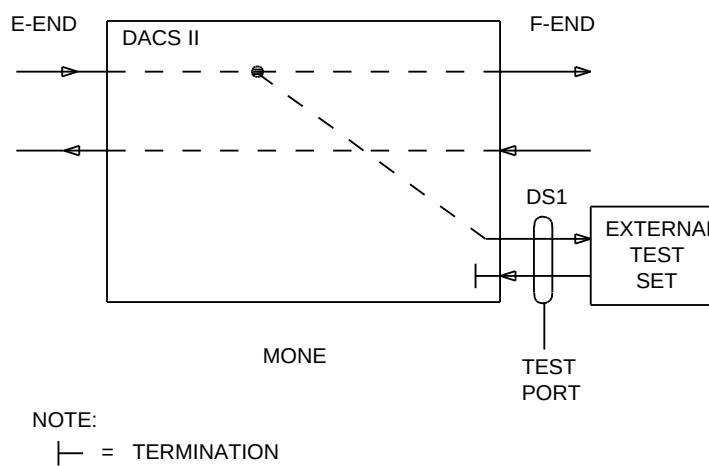
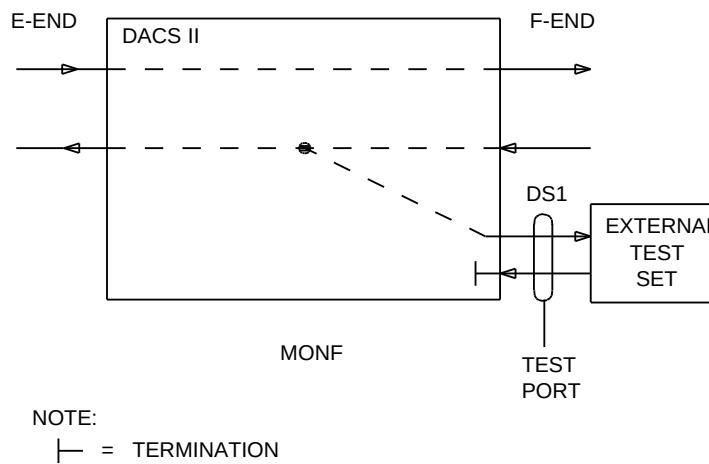
Clear-2 Mbit/s Test Access

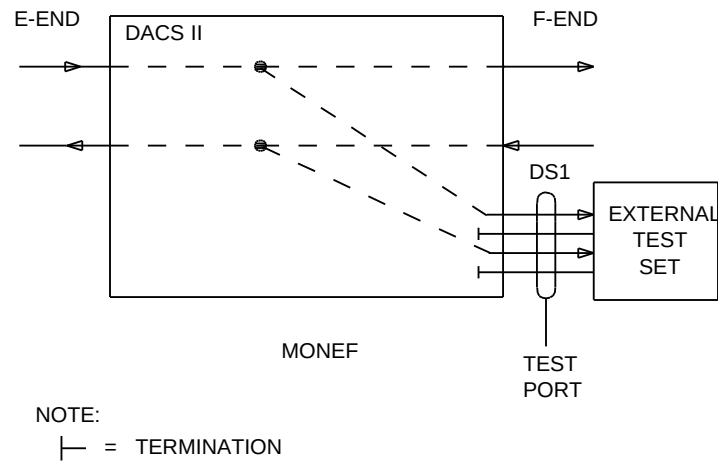
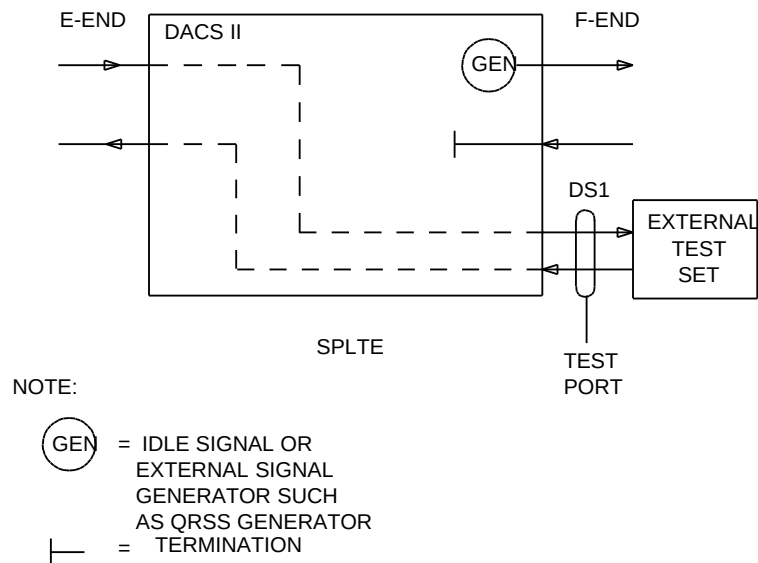
DACS II clear-2 Mbit/s test access provides monitor, split, and loopback test access on clear-2 Mbit/s signals. Each type of test access has these configurations, testing one or both directions, or one or both sides of a 2 Mbit/s circuit. In addition, test primary loopback and hub are also supported. Different configurations of test access are shown in Figures 4-3 through 4-16.

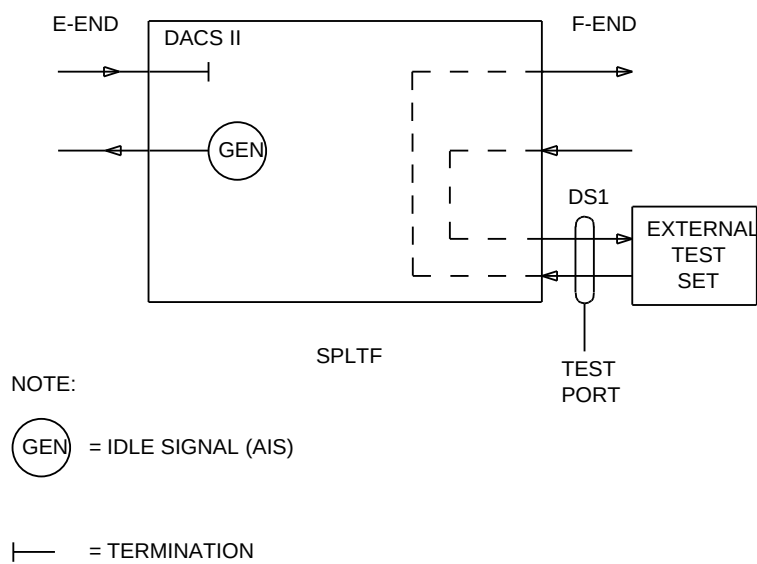
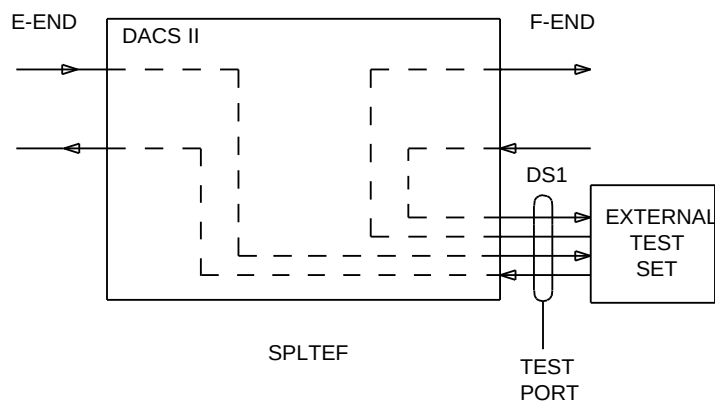
Table 4-2. Clear-2 Mbit/s Test Access Modes

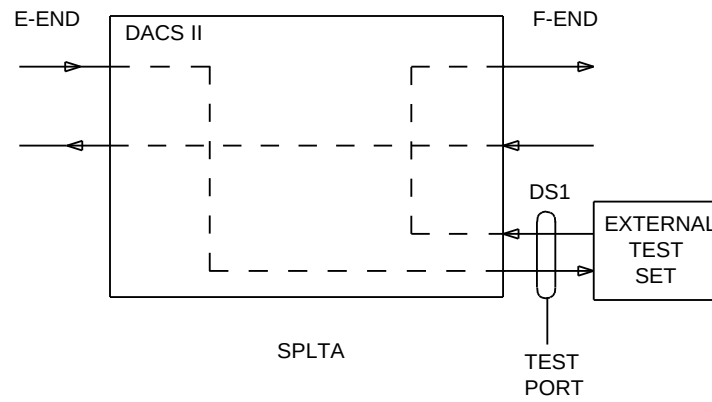
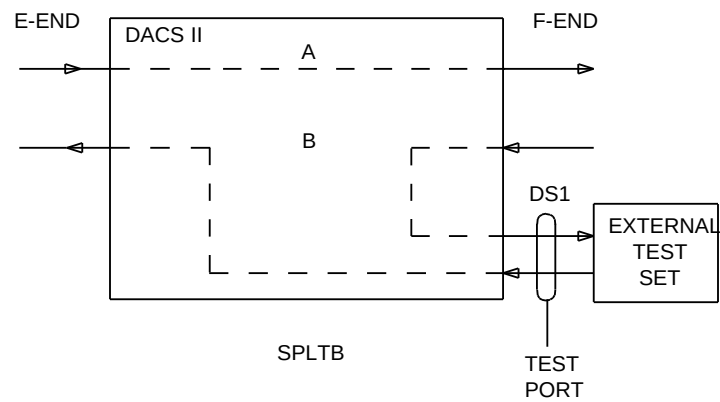
Mode	Meaning	Illustration
MONE	Monitor Equip (E) End of Idle Port or Cross-Connection	Figure 4-3
MONF	Monitor Fac (F) End of Idle Port or Cross-Connection	Figure 4-4
MONEF	Monitor Both Ends	Figure 4-5
SPLTE	Splits E-to-F Connection To Test E End	Figure 4-6
SPLTF	Splits F-to-E Connection To Test F End	Figure 4-7
SPLTEF	Splits Both Directions To Test E and F Ends	Figure 4-8
SPLTA	Splits E-to-F Connection To Test E-to-F Direction	Figure 4-9
SPLTB	Splits F-to-E Connection To Test F-to-E Direction	Figure 4-10
SPLTAB	Splits both connections To allow assignment of FADs	Figure 4-11
LOOPE	Loops E End and Monitors Signal; on 2-Way Circuit, F End Is Disconnected	Figure 4-12
LOOPF	Loops F End and Monitors Signal; on 2-Way Circuit, F End Is Disconnected	Figure 4-13
HUB	Non-channelized connection between FAD and remote FAD	Figure 4-14
LPBKT	Terminally loopback non-channelized FAD	Figure 4-15
TNR	Release one or two FADs and restore circuit to original state	Figure 4-16

The various test modes are achieved by using clear-2 Mbit/s Facility Access Digroups (FADs). FADs are undesignated clear 2-Mbit/s NPCs, referred to by the NPC numbers. The number of simultaneous FADs on a DACS II is limited to the number of provisioned clear-2 Mbit/s NPCs.

**Figure 4-3. MONE Mode****Figure 4-4. MONF Mode**

**Figure 4-5. MONEF Mode****Figure 4-6. SPLTE Mode**

**Figure 4-7. SPLTF Mode****Figure 4-8. SPLTEF Mode**

**Figure 4-9. SPLTA Mode****Figure 4-10. SPLTB Mode**

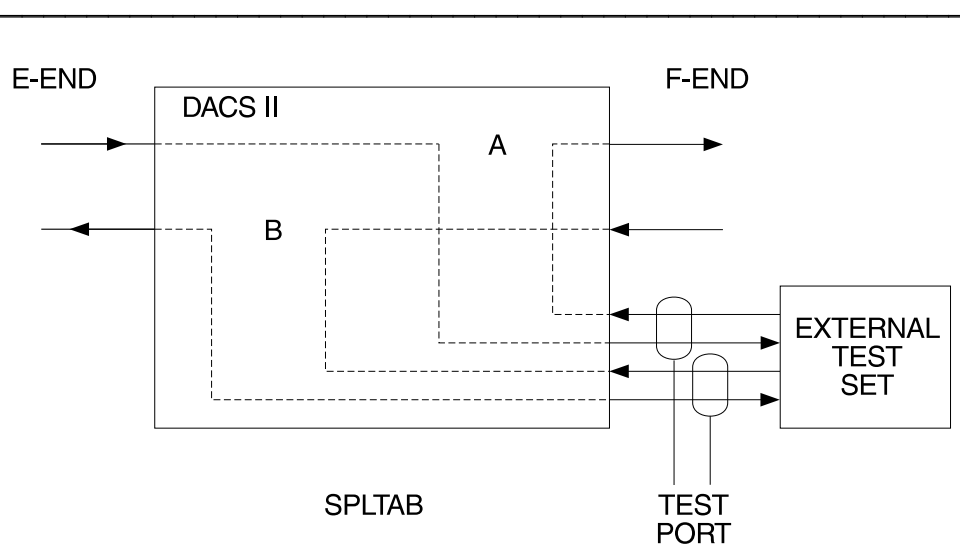


Figure 4-11. SPLTAB Mode

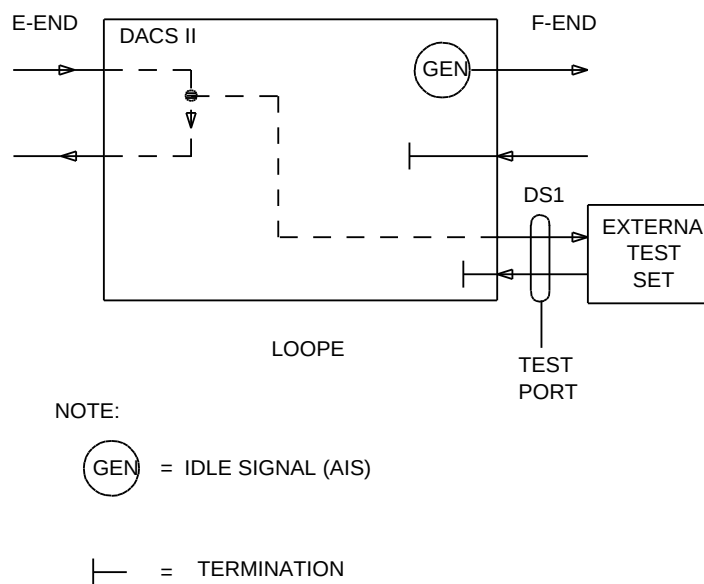
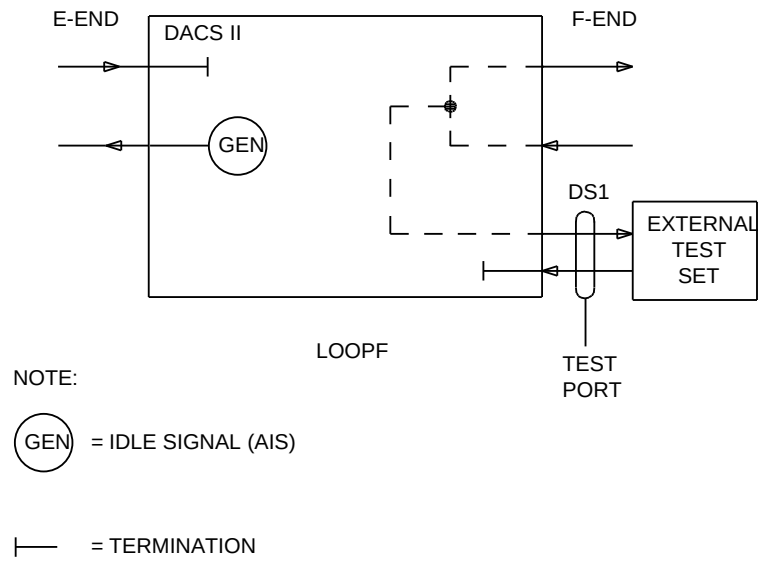


Figure 4-12. LOOPE Mode

**Figure 4-13. LOOPF Mode**

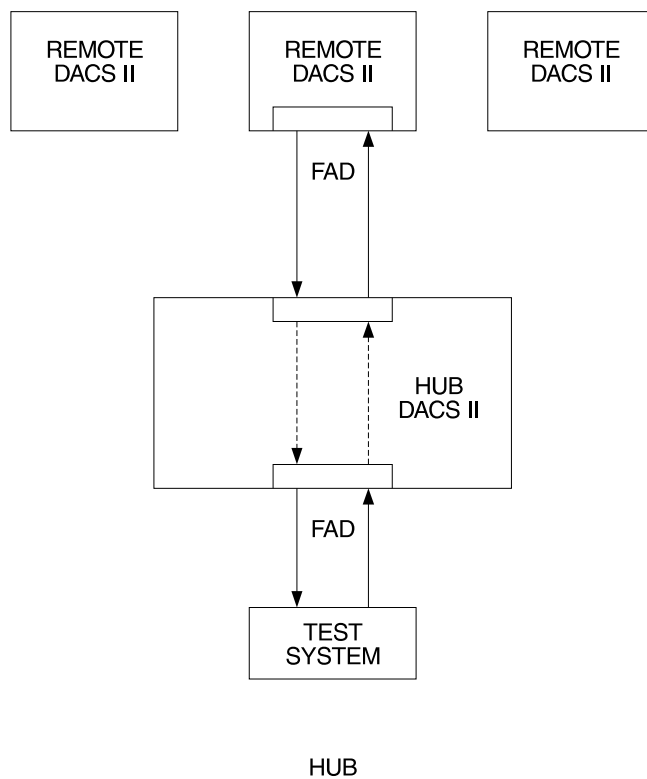


Figure 4-14. HUB Mode

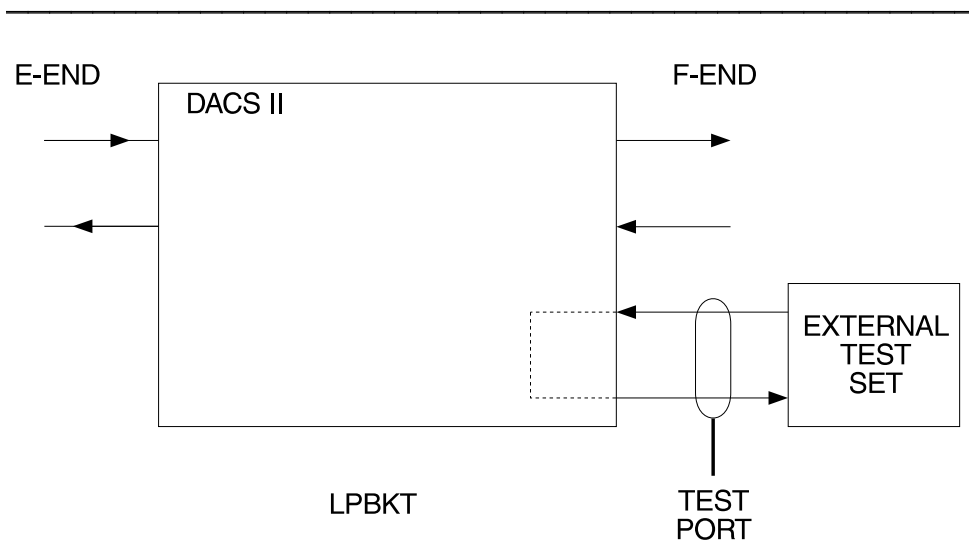


Figure 4-15. LPBKT Mode

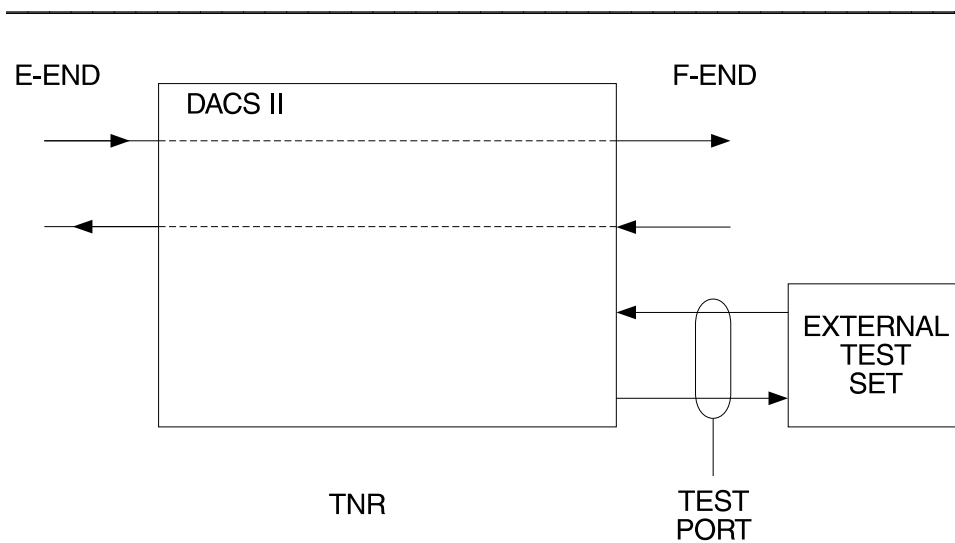


Figure 4-16. TNR Mode

Establish/Change Clear-2 Mbit/s Test Access

Overview: This procedure sets up or changes non-channelized test access in the monitor mode, split mode, loop mode, hub mode, or test-NPC release mode. The circuit under test can be one unmapped NPC or a pair of unmapped NPCs. the mapped circuit may be a one-way, two-way, or broadcast circuit. A one-way circuit can only be tested in the monitor E side (MONE) or split A circuit (SPLTA) modes. Only one test connection can exist at a time for any circuit.

⇒ NOTE:

This procedure excludes the HUB, LPBKT, and TNR modes.

1. Familiarize yourself with the following command:

```
CTST::<tmode>,FAD (<npc No.1>[,<npc No.2>])\
[,FROM <npc No.3>][,TO <npc No.4>]!
```

Where:

- <tmode> = Test access mode; see Table 4-2.
- <npc No.1> = NPC number of the FAD or the 1st NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).
- <npc No.2> = Optional. 2nd NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB.
- <npc No.3> = Reference NPC, E-end NPC, or backbone of BCON.
- <npc No.4> = Optional.

2. To establish the test connection, enter the command with the appropriate information.

⇒ NOTE:

For test modes MONEF, SPLTAB, and SPLTEF, two FADs must be entered. If the 2nd FAD is omitted, the FAD pair defaults to <npc No.1> and <npc No.1> + 1. (If <npc No.1> is the highest NPC number on the DACS II frame, the 1st NPC on the frame is used.)

- If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

3. To change the test access mode, enter the following command:

```
CTST::<tmode>,FAD (<npc No.1>[,<npc No.2>])!
```

Where:

- <tmode> = New test mode; see Table 4-2.

- <npc No.1> = NPC number of the FAD or the 1st NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).
- <npc No.2> = Optional. 2nd NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB.

⇒ NOTE:

For test modes MONEF, SPLTAB, and SPLTEF, two FADs must be entered. If the 2nd FAD is omitted, the FAD pair defaults to <npc No.1> and <npc No.1> + 1.

- If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

Hub Mode

Overview: In the hub mode, a two-way connection is formed between a FAD and an unmapped clear-2 Mbit/s NPC, which is connected to a FAD on a remote DACS II. This connection serves as a connection to the remote FAD, which can test access a circuit on that DACS II without a direct connection to a test system.

1. Familiarize yourself with the following command:

CTST: :HUB, FAD <npc No.1>, TO <npc No.2>!

Where:

<npc No.1> = NPC number of the FAD.

<npc No.2> = Number of NPC connected to the remote FAD.

2. Enter the command with the appropriate information.

- If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

Loopback Mode

Overview: In the loopback mode, the input port of the FAD is connected to the output port. The FAD must be unmapped or must have been released from test access first.

1. Familiarize yourself with the following command:

CTST: :LPBKT, FAD <npc No.1>!

Where:

<npc No.1> = NPC number of the FAD to be looped back.

2. Enter the command with the appropriate information.
 - If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

Release Test Port

Overview: When a FAD has been released from testing, any circuit under test is restored to its original state and any termination on a circuit as a result of splitting or looping shall be released automatically. However, any actual termination change made by the user will remain unless released/terminated prior to ending the test session. If two FADs are being used in the test session, both FADs are released when the first one is specified in the command.

1. Familiarize yourself with the following command:

CTST::TNR,{FAD (<npc No.1>[,<npc No.2>])|ALL}[,OOS]!

Where:

<npc No.1> = NPC number of the FAD or the 1st NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB.
Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = Optional. 2nd NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB.

ALL = Release all FADs.

OOS = Used for out-of-service circuits.

2. Enter the command with the appropriate information.
 - If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

Change Clear-2 Mbit/s Circuit Termination State

Overview: The termination mode of any circuit under test, can be changed with the following procedure.

1. Familiarize yourself with the following command:

CTST::FAD (<npc No.1>[,<npc No.2>])[,TO <npc No.3>]\[,EMODE {NORM|TERM}][,FMODE {NORM|TERM}]!

Where:

<npc No.1> = NPC number of the FAD or the 1st NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = Optional. 2nd NPC number of the FAD pair for MONEF, SPLTEF, and SPLTAB.

<npc No.3> = Optional. To name new F-end NPC of a BCON; if omitted, the test session retains the same F-end NPC.

EMODE/FMODE = Optional. To select termination mode for E-end and/or F-end:

NORM = normal data of the cross-connection

TERM = terminate side with default termination signal

2. Enter the command with the appropriate information.

- If the command is denied, find the reason for the denial and perform corrective action to obtain completion. (*Command Denials* has explanations of denials codes).

Remove and Degrow Equipment

5

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Remove and Degrow Equipment

5

Remove and Degrow NPC

Overview: This procedure gives the commands to remove NPC(s) (network processing circuit) from service and to degrow the NPC(s) from the data base. After removing a pack from service, the pack can be removed from the frame. After degrowing a pack or group, it can be regrown with different specifications.

1. To list all plug-ins enter:
UTL::QRY,EQD,NPCS[,UNIT [q]q]! and after response enter
UTL::QRY,OOS[,UNIT [q]q]!.

Where: [q]q = Unit number (1 through 16).



NOTE:

If XON option is selected for link, you can use CTRL-s and CTRL-q to stop and start the output.

2. Check the output messages to determine which NPC packs are grown and still in-service. The presence of the CP (circuit pack) number itself or the presence of a "1" in the listing indicates that the condition (equipped, out-of-service) exists.

3. See CAUTION. Enter
RMV::NPC <npc No.>[-<range>][,SIDE s][,INCL]!

**CAUTION:**

Any NPC with cross-connections should only be removed if warranted by trouble clearing because service on all channels of the NPC will be interrupted.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Use only for FTU (facility terminating unit).

SIDE s = Use for DSPU (digital signal processing unit) NPC.

INCL = Use if special service CONNs exist.

**NOTE:**

When the NPC is removed from service, no plug-in or facility alarms will be registered and a predefined insertion word will be sent out on all channels if the plug-in is in the frame.

**NOTE:**

To expedite degrowing DSPU NPCs, the degrow NPC command removes both NPC sides from service and degrows the NPC; the RMV command is not used.

4. If the NPC is going to be degrown, continue with Step 5.
 - If not, this procedure is completed.

5. Enter **UTL::QRY,CMAP <npc No.>[-<range>]!**

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional; to specify last NPC of continuous range.

- If there are any cross-connections on the NPCs, refer to *Cross-Connections and Disconnections* to disconnect the DS0 channels or clear-DS1s and then continue with this procedure.
- If there are any test access cross-connections, enter **TTST::TPR,TP kk[,OOS]!** for test access to make disconnections.

6. If subject NPC is the test port digroup (NPCTP designation), enter **DGRTH::NPC <npc No.>,NPCTP n[,TPR]!** to remove the TP designation (TPR word releases and degrows any test ports).

7. Enter **DGRTH::NPC <npc No.>[-<range>]!**.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Remove and Degrow IFTU/FTU

Overview: This procedure gives the commands to remove IFTU (integrated facility terminating unit) or FTU (facility terminating unit) plug-ins from service and to degrow the unit. After removing a pack from service, the pack can be removed from the frame. After degrowing a pack or group, it can be regrown with different specifications. To expedite degrowing a unit, the associated ETSIs (expanded time slot interchangers), or CCBs (cross-connect buffers) and TSIs (time slot interchangers) are automatically degrown with the unit UC (unit controller). There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

1. To list all plug-ins enter:

```
UTL : :QRY,EQD[,UNIT [q]q]! and after response enter
UTL : :QRY,OOS[,COMMON][,UNIT [q]q]!.
```

Where: [q]q = Unit number (1 through 16).

⇒ NOTE:

There are two options on these commands to restrict the extent of the queries; these are [UNIT [q]q] to specify a particular unit and [,COMMON] to specify no NPCs.

⇒ NOTE:

If XON option is selected for link, you can use CTRL-s and CTRL-q to stop and start the output.

2. Check the output messages to determine which UNIT packs are grown and still in-service. The presence of the CP number itself or the presence of a "1" in the listing indicates that the condition (equipped, out-of-service) exists.
3. Consider the following comments relating to removing service and degrowth:
 - When unit packs are removed from service and the unit UC is degrown, the associated and ETSIs, or CCBs and TSIs, will **automatically** be removed and degrown (disconnected). This occurs only if the associated packs are not supporting cross-connections or other packs (subentities).

4. Enter the following commands to remove the UNIT.

RMV::UNIT [q]q,FC sb! (See Note 1.)

RMV::UNIT [q]q,FTMI d!

RMV::UNIT [q]q,UC! (See Note 2.)

Where:

[q]q = Unit number (1-16)

sb = side and format converter (FC) number (1-4)

d = FTMI (facility terminating module interface) number (1-4).

⇒ NOTE 1:

If the FTMI is to be degrown, this command does not need to be entered because FCs on both sides will be removed with FTMI degrowth command.

⇒ NOTE 2:

If the FTMI is to be degrown, do not enter this command now because the unit UC must be in-service to use other commands. This command will be entered after the FTMI is degrown in the next step.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

5. If the UNIT is to be degrown, enter the following commands. The DGRTH FTMI command will have to be entered for each FTMI (1-4) that is grown.

DGRTH::UNIT [q]q,FTMI d!

RMV::UNIT [q]q,UC!

DGRTH::UNIT [q]q!

⇒ NOTE:

The ETSIs, or CCBs and TSIs on both sides of the unit will be removed and degrown when the unit is degrown.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Remove and Degrow DSPU

Overview: This procedure gives the commands to remove DSPU (digital signal processing unit) plug-ins from service and to degrow the unit. After removing a pack from service, the pack can be removed from the frame. After degrowing a pack or group, it can be regrown with different specifications. To expedite degrowing a unit, the associated ETSIs, or CCBs and TSIs, are automatically degrown with the unit UC. There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

1. To list all plug-ins enter:

UTL : :QRY,EQD[,UNIT [q]q]! and after response enter
UTL : :QRY,OOS[,COMMON][,UNIT [q]q]!.

Where: [q]q = Unit number (1 through 16).

⇒ NOTE:

There are two options on these commands to restrict the extent of the queries; these are [UNIT [q]q] to specify a particular unit and [,COMMON] to specify no NPCs.

⇒ NOTE:

If XON option is selected for link, you can use CTRL-s and CTRL-q to stop and start the output.

2. Check the output messages to determine which UNIT packs are grown and still in-service. The presence of the CP number itself or the presence of a "1" in the listing indicates that the condition (equipped, out-of-service) exists.
3. Consider the following comments relating to removing service and degrowth:
 - When a pack in a duplicated circuit group is removed on the active side, service will automatically switch over to the other side (if in-service).
 - To expedite degrowing DSPU NPCs, the degrow NPC command removes both NPC sides from service and degrows the NPC; the RMV command is not used.

4. Enter the following commands to remove the DSPU.

RMV::UNIT [q]q,DSPI!

RMV::UNIT [q]q,UC!

Where: [q]q = Unit number (1-16)

5. If the UNIT is to be degrown, enter the following command.

DGRTH::UNIT [q]q!

⇒ NOTE:

The ETSIs, or CCBs and TSIs on both sides of the unit will be degrown when the unit is degrown.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Remove and Degrow ECCN/CCN

Overview: This procedure gives the commands to remove ECCN (expanded cross-connect network) or CCN (cross-connect network) plug-ins. The ECCN/CCN plug-ins are degrown when the units are degrown. After removing a pack from service, the pack can be removed from the frame. After degrowing a pack or group, it can be regrown with different specifications. This is the main reason for degrowing a unit, and, to expedite this, the associated ETSIs or CCB and TSIs are automatically degrown with the unit UC. There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

1. Enter **UTL : : QRY, EQD!** and after response enter **UTL : : QRY, OOS[, COMMON][, UNIT [q]q]!**.

Where: [q]q = Unit number (1 through 16).

⇒ NOTE:

There are two options on these commands to restrict the extent of the queries; these are [UNIT [q]q] to specify a particular unit and [,COMMON] to specify no NPCs.

⇒ NOTE:

If XON option is selected for link, you can use CTRL-s and CTRL-q to stop and start the output.

2. Check the output messages to determine which ECCN/CCN packs are grown and still in-service. The presence of a "1" or the presence of the CP number itself in the listing indicates that the condition (equipped, out-of-service) exists.
3. Consider the following comments relating to removing service and degrowth:
 - Allowable active-side removals are: ETSIs if no involved TCON (two-way cross-connect) maps; CCI if no associated ETSIs in-service; and FC if no associated NPCs in-service.
 - When a pack in a duplicated circuit group is removed on the active side, service will automatically switch over to the other side (if in-service).
 - Service cannot be removed from the remaining side if there are any in-service NPCs.
 - When unit packs are removed from service and the unit UC is degrown, the ETSI will **automatically** be removed and degrown (disconnected). This occurs only if the associated packs are not supporting cross-connections or other packs (subentities).

4. Enter the following command to remove ECCN or CCN plug-ins (see Note).

**NOTE:**

When UNIT is to be degrown, the ETSI (or CCB and TSIs) on both sides will be removed.

For ECCN:

RMV::ETSI S, ECCN s, ALL! (for all ETSIs on Side s)

RMV::ETSI sqq! (for individual ETSI)

RMV::CCI s!

Where: qq = Unit Number 1 through 16.

For CCN:

RMV::TSIS, CCN s, ALL! (for all TSIs on Side s)

RMV::CCB sf!

RMV::CCNI s!

RMV::TSI sft!

Where:

s = Side 0 or 1

f = CCB number 1 through 6

sft = TSI number consisting of sides (0 or 1)
FROM unit (1 through 6) and TO unit (1 through 6);
for example, TSI 013 is on Side 0 and receives
data FROM unit 1 and connects TO unit 3.

**NOTE:**

A major alarm will be registered after the ECCN/CCN side has been out of service for more than two minutes.

5. Enter the following commands to degrow the UNIT.

DGRTH::UNIT [q]q!

Where: [q]q = Unit number 1 through 16.

⇒ NOTE:

The ETSI (or CCB and TSIs) and the FMTs on both sides of the unit will be removed and degrown when the unit is degrown.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Cross-Connections and Disconnections

6

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Cross-Connections and Disconnections

6

Cross-Connect, Change, Disconnect 64-kb/s Signals

Enter Cross-Connect Command

Two-Point, Two-Way or One-Way Circuit

Overview: This section deals with 1-way or 2-way cross-connections between channels of NPCs. These channels will either be connected using CAS (channel associated signaling) or NSA (nonsignaling associated) mode. The 32 time slots in the 2.048 Mb/s signal are normally referred to by telephone channel number in the DACS II commands. With this numbering, channels 00 through 15 correspond to the like-numbered time slots and channels 16 through 30 correspond to time slots 17 through 31. DACS II channel 31 corresponds to time slot 16 which carries signaling in the CAS mode.

1. Before you enter the command, familiarize yourself with the command fields and variations which follow. The order of entering the channel terminations in the command is only meaningful for 1-way circuits, test access, and <tc> and SC command fields.

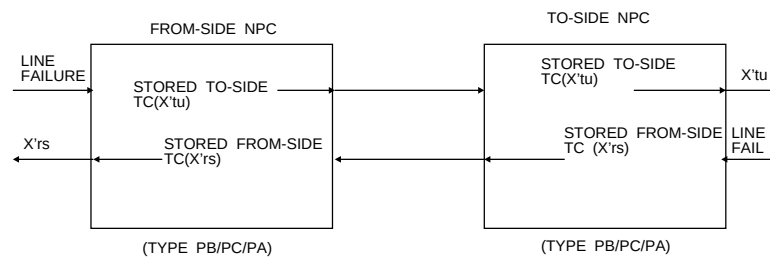
Two-Way:

```
{TCON|TCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj  
[-kkk],[<tc>],[SC(abcd,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

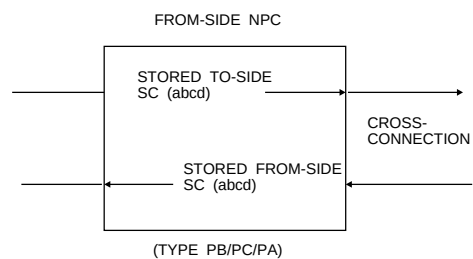
One-Way:

```
{OCON|OCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj  
[-kkk],[<tc>],[SC(----,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

2. If you are going to enter a channel range connection, consider the following:
 - For pure 2.048-Mb/s Interface and CAS mode, the range is any continuous group of 30 channels or less (01 through 30). CAS channels 00 and 31 (TS16) and NSA channel 00 are not allowed in range connection.
 - For pure 2.048-Mb/s Interface and NSA mode, the range is any continuous group of 31 channels or less (01 through 31).
3. If you need information on the TC (trunk conditioning) field, see Part A of Figure 6-1 and consider the following:
 - The FROM and TO sides of the TC field correspond to the FROM and TO terminations entered in the command.
 - If one or both sides are transparent (no signaling), the TRSP,IW X'pq form must be used. The signaling pattern given by X'D is automatically sent on the CAS side.
 - If specific <tc> is entered for 1-way circuits, dashes must be entered for the FROM side; for example, TC(X'--,X'FF).



A. TRUNK CONDITIONING



B. SIGNALING CONVERSION

Figure 6-1. Trunk Conditioning and Signaling Conversion Diagrams

4. If you need information on the SC (signaling conversion) field, see Part B of Figure 6-1 and consider the following:
 - The FROM and TO sides of the SC field correspond to the FROM and TO terminations entered in the command.
 - SC is not recommended in a pure 2.048-Mb/s Interface to 2.048-Mb/s Interface connection, the SC is done on each end of the connection and the net result is to cancel it out.
5. Enter the appropriate command for type of circuit required:

Two-Way:

```
{TCON|TCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj  
[-kkk],[<tc>],[SC(abcd,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

One-Way:

```
{OCON|OCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj  
[-kkk],[<tc>],[SC(---,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

Where:

TCON,TCNT = TCON for 2-way or TCNT for 2-way terminated.

OCON,OCNT = OCON for 1-way or OCNT for 1-way terminated.

<npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number; 01 through 30/31 (00 is TS0).

eee = Optional, to give the last channel of continuous range of channels to be connected.

<npc No.2> = NPC number of other side (TO); see <npc No.1>.

jjj = Channel number; 01 through 30/31 (00 is TS0).

kkk = Optional, to give the last channel of same width range as other side.

<tc> = Optional trunk conditioning. See Figure 6-2.

SC(abcd,abcd) = Optional, dictates the use of signaling bits (abcd) in Ts16 on the FROM and TO sides. The possibilities for the bits are: 0, 1, P (for pass through), and V (inverted).

NAM = Only used for digital data (no analog encoding) to disable A-law (2.048-Mb/s Interface) to μ -law encoding conversions.

RDC = Optional, designates special service.

CUS = Optional, customer controlled circuit.

INCL = To remove previous CUS channel designation.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion. *Command Denials* gives the meanings of the condition codes.

6. Familiarize yourself with connection query outputs:

- To obtain the other end of a connection and to see trunk conditioning, enter: **UTL::QRY,TO ,<npc No.>jjj[-kkk]!**

Where:

<npc No.2> = NPC number and channel number of specific termination.

kkk = Optional, last channel of a range of channel terminations.

- For all connections on NPC, enter **UTL::QRY,CMAP <npc No.>!**

Where: <npc No.> = NPC number of one side of the connection.

⇒ NOTE:

An asterisk appears alongside OCONs in the CMAP/RTMAP to identify one-way circuits. If *000000 appears, the QRY FROM for OCON circuits can be used to see connection.

- For 1-way circuits, you can query the connection (if any) in the other direction of the same NPC by entering **UTL::QRY,FROM <npc No.>ddd!.**

16-STATE SIGNALING;	NO SIGNALING/TRANSPARENT;
Hexadecimal: TC(X'rs,X'tu),IW X'nn	TRSP,IW X'nn
Binary: TC(efghijkl,mnopqrst),IW X'nn	
X'rs = Hex word for 8-bit pattern to be sent on FROM side rs = binary abcdabcd	
X'tu = Hex word for 8-bit pattern to be sent on TO side tu = binary abcdabcd	

Figure 6-2. Construction of Trunk Conditioning Field

Two-Point Gateway Circuit

Overview: This section deals with 1-way or 2-way cross-connections between channels of PBCs (primary block circuits). These channels will either be assembled using CAS (channel associated signaling) or NSA (nonsignaling associated) mode. The 32 time slots in the 2.048-Mb/s signal are normally referred to by telephone channel number in the DACS II commands. With this numbering, channels 00 through 15 correspond to the like-numbered time slots and channels 16 through 30 correspond to time slot 17 through 31. DACS II channel 31 corresponds to time slot 16 which carries signaling in the CAS mode.

1. Before you enter the command, familiarize yourself with the command fields and variations which follow. The order of entering the channel terminations in the command is only meaningful for 1-way circuits, test access, and <tc> and SC command fields.

Two-Way:

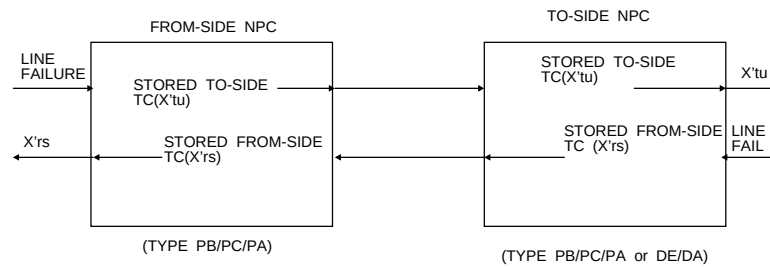
```
{TCN|TCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj
[-kkk],<tc>[,SC(abcd,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

One-Way:

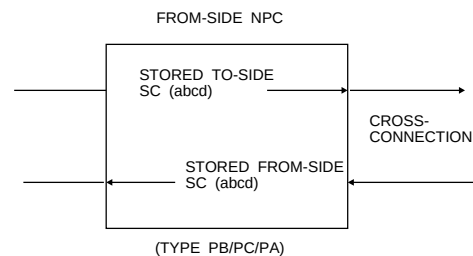
```
{OCN|OCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj
[-kkk],<tc>[,SC(----,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

2. If you are going to enter a channel range connection, consider the following:
 - For 2.048-Mb/s Interface and CAS mode, the range is any continuous group of 30 channels or less (01 through 30). CAS channels 00 and 31 (TS16) and NSA channel 00 are not allowed in range connection.
 - For 2.048-Mb/s Interface and NSA mode, the range is any continuous group of 31 channels or less (01 through 31).
 - For connection to DS1, the range is any continuous group of 24 channels or less. These will fall into the 01 through 24 range on the DS1 side and 01 through 30/31 range on the 2.048-Mb/s Interface side.

3. If you need information on the TC (trunk conditioning) field, see Part A of Figure 6-3 and consider the following:
- The FROM and TO sides of the TC field correspond to the FROM and TO terminations entered in the command. With the 16-state TC format (for connection to type DE1yz NPC), bits abcd must be entered with ab=cd (for example, hex 5 = 0101) on both the DS1 and 2.048-Mb/s Interface sides.
 - If one or both sides are transparent (no signaling), the TRSP,IW X'pq form must be used. The signaling pattern given by X'D is automatically sent on the CAS side.
 - If specific <tc> is entered for 1-way circuits, dashes must be entered for the FROM side; for example, TC(X'--,X'FF).
 - In a gateway application, when E1 channels are connected to T1 channels, the following rules apply to the transmittal of the Insertion Word (IW) towards the facility. If the Insertion Word needs to be transmitted towards the facility as a result of consequent action, then the Insertion Word transmitted by the T1 NPC towards its transmission facility is the Insertion Word specified in this command; however, the Insertion Word transmitted by the E1 NPC towards its facility is always X'FF.
-
-



A. TRUNK CONDITIONING



B. SIGNALING CONVERSION

Figure 6-3. Trunk Conditioning and Signaling Conversion Diagrams

4. If you need information on the SC (signaling conversion) field, see Part B of Figure 6-3 and consider the following:
 - The FROM and TO sides of the SC field correspond to the FROM and TO terminations entered in the command.
 - The defaults for the <sc> field are: PP01 (Type DE1 NPC), PPPP (Type DE2 or DE3 NPC), and 1101 (with TRSP <tc>).

5. Enter the appropriate command for type of circuit required:

Two-Way:

```
{TCON|TCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj
[-kkk],<tc>[,SC(abcd,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

One-Way:

```
{OCON|OCNT}::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj
[-kkk],<tc>[,SC(----,abcd)][,NAM][,RDC][,{CUS|INCL}][,PRIOUT]!
```

Where:

TCON,TCNT = TCON for 2-way or TCNT for 2-way terminated.

OCON,OCNT = OCON for 1-way or OCNT for 1-way terminated.

<npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number; 01 through 24 (00 is data link) for DS1 NPC, 01 through 30/31 (00 is TS0) for type PB/PC NPC.

eee = Optional, to give the last channel of continuous range of channels to be connected.

<npc No.2> = NPC number of other side (TO); see <npc No.1>.

jjj = Channel number; 01 through 24 (00 is data link) for DS1 NPC, 01 through 30/31 (00 is TS0) for type PB/PC NPC.

kkk = Optional, to give the last channel of same width range as other side.

<tc> = Trunk conditioning; required for DS1 channel connection (gateway). See Figure 6-3.

SC(abcd,abcd) = Optional, dictates the use of signaling bits (abcd) in TS16 on the FROM and TO sides. The possibilities for the bits are: 0, 1, P (for pass through), and V (inverted).

NAM = Only used for digital data (no analog encoding) to disable A-law (2.048-Mb/s Interface) to μ -law encoding conversions.

RDC = Optional, designates special service.

CUS = Optional, customer controlled circuit.

INCL = To remove previous CUS channel designation.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

6. Familiarize yourself with connection query outputs:

- To obtain the other end of a connection and to see trunk conditioning, enter:

UTL::QRY,T0 ,<npc No.>jjj[-kkk]!

Where:

<npc No.2> = NPC number and channel number of specific termination.

kkk = Optional, last channel of a range of channel terminations.

- For all connections on NPC, enter:

UTL::QRY,CMAP <npc No.>!

Where: <npc No.> = NPC number of one side of the connection.

⇒ NOTE:

An asterisk appears alongside OCONs in the CMAP/RTMAP to identify one-way circuits. If *000000 appears, the QRY FROM for OCON circuits can be used to see connection.

- For 1-way circuits, you can query the connection (if any) in the other direction of the same NPC by entering
UTL::QRY,FROM <npc No.>ddd!.

Two-Way Multipoint Circuit

Overview: This section covers both symmetrical and broadcast multipoint configurations that are set up using the DSPU (DMB-type) NPC or virtual NPC. The virtual NPCs are 961 and 962 (99101 and 99102) for non-CEF frames, and [9]961 through [9]966 (99101 through 99106) for CEF frames. For broadcast circuits, the common leg or BBL (backbone leg) is established using the LEG,BBL combination of command keywords and each tributary is connected using the LEG,BRD combination of keywords. For a symmetrical (SYM) bridge, each leg is connected to the DMB bridge using the LEG,SYM combination of keywords. The FTU termination connected to a bridge is called a LEG.

1. See Figure 6-4 for models of multipoint circuits produced by DMB NPCs.
See Figure 6-5 for multipoint circuits produced by specifying virtual NPCs.

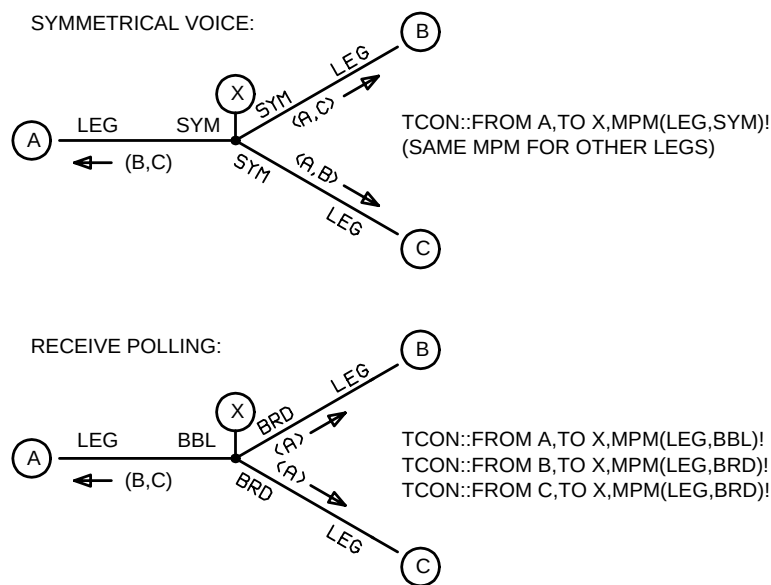


Figure 6-4. DMB Circuit Configurations

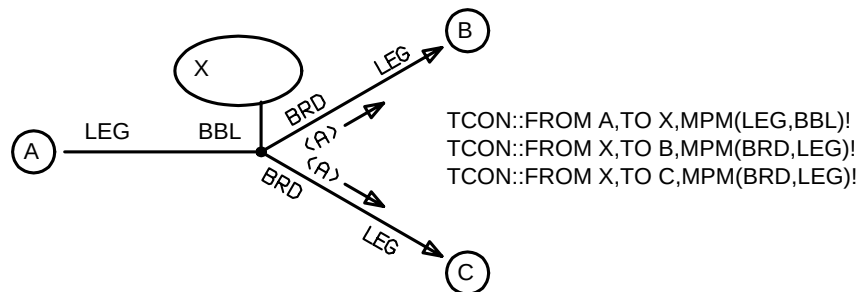


Figure 6-5. Virtual NPC Broadcast

⇒ NOTE:

DACS II conferencing equipment provides μ -law companding for use with DS1 signals. The DPC card for 2.048-Mb/s Interface makes needed conversions unless a data conference (no encoding) is specified by the NAM command word. The first 2.048-Mb/s Interface connection determines the conference type (μ -law or data).

2. Study the following command and obtain needed information:

```
TCON|TCNT:[FRM xy,SEQ ww]:FROM <npc No.1>ddd[-eee],
TO <npc No.2>jjj[-kkk],MPM(fmd,tmd),[<tc>][,NAM][,NTR m]
[,RDC][,{CUS|INCL}][,PRIOUT]!
```

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.1> = NPC number for FROM side. See Table 6-1.

TCON,TCNT = TCON is for 2-way, TCNT is for 2-way terminated.

ddd/jjj = Conference number if bridging end or channel number if facility leg end.

The channel numbers run 01 through 30 or -31 (NSA) for type PB/PC NPCs or 01 through 24 for DS1 NPCs.

<npc No.2> = NPC number for TO side; see <npc No. 1>.

eee/kkk = Optional, last channel of continuous range to be connected.

<tc> = Optional, trunk conditioning. If entered, does not have to be same for each leg but must be of form TRSP,IW X'nn. If omitted, the default of TRSP,IW X'FF applies.

NAM = No A-law to μ -law

The A-law to μ -law and μ -law to A-law code translators on the E1 type NPC are disabled. This keyword is valid in the following types of cross-connects:

Multipoint:

E1 to E1: Multipoint cross-connects have A-law to μ -law and μ -law to A-law set as a default. This conversion is performed on pure E1 multipoint connections in case a DS1 leg is ever added to the broadcast connection. The **NAM** keyword is used to disable the conversions. It may be desirable to disable conversions in a pure E1 multipoint cross-connect since such a connection has more quantization noise than a pure E1 two-point cross-connect. This is due to the back to back A-law to μ -law and μ -law to A-law conversions which are taking place.

E1 to DS1 or DS1 to E1: Same explanation as E1 to E1.

DS1 to DS1: Not applicable.

fmd,tmd = Designators for FROM and TO side modes (See Table 6-1). Enter appropriate one for each side: SYM for DMB end

of symmetrical, BBL for backbone, bridge end;
BRD for nonbackbone, bridge end; or LEG for FTU NPC
end. This field determines the direction of data flow
of broadcast circuit.

NTR m = Optional, shuts off transmission toward FROM (m=F)
or TO (m=T) side.

RDC or CUS = Optional, designates red special service (RDC) or
customer control (CUS).

INCL = Optional, removes previous channel CUS designation.

PRIOUT = Optional; to give priority to associated output message
by placing it on the top of the output message queue.

Table 6-1. Multipoint NPC and Channel Numbers

Command Field	Leg-End NPC	Bridge-End DMB NPC	Bridge-End Virtual NPC
<npc No.>	Any facility NPC	DMB NPC (Type MB)	961,962 (or [9]961 - [9]966)
Channel No.	01 - 30 (or 31 with NSA)	01 - 85	001 - 500
Mode (fmd,tmd)	LEG	SYM,BBL,BRD	BBL,BRD

3. Enter cross-connect command for segment of multipoint circuit. If <tc> field is required for DS1 connection, see Figure 6-6 for construction of <tc>.

⇒ NOTE:

If command line runs over line length for your screen, you can break the line with a backslash and continue the command on the next line.

<tc> = TRSP,IW X'nn
(Default = TRSP,IW X'FF)

Figure 6-6. Construction of TRSP Trunk Conditioning

4. Repeat the procedure to connect remaining segments to the bridge; the same trunk conditioning and any special service designations must be entered for each segment.

**NOTE:**

If NOBBL appears in completion message, it indicates that the broadcast backbone connection has not yet been entered.

5. To see all the conference legs, enter

UTL::QRY,TO <npc No.>ddd!

Where: <npc No.> = NPC number of bridging (DMB) or virtual NPC
ddd = Conference or channel number.

**NOTE:**

Notice that the NTR directions in the output are in terms of what was entered for the TO-side in the query.

Broadcast Circuit

Overview: This section presents the BCON commands for establishing broadcast circuits through the cross-connect network. Up to eight tributaries can be connected to the broadcast leg at one time by listing them in the TOX field of the command. Unless the looped or no return keywords are used, the DACS II will designate the first tributary that is entered as the full tributary which is the only one that returns transmission to the broadcast leg. This return path can be subsequently changed using the CHG SWCH command.

1. Familiarize yourself with the commands as follows:

Multiple tributaries (up to 8):

BCON: [FRM xy, SEQ ww]:FROM <npc No.1>ddd-eee, TOX (<npc No.2>jjj, <npc No.3>nnn, <npc No.4>ppp), [<tc>][, <sc>][, NAM][, {NTR|LPD|CONV}][, RDC][, {CUS|INCL}]!

Single Tributary:

BCON: [FRM xy, Seq ww]:FROM <npc No.1>ddd -eee, TO <npc No.2>jjj-kkk, [<tc>][, <sc>][, NAM][, {NTR|LPD|CONV}][, RDC][, {CUS|INCL}]!

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.1> = Broadcast NPC number, either extended (for example [0]001) or hierarchical (for example, 01101).

ddd-eee = Range of channels to be broadcast (for example, 01 through 24).

TOX = Up to 8 tributaries can be connected to the broadcast leg at one time.

jjj/nnn/ppp = First channel on tributary that is to be connected to; the channel range is set by broadcast leg.

<npc No.2> = NPC number of first tributary; see <npc No.1>.

<npc No.3> = NPC number of second tributary; see <npc No.1>.

<npc No.4> = NPC number of third tributary; see <npc No.1>.

<tc> = Trunk conditioning; can be either the TC format (signaling) or TRSP,IW X'mn format. Different values can be used on legs, but same type format required.

<sc> = Optional for gateway to dictate the use of signaling bits (abcd) on FROM and TO sides. The general form is "SC(abcd,abcd)" and the values are: 0, 1, P (pass through), and V (inverted).

NAM = No A-law to μ -law

The A-law to μ -law and μ -law to A-law code translators on the E1 type NPC are disabled. This keyword is valid in the following types of cross-connects:

Multipoint:

E1 to E1: Multipoint cross-connects have A-law to μ -law and μ -law to A-law set as a default. This conversion is performed on pure E1 multipoint connections in case a DS1 leg is ever added to the broadcast connection. The **NAM** keyword is used to disable the conversions. It may be desirable to disable conversions in a pure E1 multipoint cross-connect since such a connection has more quantization noise than a pure E1 two-point cross-connect. This is due to the back to back A-law to μ -law and μ -law to A-law conversions which are taking place.

E1 to DS1 or DS1 to E1: Same explanation as E1 to E1.

DS1 to DS1: Not applicable.

NTR,LPD or CONV = Optional, to designate no return transmission (NTR), to loop the broadcast (LPD), or to convert (CONV) existing 2-way, 2-point connection to BCON.

RDC = Optional, to designate red special service.

CUS = Optional, to designate customer control service.

INCL = Needed to remove CUS or special service.

2. Enter the command with the required information.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

If the command runs over line length for your screen, you can break the line with a backslash and continue the command on the second line.

3. Repeat this procedure if additional tributaries must be added to complete the broadcast circuit.

One-Way Multipoint Circuit

Overview: This section explains a method to establish one-way broadcast circuits using the OCON MPM command and virtual NPC [9]961 through [9]966 (or 99101 through 99106). To build such a circuit, you establish the backbone leg to the virtual NPC using the LEG,BBL combination of command keywords and connect each tributary to the backbone using the BRD,LEG combination of keywords. The FTU termination is always called a LEG. A range of channels can be broadcast using the channel range option for the backbone leg; this range is specified once and applies to the entire circuit. The broadcast circuit formed in the virtual NPC cannot be connected to another bridge circuit (concatenated) for further fanout.

1. See Figure 6-7 for a model of the pure broadcast network produced by specifying the first virtual NPC (9961). The commands are only examples.
2. The NPC for 2.048-Mb/s Interface legs makes the needed conversions unless a data conference (no encoding conversion) is specified by the NAM command word. The first 2.048-Mb/s Interface connection determines the conference type (μ -law or data).
3. Study the following command and obtain needed information,
OCON:[FRM xy,SEQ ww]:FROM <npc No.1>ddd[-eee],
TO <npc No.2>jjj[-kkk],MPM(fmd,tmd),[<tc>][,NAM][,RDC]
[,{CUS|INCL}[,PRIOUT]!

Where:

- xy = DACS II frame number (00 through ZZ)
- ww = Command sequence number (00 through 49)
- <npc No.1> = NPC number for FROM side. For bridging end, use virtual NPC. For leg end, use facility NPC.
- ddd/jjj = Conference number (001 through 500) if bridging end or channel number 01 through 30 or -31 (NSA) for type PB/PC NPCs if facility leg end.
- eee/kkk = Optional, last channel of continuous range to be connected.
- <npc No.2> = TO-side identification; <npc No. 1>.

fmd,tmd = Designators for the FROM- and TO-side modes;
use BBL for bridge end of backbone, BRD for
bridge end of tributary, and LEG for FTU NPC end.

<tc> = Optional, trunk conditioning. If entered,
does not have to be same for each leg, but
TRSP,IW X'nn form must be used. If omitted,
the default TRSP,IW X'FF applies.

NAM = No A-law to μ -law

The A-law to μ -law and μ -law to A-law code translators on the E1 type NPC are disabled. This keyword is valid in the following types of cross-connects:

Multipoint:

E1 to E1: Multipoint cross-connects have A-law to μ -law and μ -law to A-law set as a default. This conversion is performed on pure E1 multipoint connections in case a DS1 leg is ever added to the broadcast connection. The **NAM** keyword is used to disable the conversions. It may be desirable to disable conversions in a pure E1 multipoint cross-connect since such a connection has more quantization noise than a pure E1 two-point cross-connect. This is due to the back to back A-law to μ -law and μ -law to A-law conversions which are taking place.

E1 to DS1 or DS1 to E1: Same explanation as E1 to E1.

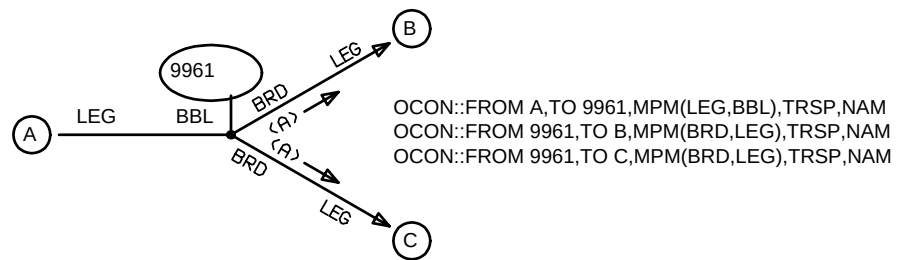
DS1 to DS1: Not applicable.

RDC = Optional, designates special service.

CUS = Optional, designates customer control circuit.

INCL = Optional, removes previous CUS channel designation.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

**Figure 6-7. Virtual NPC Broadcast**

4. Enter cross-connect command for segment of multipoint circuit. If <tc> field is required for DS1 connection, see Figure 6-8 for details.
 - If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ **NOTE:**
OCNT can be substituted for OCON in the command to provide preservice terminated state.

⇒ **NOTE:**
If command line runs over line length for your screen, you can break the line with a backslash and continue the command on the next line.

⇒ **NOTE:**
If NOBBL appears in completion message, it indicates that the broadcast backbone connection has not yet been entered.

<tc> = TRSP,IW X'nn
Default = TRSP,IW X'FF

Figure 6-8. Construction of TRSP Trunk Conditioning

5. Repeat the procedure to connect remaining segments to the bridge.
6. To see all conference legs, enter:

UTL::QRY,TO <npc No.>ddd!

Where: <npc No.>ddd = NPC number of virtual NPC and "ddd"
is conference number.

Enter Change Cross-Connect Command

1. To change the termination state, enter the command listed under TERMINATION STATE in Figure 6-9 to make desired changes. Command options allow changing the state of all the bridge terminations or all except the one named in the NOT field.
 - If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

**NOTE:**

The termination state or TLP (transmission level point) of a conference bridge circuit cannot be changed using the command in Figure 6-9 if the T or F side was previously designated as NTR (no transmit) in TLA command.

2. To change to conference bridge parameters, enter the command listed under CONFERENCE BRIDGE PARAMETERS in Figure 6-9.

**NOTE:**

To make a change, the DMB bridge side of the conference must be entered in the <npc No.2> field of the command.

3. Check completion message for required changes; note the NEW STATE field in the message. The presence of RNG in the termination change message indicates that the states in the range of circuits changed may differ. The RDC/CUS word will occur if special service circuits were changed.

TERMINATION STATE:

**CHG::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj[-kkk]
[,NOT <npc No.>vvv],TLA/TLR F/T/B/L/G/A[,INCL]!**

TTST::TLA/TLR F/T/B/L/G/A[,NOT <npc No.>vvv],TP kk!

CONFERENCE BRIDGE PARAMETERS:

**CHG::FROM <npc No.1>ddd,TO <npc No.2>jjj[,TLP(snn,smm)]
[,NG nn][,ES ee][,INCL]!**

EXPLANATION OF VARIABLES:

- <npc No.1> = NPC number on FROM side, either extended
(for example, [0]001) or hierarchical (for example, 01101).
- <npc No.2> = NPC number, see <npc No.1>.
- ddd/-jjj = Channel number on NPC.
- eee/-kkk = Optional, last channel of range.
- TLA or TLR = Desired state, TLA (terminated) or TLR (released) on
circuit as follows:
F (FROM-Side)
T (TO-Side)
B (Both)
G (all legs toward bridge)
L (all legs toward facilities)
A (all legs in both directions)
also see "NOT <npc No.>vvv" below.
- NOT <npc No.>vvv = For bridge only, to specify one leg that is NOT to be
changed with all others.
- TP kk = Test port number (01-48).
- INCL = Optional, needed if channel in command is red special
service circuit.
- TLP (snn,smm) = Signal level adjustment, "snn" is the input level and
"smm" is output level;
s = the sign (+ or -). Range for both is -9.0 to +8.8
in 0.2 dB steps (entered as whole No. -90 to +88).
- NG nn = Noise Guard Adjustment in dB (00, 06, 12, or 18).
- ES ee = Echo Suppression in dB (00, 06, 12, or 18).

Figure 6-9. Change Commands

Disconnect Cross-Connected Circuit

1. Familiarize yourself with the disconnect circuit commands as follows:

```
{TDIS|ODIS}: [FRM xy, SEQ ww]: FROM <npc No.1>ddd[-eee],
TO <npc No.2>jjj[-kkk][, CONV][, INCL][, OOS][, DCC][, PRIOUT]!
BDIS: [FRM xy, SEQ ww]: FROM <npc No.1>ddd-eee,
TOX (<npc No.3>nnn, ...) [, CONV][, OOS][, INCL]!
```

Where:

TDIS, ODIS = TDIS to disconnect TCON or ODIS to disconnect OCON.

BDIS = BDIS to disconnect broadcast (BCON) circuit.

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<npc No.1> = NPC number on one side (FROM); either extended (for example, [0]001) or hierarchical

ddd = Channel number (1 through 30 for PB-type NP.)

eee = Optional, to name last channel of range.

<npc No.2> = NPC number on other side (TO); see FROM side.

jjj[-kkk] = Channel number or optional range of channels on NPC.

<npc No.3>nnn = NPC number and first channel on other (up to 8 total) tributaries to be disconnected.

CONV = Optional for BDIS only; entered with next-to-last disconnection to convert the remaining circuit to 2-way TCON circuit.

INCL = Optional, to allow disconnect of circuit with RDC or CUS designation. The CUS stays with the circuit and NPC and requires use of INCL when reassigned.

OOS = Optional, to disconnect circuits when NPC is out-of-service.

DCC = Optional, to retain previous connection <tc> code instead of NPC not-connected code; not for broadcast.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

2. If you are going to use the BDIS command, consider the following comments:
 - To disconnect up to eight tributaries at one time, add a listing of the NPCs in the form "<npc No.3>nnn,<npc No.4>ttt..." where each NPC and the first channel of range is listed with commas. The optional listing goes in the field after the "<npc No.2>jjj" in the command.
 - When using individual BDIS commands for each tributary, the full tributary (one with return path) must be disconnected last.
 - The CONV option causes the broadcast side and final tributary to be connected as a 2-way circuit.
 - When using the range and CONV options, the one tributary not included in the range becomes part of the 2-way circuit.
 - If you need to check for RDC or CUS channel designations, enter one of the following commands:
 For specific channel(s):
UTL : :QRY, MARK <npc No.>ddd [-eee] !
 For NPC numbers:
UTL : :QRY, MARK <npc No.>[-<range>] !.
 - Enter the appropriate disconnect command. For one-way circuits, the sides must be entered like the OCON or NOMTH (no match) denial will result; you may need to use **UTL : :QRY, FROM <npc No.>ddd!** to find the sides of a 1-way connection.
- ⇒ NOTE:**
 If CUS appears in the completion message, it indicates that the CUS designation remains with the circuit and NPC until INCL keyword is used in subsequent cross-connect or remove command.
- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
- If a multipoint circuit (conference or broadcast) was disconnected, check the output message for additional information given as follows: MPDIS indicates that bridge has been fully disconnected; NOBBL indicates that there is no backbone leg now; and BRDIS indicates that the BCON has been fully disconnected, last tributary disconnected.

⇒ NOTE:

If CUS appears in the completion message, it indicates that the CUS designation remains with the circuit and NPC until INCL keyword is used in subsequent cross-connect or remove command.

- If additional legs of a multipoint circuit must be disconnected, repeat the procedure as needed.

Cross-Connect, Change, or Disconnect Clear-2 Mb/s Signals

DACS II is synchronous equipment. A clear, unframed connection maintains some delay so timing is not transparent.

Cross-Connect Clear-2 Mb/s Signals

⇒ NOTE:

To establish a clear 2 Mb/s cross-connection, TG192(s) must be provisioned as type PA NPCs with y = C (framed clear) or D (unframed clear). Cross-connections may be set up between framed and unframed clear-2 Mb/s signals. If a framed, clear circuit is connected to an unframed, clear circuit, the TS0 spare bits will be passed through the DACS untouched.

Two-Point, Two-Way or One-Way Circuit

1. Familiarize yourself with the commands shown below. The FROM and TO side assignments serve as references for 1-way connections (OCONS) and for test access.

```
{TCON|TCNT}: [FRM xy, SEQ ww]: FROM <npc No.1>, TO <npc No.2>
[ , RDC] [ , CUS|INCL] [ , PRIOUT] !
```

```
{OCON|OCNT}: [FRM xy, SEQ ww]: FROM <npc No.1>, TO <npc No.2>
[ , RDC] [ , CUS|INCL] [ , PRIOUT] !
```

Where:

TCON, TCNT, = TCON is for 2-way, TCNT is for 2-way terminated,
OCON, or OCNT = OCON is for 1-way, and OCNT is for 1-way terminated.

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.1> = NPC number of one side (FROM), either extended
(for example, [0]001) or hierarchical (for
example, 01101).

<npc No.2> = NPC number of other side (TO); see <npc No.1>.

RDC = Optional; to designate red special service circuit.

CUS = Optional; to designate customer controlled channels.

INCL = Optional; to remove previous CUS channel designation.

PRIOUT = Optional; to give priority to associated output message
by placing it on the top of the output message queue.

2. Obtain information needed for command from circuit layout information.
3. Enter cross-connect command. If command line runs over line length for your screen, you can break the line with a backslash and continue the command on the next line.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Broadcast Circuit

Overview: This section shows the commands for establishing broadcast circuits through the cross-connect network. Up to eight tributaries can be connected to the broadcast leg at one time by listing them in the command. Unless the looped (LPD) or no transmit on return (NTR) keywords are used, the DACS II will designate the first tributary that is entered as the full tributary which is the only one that returns transmission to the broadcast leg. This return path can be changed using the appropriate command described later. Two-way circuits can be changed to broadcast circuits by using the convert (CONV) option. With no options, the circuit is set up as a two-way broadcast with a full tributary.

1. Familiarize yourself with the following commands. They can be used to set up the broadcast circuit or add one or more tributaries to an existing circuit.

Single Tributary:

BCON: [FRM xy, SEQ ww]:FROM <npc No.1>, TO <npc No.2> [, {NTR|LPD|CONV}] [, RDC] [, {CUS|INCL}] !

Multiple Tributaries (up to 8):

BCON: [FRM xy, SEQ ww]:FROM <npc No.1>, TOX (<npc No.2> [, <npc No.3>] [, <npc No.4>] [, . . .]) [, {NTR|LPD|CONV}] [, RDC] [, {CUS|INCL}] !

Where:

<npc No.1> = Broadcast NPC number, either extended (for example [0]001) or hierarchical (for example, 01101).

<npc No.2> = NPC number of first tributary; see <npc No.1>.

<npc No.3> = NPC number of second tributary; see <npc No.1>.

<npc No.4> = NPC number of third tributary; see <npc No.1>.

NTR, LPD or CONV = Optional, to designate no return transmission (NTR), to loop the broadcast (LPD), or to convert (CONV) existing 2-way, 2-point connection to BCON.

RDC = Optional, to designate red special service.

CUS = Optional, to designate customer control service.

INCL = Needed to remove CUS or special service.

2. Enter the command with the required information.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

If the command runs over length for your screen, you can break the line with a backslash and continue the command on the second line.

3. Repeat this procedure to include all tributaries in the broadcast circuit.

Switch Return Leg of Broadcast Circuit

Overview: The return path (full tributary) of the broadcast circuit can be switched to one of its one way tributaries. Up to eight two-way broadcast circuits can have their full tributaries switched with this command by specifying the respective full tributary NPCs, all of which are clear-2 Mb/s NPCs currently part of different broadcast circuits.

1. Familiarize yourself with the following command:

CHG: :SWCH,TOX(<npc No.1>[,<npc No.2>][,...])[,INCL]!

Where:

<npc No.1> = New full tributary, either extended (for example [0]001) or hierarchical (for example, 01101).

<npc No.2> = Full tributary to be switched; see <npc No.1>.

INCL = Needed to switch a full tributary of a special service or customer controlled broadcast cross-connection.

2. Enter the command with the required information.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

If the command runs over length for your screen, you can break the line with a backslash and continue the command on the second line.

Change Termination State of Cross-Connection

Overview: This section describes the command used to change the termination state of a cross-connected, clear-2 Mb/s NPC. This command can be used with a 2-way, 1-way, or broadcast cross-connection. This command can change the termination state of all legs of a broadcast circuit with the use of the TLA option. However, an option can be used to exclude one of the legs from being changed.

1. Familiarize yourself with the following command:

CHG: :FROM <npc No.1>,TO <npc No.2>[,NOT <npc No.3>],\{TLA|TLR}{F|T|B|A}[,INCL]!

Where:

<npc No.1> = FROM termination NPC, either extended (for example [0]001) or hierarchical (for example,

01101).

<npc No.2> = TO termination NPC; see <npc No.1>.

<npc No.3> = NPC not affected by this command (used with broadcast circuits); see <npc No.1>.

INCL = Needed to change termination of a special service or customer controlled cross-connection.

TLA or TLR = Desired state; terminated (TLA) or released (TLR) on circuit as follows:

F - towards the FROM side

T - towards the TO side

B - Both sides

A - All directions of a broadcast circuit

NOT = Used with the A option. Indicates which NPC of a broadcast circuit is not affected by the command.

2. Enter the command with the required information.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

If the command runs over length for your screen, you can break the line with a backslash and continue the command on the second line.

Disconnect Cross-Connected Circuit

Two-Point, Two-Way or One-Way Circuits

1. Familiarize yourself with the command(s) as follows:

{TDIS|ODIS}:[FRM xy,SEQ ww]:FROM <npc No.1>,TO <npc No.2>[,INCL][,OOS][,PRIOUT]!

Where:

TDIS,ODIS = TDIS to disconnect TCON or ODIS to disconnect OCON.

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<npc No.1> = NPC number on one side (FROM); either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = NPC number on other side (TO); see FROM side.

INCL = Optional, to allow disconnect of circuit with RDC or

CUS designation. The CUS stays with the NPC even after the customer controlled circuit is disconnected. The NPC requires the use of INCL when reassigned, thus eliminating the CUS marking from the NPC

OOS = Optional, to disconnect circuits when NPC is out-of-service.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

2. To check for RDC or CUS designations, enter the following command:

UTL::QRY,MARK <npc No.>[-<range>]!

3. Enter the appropriate disconnect command from Step 1.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

For one-way circuits, the sides must be entered like the OCON or NOMTH (no match) denial will result; you may need to use

UTL::QRY,FROM <npc No.>ddd!

Broadcast Circuits

Overview: The disconnection of broadcast circuits can be done for up to eight tributaries. The NPCs can be in different units. Using the convert option (CONV), the broadcast circuit can also be converted to a two-point circuit by disconnecting all but the full tributary.

⇒ NOTE:

To see a listing of the tributaries associated with a source NPC, enter **UTL : : QRY, BCAST, FROM <npc No.1>!**, where <npc No.1> is the source NPC.

1. Familiarize yourself with the following commands:

Single Tributary:

BDIS : : FROM <npc No.1>, TO <npc No.2>[, OOS][, INCL][, CONV]!

Multiple Tributaries:

**BDIS : : FROM <npc No.1>, TOX (<npc No.2>[, <npc No.3>][, ...])
[, OOS][, INCL][, CONV]!**

Where:

<npc No.1> = Source (backbone) NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = Tributary to be disconnected; see <npc No.1>.

<npc No.3> = Tributary to be disconnected; see <npc No.1>.

OOS = Optional, to disconnect circuits when NPC is out-of-service.

INCL = Optional, to allow disconnect of circuit with RDC or CUS designation. The CUS stays with the NPC even after the customer controlled circuit is disconnected. The NPC requires the use of INCL when reassigned, thus eliminating the CUS marking from the NPC

CONV = Optional, converts the circuit to a 2-way, 2-point circuit by disconnecting the indicated tributaries. This option will be denied if there are more than two tributaries remaining or no return path exists.

⇒ NOTE:

If the indicated tributary is a full tributary, it can be disconnected only when there are no other tributaries.

2. Before using the BDIS command, consider the following:
 - When using individual BDIS commands for each tributary, the full tributary (one with return path) must be disconnected last.
 - The CONV option causes the broadcast side and final tributary to be connected as a 2-way circuit.

- When using the range and CONV options, the one tributary not included in the range becomes part of the TO side of a 2-way circuit.

3. To check for RDC or CUS designations, enter the following command:

UTL: :QRY, MARK <npc No.>[-range]!

4. Enter the appropriate disconnect command from Step 1.

- If command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

5. Check the output message for additional information given as follows: MPDIS indicates that bridge has been fully disconnected; NOBBL indicates that there is no backbone leg now; and BRDIS indicates that the BCON has been fully disconnected, last tributary disconnected.

⇒ NOTE:

If CUS appears in the completion message, it indicates that the CUS designation remains with the circuit and NPC until INCL keyword is used in subsequent cross-connect or remove command.

6. If additional legs must be disconnected, repeat the procedure as needed.

Re-Direct Cross-Connections

Re-Direct DS0 Signals

The DS0 "roll" capability allows cross-connected DS0 signals to be redirected onto other (unmapped) DS0 channels with minimal service interruption. Of the three steps in the *roll* process (bridge, roll, and cut), minimum service interrupts only occur during the *roll* step. The DS0 signal being redirected can be part of a circuit of any type. The following types of cross-connections can be redirected:

- Two point (one-way, two-way)
- Broadcast
- DMB (BBL and BRD legs)
- Virtual

⇒ NOTE:

The ROLL procedure will re-direct ALL cross-connections associated with the DS0 signal being rolled.

⇒ NOTE:

The ROLL command enables you to redirect one DS0 or a range of contiguous mapped DS0s within a E1 signal.

⇒ NOTE:

Circuits under test/testports cannot be re-directed.

The following procedure is for redirecting

1. Bridge the DS0 signals using the command:

```
SW: :BDCST, OLD <npc No.1>ddd[ -eee], NEW <npc  
No.2>jjj[ -kkk], [INCL] !
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range.

<npc No.2> = New NPC number. (See <npc No.1>.)

INCL = Optional, used to force bridging of RDC or CUS channels

2. Redirect the DS0 signal using the command:

```
SW::ROLL,OLD <npc No.1>ddd[-eee],NEW <npc  
No.2>jjj[-kkk]\  
[,INCL][,FRC][,OOS]!
```

Where:

- <npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).
ddd, jjj = Channel numbers for the beginning of a channel range.
eee, kkk = Optional, channel numbers for the end of a channel range.
<npc No.2> = New NPC number. (See <npc No.1>.)
INCL = Optional, used to force roll of RDC or CUS channels (required for subrate).
FRC = Optional, used to force a roll **TO** an NPC which is in PBA.
OOS = Optional, used to force a roll **FROM** an NPC which is OOS.

⇒ NOTE:

The size of the range on the OLD and NEW NPC must match, but the starting channel numbers do not have to be identical. A range can not break up the channels in a BCON or virtual circuit (i.e., all the channels of a BCON leg must be within the channel range of the ROLL command).

⇒ NOTE:

If the OLD NPC contains a 32-channel cross-connect with the AIS option, the ROLL command must have a 32-channel range.

3. Disconnect the bridged circuits using the following command:

**NOTE:**

The *disconnect* step may also be referred to as *cut*.

SW::DISC <npc No.1>ddd[-eee][,OOS]!

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel numbers for the beginning of channel range.

eee = Optional, channel numbers for the end of channel range.

OOS = Optional, used to disconnect an NPC that is OOS.

4. Verify that the redirection of DS0 signals has been successful using the following commands:

**UTL::QRY,ROLL,DS0,{NPC <npc No.1>[-<range>] | ALL
[,UNIT [q]q]}!**

UTL::QRY,CMAP <npc No.>!

Re-Direct E1 Signals

The E1 *roll* capability allows for redirection of all channels from an incoming facility from one E1 port to another. The following two types of E1 signals can be redirected:

- Channelized E1
- Clear E1

Each channel within a channelized E1 can be of the following circuit types:

- Two-point (one-way or two-way)
- Virtual conference
- Broadcast circuit
- DMB leg
- Subrate channel

A clear E1 can be of the following circuit types:

- Two-point (one-way or two-way)
- Broadcast circuit

⇒ NOTE:

The ROLL command enables one DS0 or a range of contiguous mapped DS0s within a E1 signal to be re-directed.

⇒ NOTE:

Circuits under test/testports cannot be re-directed.

Network Element

The following procedure is for redirecting E1 signals to a network element:

1. Bridge the E1 signals using the command:

```
SW: :BDCST, OLD <npc No.1>ddd[-eee], NEW <npc  
No.2>jjj[-kkk], [INCL]!
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range.

<npc No.2> = New NPC number. (See <npc No.1>.)

INCL = Optional, used to force bridging of RDC or CUS channels.

2. Redirect the E1 signal using the command:

```
SW: :ROLL, OLD <npc No.1>ddd[-eee], NEW <npc  
No.2>jjj[-kkk]\  
[, TWAY][, INCL][, FRC][, OOS]!
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range.

<npc No.2> = New NPC number. (See <npc No.1>.)

TWAY = Optional, used for a two-way roll (bridge and roll combined).

INCL = Optional, used to force roll of RDC or CUS channels.

FRC = Optional, used to force a roll **TO** an NPC which is in PBA.

OOS = Optional, used to force a roll **FROM** an NPC which is OOS.

3. Remove the bridged circuits using the following command:

**NOTE:**

The *disconnect* step may also be referred to as *cut*.

SW::DISC <npc No.1>[,OOS]!

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

OOS = Optional, used to disconnect an NPC that is OOS.

4. Verify that the redirection of E1 signals has been successful using the following commands:

**UTL::QRY,ROLL,DS1,{NPC <npc No.1>[-<range>]} | ALL
[,UNIT [q]q]}!
UTL::QRY,CMAP!**

Non-Network Element

If a spare facility is not available to perform a coordinated roll with another network element, you can redirect an entire traffic carrying E1 signal from an NPC on one digroup card to an NPC on another digroup card using the DSX-1 patch panel. This capability allows replacement or upgrade of a service carrying digroup card with minimal service interruption.

The following procedure is for redirecting a E1 signal using the DSX-1 patch panel.

1. Patch the bridging repeater from the incoming facility monitor jack to <npc No.2>.
2. Provision the alternate NPC using the following commands:

**COPY::NPC <npc No.1>,TO <npc No.2>[-<range>]!
RST::NPC <npc No.2>[-<range>]!**

Where:

<npc No.1> = Source NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = Destination NPC number. (See <npc No.1>.)

<range> = Optional, NPC range. (See <npc No.1>.)

3. Redirect the E1 signal using the following command:

```
SW: :ROLL, OLD <npc No.1>ddd[-eee], NEW <npc  
No.2>jjj[-kkk]\  
[, TWAY][, INCL][, FRC][, OOS]!
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range.

<npc No.2> = New NPC number. (See <npc No.1>.)

TWAY = Optional, used for two-way roll (bridge and roll combined).

INCL = Optional, used to force roll of RDC or CUS channels.

FRC = Optional, used to force roll **TO** an NPC that is in PBA.

OOS = Optional, used to force roll **FROM** an NPC that is OOS.

4. Patch <npc No.2> XMIT to facility input.
5. Remove <npc No.1> from service so it's digroup card can be removed without alarming using the following command:

```
RMV: :NPC <npc No.1>[-<range>][, SIDE s][, INCL]!
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, NPC range. (See <npc No.1>.)

SIDE s = Optional, side of duplicated DSPU circuit to be removed; s = 0 or 1.

INCL = Optional, used to remove RDC or CUS channels (required for substrate).

6. Insert terminator plug into <npc No.1> facility OUT jack.
7. Replace the digroup card and remove the terminator plug from <npc No.1> jack.

8. Restore <npc No.1> to service using the following command:

RST::NPC <npc No.1>[-<range>][,SIDE s]!

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, NPC range. (See <npc No.1>.)

SIDE s = Optional, side of duplicated DSPU circuit to be restored;
s = 0 or 1.

9. Redirect service back to the original NPC using the following command:

**SW::ROLL,OLD <npc No.2>ddd[-eee],NEW <npc
No.1>jjj[-kkk]\
[,TWAY][,INCL][,FRC][,OOS]!**

Where:

<npc No.2> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range.

<npc No.1> = New NPC number. (See <npc No.2>.)

TWAY = Optional, used for two-way roll (bridge and roll combined).

INCL = Optional, used to force roll of RDC or CUS channels.

FRC = Optional, used to force roll **TO** an NPC that is in PBA.

OOS = Optional, used to force roll **FROM** an NPC that is OOS.

10. Disconnect <npc No.2> using the following command:

SW::DISC <npc No.2>[,OOS]!

Where:

<npc No.2> = NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

OOS = Optional, used to disconnect an NPC that is OOS.

11. Remove <npc No.2> from service using the following command:

RMV::NPC <npc No.2>[-<range>][,SIDE s][,INCL]!

Where:

<npc No.2> = NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, NPC range. (See <npc No.2>.)

SIDE s = Optional, side of duplicated DSPU circuit to be removed; s = 0 or 1.

INCL = Optional, used to remove RDC or CUS channels (required for substrate).

12. Remove the bridging repeater.

Timeslot 0 Cross-Connections

The following procedures are used to request the connection of timeslot 0 (TS0) of one NPC to a timeslot other than TS0 on another NPC. A cross-connect mode must be chosen to prevent the TS0 Frame Alignment Signal from being transmitted in a non-TS0 timeslot.

The NPC containing the TS0 timeslot involved in the cross-connection must be of type PA, but not defined as a clear-2 Mbit/s port. The NPC containing the non-TS0 timeslot involved in the cross-connection can be of any 2 Mbit/s NPC type (e.g., PA, PB, or PC), except a clear-2 Mbit/s port.

The cross-connection can be set up in one of two modes:

- Mode 1:** The frame word is converted to a Pseudo Frame Word (PFW) in both directions of the connection to eliminate the possibility of false framing.
- Mode 2:** The frame word is not cross-connected at all. Instead, the content of the Non-Frame Word (NFW) is repeated in the frame word position.

Two-Way Cross-Connections

Overview: The following procedure establishes a two-way cross-connection between a TS0 timeslot and a non-TS0 timeslot.

1. Familiarize yourself with the following command:

```
TCN::FROM <npc No.1><chan No.1>,\
TO <npc No.2><chan No.2>\
[, {PFW(<frame word 1>,<frame word 2>)|NFW}]!
```

Where:

- <npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001) or hierarchical (for example, 01101).
- <npc No.2> = NPC number of the other side (TO); see <npc No.1>.
- <chan No.1> = Channel number of <npc No.1>; 000-030 for CAS type, 000-031 for NSA type.
- <chan No.2> = Channel number of <npc No.2>; 000-030 for CAS type, 000-031 for NSA type.
- PFW = Pseudo Frame Word; used to select Mode 1 of TS0 cross-connection.
- <frame word 1> = Value of PFW; replaces bits 2-8 of the Frame Alignment Signal of the frame word being transmitted from <npc No.2> to <npc No.1>.
- <frame word 2> = Value of PFW; replaces bits 2-8 of the Frame Alignment Signal of the frame word being transmitted from <npc No.1> to <npc No.2>.
- NFW = Non-Frame Word; used to select Mode 2 of TS0 cross-connection.

⇒ NOTE 1:

Bit 2 of TS0 in a 2 Mbit/s signal is used to distinguish the frame word from the non-frame word. It must always be a '0' in the frame word and a '1' in the non-frame word. When defining the PFW, be sure it can be distinguished from the NFW.

If no mode is selected (PFW or NFW) in the command, the default shall be NFW (i.e., the default mode of operation is Mode 2).

**NOTE 2:**

One of the channel numbers specified (<chan No.1> or <chan No.2>) must be channel 000 (TS0), while the other channel number must be a number other than 000 (non-TS0).

2. Enter the command with the appropriate information.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Change Timeslot 0 Monitoring

Overview: This procedure changes the NPC provisioning to start or stop monitoring the national and international bits in TS0 without removing the NPC from service. This provisioning may be specified for one NPC or a range of NPCs. If a bit is being monitored, a message is sent when that bit changes state.

1. Familiarize yourself with the following command:

CHG::NPC <npc No.1>[-<npc No.n>],TS0M abcdefgh!

Where:

<npc No.1> = number of NPC to monitor, either extended
(for example, [0]001) or hierarchical
(for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

abcdefgh = Timeslot 0 monitor bits; ab = spare international bits
Si, c = remote alarm indication, defgh = spare
national bits, S4 through S8 in NFW. Input
values are:
0: do not monitor
1: monitor

2. To view the TS0 bit provisioned for monitoring on an NPC or range of NPCs, enter the following command:

UTL::QRY,TS0M,NPC <npc No.1>[-<npc No.n>]!

Where:

<npc No.1> = number of NPC to view, either extended
(for example, [0]001) or hierarchical
(for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

3. Enter the command with the appropriate information.

- If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Change Timeslot 0 Spare Bits

Overview: this procedure changes the spare bits in the non-frame word of TS0. These bits may be forced to "0", "1", or pass-through states before they are transmitted. For PA type NPCs, these bits may be forced to the inverted state before transmission.

1. Familiarize yourself with the following command:

CHG::NPC <npc No.1>[-<npc No.n>],TS0 abcdefgh!

Where:

<npc No.1> = number of NPC containing TS0, either extended
(for example, [0]001) or hierarchical
(for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

abcdefgh = Spare bits in TS0; ab=spare international bits Si;
c=remote alarm indication, defgh=spare national
bits, S4 through S8 in NFW. Input values are:
0: set bit to "0"
1: set bit to "1"
P: pass bit through unchanged
V: pass bit through inverted (PA type only)
-: do not change current setting

2. To request a display of the provisioned transmit or of the actual received spare international, national, and remote alarm indication (A) bits in TS0 of an NPC or range of NPCs, enter the following command:

UTL::QRY,TS0 s,NPC <npc No.1>[-<npc No.n>]!

Where:

<npc No.1> = number of NPC to view, either extended
(for example, [0]001) or hierarchical
(for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

s = Direction of transmission for TS0 bits:
T: provisioned TS0 values
R: received TS0 values

3. Enter the command with the appropriate information.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Change Non-Frame Word Bits

Overview: this procedure changes the TS0 bits that are not part of the Frame alignment Signal (bit 1 of the Frame Word and bits 1-8 of the Non-Frame word). These bits can be cross-connected transparently or be subject to modification.

1. Familiarize yourself with the following command:

CHG::NPC <npc No.1>[-<npc No.n>],NFS abcdefghi!

Where:

<npc No.1> = number of NPC containing TS0, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

abcdefghi = Spare bits in TS0; a=bit 1 of Frame Word;
bc=bits 1 and 2 of Non-Frame Word, d=remote alarm indication, efghi=bits 4 through 8 of Non-Frame Word. Input values are:
0: set bit to "0"
1: set bit to "1"
P: pass bit through unchanged
V: pass bit through inverted (PA type only)
-: do not change current setting

2. To view the current Non-Frame Word settings, enter the following command:

UTL::QRY,NFS,NPC <npc No.1>[-<npc No.n>]!

Where:

<npc No.1> = number of NPC to view, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.n> = number of last NPC in range; see <npc No.1>.

3. Enter the command with the appropriate information.
 - If the command is denied, find the reason for denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

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Administrator Functions

Add/Delete User

Overview: This procedure contains the commands for the frame administration tasks of adding or deleting users. Command execution priority levels for the user are established during link provisioning. Generally, priority level 1 commands are processed before level 2 commands, and level 2 commands, before level 3. However, if lower priority commands such as queries are received from a user while a higher priority command which requires more processing (for example, DGN SMEM) is underway, the easily completed commands will be executed first. Until set otherwise, all user commands are processed as level 3 by default, and all system administrator commands are processed as level 1. Prioritizing also allows excluding commands from the user. Screening allows blocking groups of messages or including messages associated with other links.

⇒ NOTE:

You must be logged in as frame administrator (user DAX) to perform these tasks.

⇒ NOTE:

After a user is added to the data base, the user can log in on any designated in-service link.

1. Which system administration activity are you going to perform?
 - If **ADD NEW USER**, then continue with Step 2.
 - If **DELETE USER/LINK**, then proceed to Step 7.
2. Note the following considerations concerning the assignment of initial user passwords. A password must have 6 characters: 2 must be alphabetic and 1 must be a number (except for temporary password for new user, any special character can be used instead of a number).
3. Enter the appropriate command to add the user:

Asynchronous Link:

To add a new user on an asynchronous link, enter:

ADD:[FRM xy,SEQ ww]:USER <user id>,NEW!

Where: <user id> = User identification of 2 to 8 alphabetic characters.

When **PASSWD** prompt is received, enter a temporary password.
Reenter as instructed; the password will not be echoed.

Synchronous Link:

To add a new user on a synchronous link, enter:

ADD:[FRM xy,SEQ ww]:USER <user id>,PASSWD <pswd>,NEW!

Where: <pswd> = Temporary password for user.

4. Familiarize yourself with the command groupings and RMON option per Table 7-1 and with the output message screening options (1 through 5) per Table 7-2. Option 2 is the default setting.
 - If the output screening options need to be changed for the link, continue with Step 5.
 - If the output screening options do not need to be changed, check the output message to verify that the correct information was entered. Notify the user that he/she can now log in and change the temporary password to a personal one. You have completed the procedure to add a user.
 - If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Table 7-1. Command Groupings

a (Circuit PROV)	b (EQPT PROV)	c (MTCE)	d (Test Access)	e (Monitor)	f (Common)
XCONs	GRTH	RMV	TTST	AUD	CHG
XCNTs	DGRTH	RST	STST	UTL	ED
XDISs	ADD	DGN	—	—	EXC
SW	DLT	CFR	—	—	ACT
CONF	—	—	—	—	ADD
SECH	—	—	—	—	DLT
SDCH	—	—	—	—	—
SCON	—	—	—	—	—
SCNT	—	—	—	—	—
SDIS	—	—	—	—	—

X represents cross-connect types — TCON, OCON, BCON.

Restricted Maintenance (RMON Option)

RST::SMEM,CLR!

UTL::BOOT,FRAME!

UTL::BMTR,FROM SMEM,TO PMEM[,EXCT]!

Table 7-2. Screening Options

Screening Option (n)	Definition
1	Only the responses to inputs entered on that particular link and by that user are output.
2	The responses to inputs entered on that particular link and by that user are output as well as all autonomous messages (default).
3	Responses to input messages on that particular link and by that user are output as well as responses from specified groups of action verbs from other links. The selection of message groups is made using the GR (a, b, c, d, e, f) field in the screening command.
4	Responses to input messages on that particular link and by that user, responses from specified groups of action verbs from other links (see above), and autonomous messages are output.
5	All responses to all input messages on all links are output as well as all autonomous messages.

5. Enter the following command:

```
CHG:[FRM xy,SEQ ww]:{USER <user id>|LINK j[mm]},  
SCR n[,GR(a,b,c,d,e,f)][,{MCOFF|MCON}]!
```

Where:

USER/LINK = Selects either user or link identification. Include <user id> (2 to 8 alphabetic characters) for USER option or include link No. (1 through 6) and virtual circuit (01 through 16) for synchronous link.

n = Screening option 1 through 5 per Table 7-2.

GR = Optional; field used with SCR 3 or 4 to specify the command groups; enter a "1" for each group in Table 7-1 to be enabled and a "0" for each group to be disabled.

MCOFF|MCON = Optional to disable (MCOFF) component command completion messages or to enable (MCON) completion outputs again. DNY messages cannot be disabled.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

6. Check the output message to verify that the correct information was entered. Notify the user that he/she can now log in and change the temporary password to a personal one. You have completed the procedure to add a user.
7. From office records, determine the user identification for the user to be deleted. If needed, enter the following to determine if the user owns any macros and/or maps:

UTL::QRY,{MACRO|MAP},ATTR[, {USER <user id>|ALL}]!

Where: <user id> = User identification (2 to 8 alphabetic characters).

⇒ NOTE:

Any macro or map files that the user has must also be removed before the user can be deleted from the system (see *Delete Alternate Map From System* and *Delete Macro From System*).

8. Enter **DLT:[FRM xy,SEQ ww]:USER <user id>!** to prevent user identified by **id** (2 to 8 alphabetic characters) from having login access to the frame. Check the output message to verify that the correct information was entered.
 - If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Recover User DAX Password Recovery Procedure

Perform the following procedure to recover the original (default) user DAX password:

1. Locate and obtain the DACS II "PASSWORD RECOVERY CARD (Version 1)".

**NOTE:**

This card is a unique 1.8 Mb flash card that contains just enough information to move the default password to RAM memory.

2. If SMEM is in service—
Enter the following command:

RMV : : SMEM

3. At the frame—
Place the ESD grounding strap on your wrist and physically remove the SMEM card from the CPU2. Figure 7-1 shows the memory card locations on the CPU2 circuit pack.
4. Insert the PASSWORD RECOVERY CARD into the SMEM slot.
5. At the DACS II terminal—
Enter the following command to move the default password into the frame's RAM memory.

UTL : : RCY, PASSWD !

6. Enter the following command

RMV : : SMEM

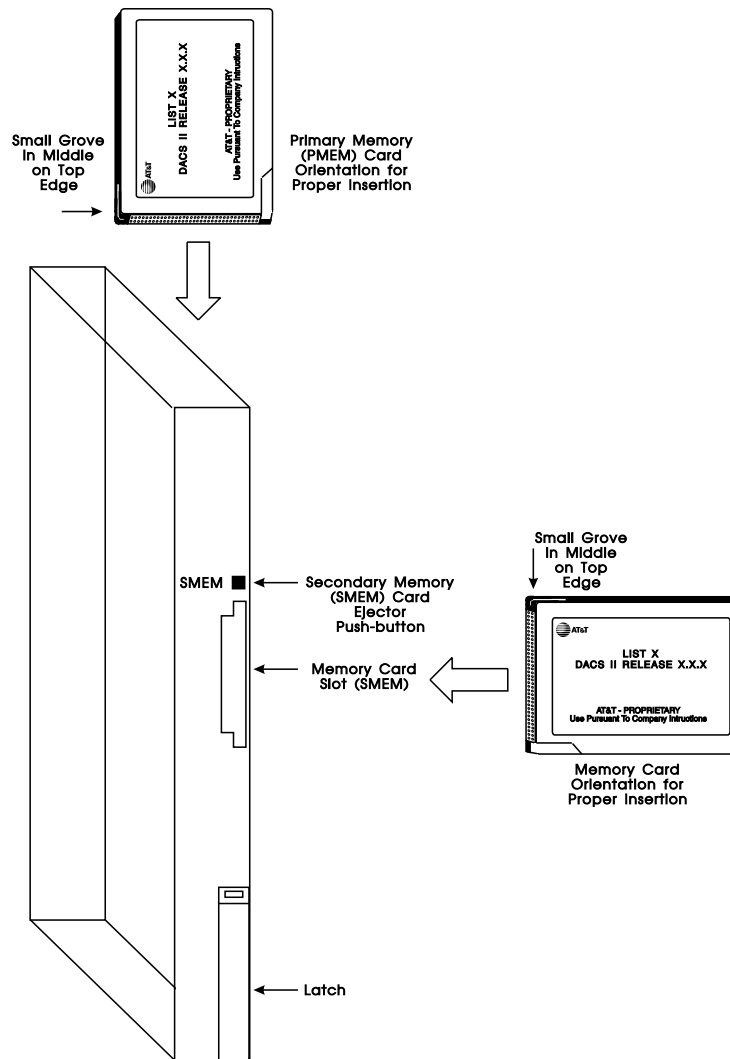


Figure 7-1. Memory Card Locations on CPU2

7. At the frame—
After the command completes successfully—
Place the ESD grounding strap on your wrist and remove the
PASSWORD RECOVERY CARD.
8. Reinsert the SMEM card (removed earlier) into the SMEM slot and enter
the following command:

RST : : SMEM, BKGRND

9. Return the PASSWORD RECOVERY CARD to it's proper location.
10. At this point—
You can change the default password to the desired password or leave the default in and have the administrator (or responsible person) change it.

Reinstate a User That Has Forgotten the Password

To reinstate a user that has forgotten the password, do the following:

1. Assign a temporary password by entering the appropriate command:

Asynchronous Links (Snider Protocol):

ADD:[FRM xy,SEQ ww]:USER <user id>!.

Message prompts will instruct you to enter the temporary password.

Synchronous Links (X.25 Protocol):

ADD:[FRM xy,SEQ ww]:USER <user id>[,PASSWD <pswd>]!.

Where: <pswd> = Only for synchronous links, to enter temporary password in the command. Passwords must have 6 characters: 2 are alphabetic and 1 is a number or special character.

<user id> = User Identification (2 to 8 alphabetic characters).

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
2. After assigning the temporary password, the user can assign his/her personal password.

Log Off Other User

⇒ NOTE:

To forcibly log off another user, you must be logged in as the frame administrator and logged in on a different link.

1. Enter the following command to log off the system:

LOGOFF:[FRM xy,SEQ ww]:{USER <id>|LINK <link No.>}!

Where: xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

USER/LINK = Selects whether user ID or link number will be specified. Only the frame administrator can use the LINK option to log off a user from another link.

<user id> = User identification (2 to 8 alphabetic characters)

<link No.> = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

When trying to log off other users, DACS II does security level checking first. If you are not logged in as frame administrator, you will get a "D7 cannot execute privileged command" denial message.

Change Input Command Priority and Restricted Maintenance Option

Overview: This procedure describes how to change input command priorities for the user or the link. Commands from a single active link go into a queue and are executed in the order issued. Commands from different links go into separate waiting queues, and the *input command priorities* from these links control the order of execution: priority level 1 commands first, then priority 2, then priority 3. Commands with the same priority from different links are executed alternately. To prevent long waits for all lower priority commands, those that have been waiting in the queue for 2 minutes will be executed while higher priority commands that require more processing, like diagnose SMEM, are underway. Until set otherwise, the system processes all user commands as level 3 by default, and all system administrator commands as level 1. By setting the priority of the command groups on all LINKS to zero (excluded), the administrator can establish the use of the login mode because each user will have to log in to access the command set defined for that USER.

When the *restricted maintenance* option is enabled, a link or a specified user can execute the commands listed under *Restricted Maintenance* in Table 7-3.

1. To see the present parameters for any or all links or users, enter the following command and read the **LEV** numbers and the restricted maintenance option from the output:

UTL: :QRY, SCR, {LINK j[mm] [-p[nn]] | USER <user id> | LINKS | USERS} !.

- To read the priority level (LEV) for different commands, relate the level — 0 (excluded group), 1 (lowest), 3 (highest), given after LEV word in the output message to the command groups per Table 7-3.
- The restricted maintenance option (RMON/RMOFF) determines whether the user has permission to use commands in that category.

2. Enter the following command to change input command priorities and/or the restricted maintenance option:

ADD: [FRM xy, SEQ ww]: {USER <user id> | LINK j[mm] [, INCL]}, [LEV(a, b, c, d, e, f)] [, {RMON | RMOFF}] !

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

USER|LINK = Selects whether user or link identification will be used in command.

<user id> = User identification (2 to 8 alphabetic characters).

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link (links 5 and 6).

p[nn] = Range of links or synchronous virtual circuits.

INCL = Optional, for links 5 and 6. Specifies that all provisioning data (including RLK) of the command is applied to all virtual circuits; an individual virtual circuit (mm) cannot be entered when INCL is used.

LEV Field = To change the priority of the six command groupings shown in Table 7-3; enter priority level 0 (excluded), 1 (highest), 2, or 3 (lowest) for all command groups in Table 7-3.

{RMON|RMOFF} = Restricted Maintenance Option
RMON allows the use of the commands listed under *Restricted Maintenance* in Table 7-3.
RMOFF disallows the use of these commands.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Table 7-3. Command Groupings

a (Circuit PROV)	b (EQPT PROV)	c (MTCE)	d (Test Access)	e (Monitor)	f (Common)
XCONs	GRTH	RMV	TTST	AUD	CHG
XCNTs	DGRTH	RST	STST	UTL	ED
XDISs	ADD	DGN	—	—	EXC
SW	DLT	CFR	—	—	ACT
CONF	—	—	—	—	ADD
SECH	—	—	—	—	DLT
SDCH	—	—	—	—	—
SCON	—	—	—	—	—
SCNT	—	—	—	—	—
SDIS	—	—	—	—	—

X represents cross-connect types — TCON, OCON, BCON.

Restricted Maintenance (RMON Option)

RST::SMEM,CLR!

UTL::BOOT,FRAME!

UTL::BMTR,FROM SMEM,TO PMEM[,EXCT]!

Change Message Language

Overview: DACS II Snider and X.25 links will operate in either PDS or MML message languages. Unless previously changed, the message language for the links and users will default to what is defined in the software load. If you want to use a different message language during your login session, you can change the message language for your user id. For example, if the link defaults to PDS but you work in MML, the link will switch to MML when you log in.

This procedure describes how to change the following:

- The message language of the link
- The message language for a user.

1. To see the present parameters for any or all links or users, enter the following command and read the **LANG** type from the output:

```
UTL::QRY,SCR,{LINK j[mm][-p[nn]]|USER <user id>|
LINKS|USERS}!.
```

2. Enter one of the following commands for the appropriate language change:

Change Message Language of the Link:

```
ADD:[FRM xy,SEQ ww]:{LINK j[mm][,INCL]},LANG {P|M|T}!
```

Change Message Language for a Specific User:

```
ADD:[FRM xy,SEQ ww]:{USER <user id>|ALL},LANG {P|M|T}!
```

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<user id> = User identification (2 to 8 alphabetic characters).

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link (links 5 and 6).

INCL = Optional, for links 5 and 6. Specifies that all provisioning data (including RLK) of the command is applied to all virtual circuits; an individual virtual circuit (mm) cannot be entered when INCL is used.

p[nn] = Range of links or synchronous virtual circuits.

LANG {P|M|T} = To change link language as follows:

P for PDS, M for MML, or

T for TABS (Telemetry Async Block Serial)

Change NPC Addressing

Overview: DACS II Snider and X.25 links will operate in one of the following NPC addressing schemes:

- **Extended.** This scheme uses 3 digits to number the NPCs consecutively (for example, **041**). It can only be used on systems of three bays or less.
- **4-Digit Extended.** This scheme uses 4 digits to number the NPCs consecutively (for example, **1041**). The extra digit allows the system to accommodate additional bays.
- **Hierarchical.** This scheme uses a 5-digit number (**uvmnp**). It assigns a number to each NPC according to the unit number (**uv**), module or group number (**m**), and the NPC number within the module (**np**).

Unless previously changed, NPC addressing for the links and users will default to what is defined in the software load. If you want to use a different addressing scheme during your login session, you can change the scheme for your user id. For example, if the link defaults to *extended* but you work in *hierarchical*, the link will switch to hierarchical when you log in. Ensure that the link addressing scheme is allowable as defined in the configuration file.

This procedure describes how to change the following:

- The NPC addressing of the link
- The NPC addressing for a user.

1. To see the present parameters for any or all links or users, enter the following command and read the **NPCAD** type from the output:

UTL::QRY,SCR,{LINK j[mm][-p[nn]]|USER <user id>|LINKS|USERS}!.

2. Enter one of the following commands for the appropriate NPC addressing change:

Change NPC Addressing of the Link:

**ADD:[FRM xy,SEQ ww]:{LINK j[mm][,INCL]|ALL},
NPCAD {E|X|H}!**

Change NPC Addressing for a Specific User:

**ADD:[FRM xy,SEQ ww]:{USER <user id>|ALL},
NPCAD {E|X|H}!**

Where:

- xy = DACS II frame number (00 through ZZ).
- ww = Command sequence number (00 through 49).
- ALL = Optional, for links 5 and 6. Specifies that the NPCAD option applies to all users,

links and virtual circuits.

INCL = Optional, for links 5 and 6. Specifies that all provisioning data (including RLK) of the command is applied to all virtual circuits; an individual virtual circuit (mm) cannot be entered when INCL is used.

<user id> = User identification (2 to 8 alphabetic characters).

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link (links 5 and 6).

p[nn] = Range of links or synchronous virtual circuits.

NPCAD {E|X|H} = NPC addressing scheme, either E (default) for extended (for example, 001), X for 4-digit extended, or H for hierarchical (for example, 01101).

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Change Output Message Screening

Overview: Output message screening allows you to block groups of messages or include messages associated with other links. Any user can change his/her own message screening.

Unless previously changed, output message screening for the links and users will default to what is defined in the software load. If you want to use a different screening option during your login session, you can change the option for your user id. For example, if the link defaults to option 2 but your user id is set to option 5, the link will switch to option 5 when you log in.

This procedure describes how to change the following:

- The output message screen option of the link
- The output message screen option for a user.

1. To see the present parameters for any or all links or users, enter the following command and read the **SCR** field from the output:

UTL: : QRY, SCR, {LINK j[mm] [-p[nn]] | USER <user id> | LINKS | USERS} !.

2. Enter one of the following commands for the appropriate output message screening option change:

Change Message Screening Option of the Link:

**CHG: [FRM xy, SEQ ww] : LINK j[mm],
SCR n[, GR(a, b, c, d, e, f)] [, {MCOFF | MCON}] !**

Change Message Screening Option for a Specific User:

```
CHG:[FRM xy,SEQ ww]:USER <user id>,
SCR n[,GR(a,b,c,d,e,f)][[, {MCOFF|MCON}]]!
```

Where:

xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

<user id> = User identification (2 to 8 alphabetic characters).

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link (links 5 and 6).

n = Screening option 1 through 5 from Table 7-4.

GR = Optional field used with SCR 3 or 4 to specify the command groups; enter a **1** for each group in Table 7-5 to be enabled and a **0** for each group to be disabled.

MCOFF|MCON = Optional, to disable (MCOFF) intermediate completion outputs of macro commands or to enable completion outputs again (MCON - default for users). DNY messages are not disabled.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Table 7-4. Screening Options

Screening Option (n)	Definition
1	Only the responses to inputs entered on that particular link and by that user are output.
2	The responses to inputs entered on that particular link and by that user are output as well as all autonomous messages (default).
3	Responses to input messages on that particular link and by that user are output as well as responses from specified groups of action verbs from other links. The selection of message groups is made using the GR (a, b, c, d, e, f) field in the screening command.
4	Responses to input messages on that particular link and by that user, responses from specified groups of action verbs from other links (see above), and autonomous messages are output.
5	All responses to all input messages on all links are output as well as all autonomous messages.

Table 7-5. Command Groupings

a (Circuit PROV)	b (EQPT PROV)	c (MTCE)	d (Test Access)	e (Monitor)	f (Common)
XCONs	GRTH	RMV	TTST	AUD	CHG
XCNTs	DGRTH	RST	STST	UTL	ED
XDISs	ADD	DGN	—	—	EXC
SW	DLT	CFR	—	—	ACT
CONF	—	—	—	—	ADD
SECH	—	—	—	—	DLT
SDCH	—	—	—	—	—
SCON	—	—	—	—	—
SCNT	—	—	—	—	—
SDIS	—	—	—	—	—

X represents cross-connect types — TCON, OCON, BCON.

Restricted Maintenance (RMON Option)

RST::SMEM,CLR!

UTL::BOOT,FRAME!

UTL::BMTR,FROM SMEM,TO PMEM[,EXCT]!

Change User's Macro/Map Storage Space

Overview: This procedure gives the commands to check and change the user's current macro/map storage space.

1. If you want to check the current storage space assigned to user, either for macro files or alternate maps, enter:

UTL : : QRY, {MACRO|MAP}, SPACE, {USER <user id>|ALL}!

Where: <user id> = User identification (2 to 8 alphabetic characters).

⇒ NOTE:

The space for macros and alternate maps applies to all users; that is, if set at 20 percent, then no user can use over 20 percent of space.

2. To change the space allotted to all the users, enter:

CHG : : {MACRO|MAP}, SPACE nnn!

Where: nnn = Percentage (000 through 100) of the total storage space which is available for distribution to users.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Change Link Removal Permission Option

Overview: The System Administrator can give both links and a specific user id permission to remove links from service. The administrator can also inhibit both links and specific users from removing links from service. Unless previously changed, link removal permission for both links and users will default to allow link removal. If the administrator wants to either allow or inhibit a specific user's link removal permission during their login session, the permission can be changed for that user id. For example, if the link defaults to allow link removal permission but the administrator does not want a specific user to have removal permission, the link will be inhibited when the user logs in.

This procedure describes how to change the following:

- The link removal permission of the link
- The link removal permission for a user.

1. To see the present parameters for any or all links or users, enter the following command and read the **RLK** type from the output:

UTL::QRY,SCR,{LINK j[mm][-p[nn]]|USER <user id>|LINKS|USERS}!.

2. Enter one of the following commands for the appropriate link removal permission change:

Change Link Removal Permission of the Link:

ADD:[FRM xy,SEQ ww]:{LINK j[mm][,INCL]},RLK {A|I}!

Change Link Removal Permission for a Specific User:

ADD:[FRM xy,SEQ ww]:{USER <user id>|ALL},RLK {A|I}!

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Where: xy = DACS II frame number (00 through ZZ).
ww = Command sequence number (00 through 49).
<user id> = User identification (2 to 8 alphabetical characters).
j[mm] = Physical link number (1 through 6) and virtual circuit
(mm = 01 through 16) for synchronous link
(links 5 and 6).
p[nn] = Range of links or synchronous virtual circuits.
INCL = Optional, for links 5 and 6. Specifies
that all provisioning data (including RLK) of the
command is applied to all virtual circuits; an
individual virtual circuit (mm) cannot be entered
when INCL is used.
RLK {A | I} = To specify whether users
(other than user DAX) and links
(for nonlogin mode) are permitted to remove
links from service. **A** is to allow
and **I** is to inhibit removal.

Feature Package Upgrade

Overview: This section describes how to upgrade your current software generic to another feature package within the same generic. Follow both procedures in this section in order.

Preparation for Feature Package Upgrade

1. Verify that there are currently no alarms on the DACS II frame being upgraded by observing the status panel on the frame.

⇒ **NOTE:**

If alarms do exist, verify that the alarms are NOT equipment alarms. If equipment alarms do exist, they must be cleared before proceeding with this procedure. Facility alarms, such as CGAs, are acceptable.

2. On the DACS II frame being upgraded, verify the feature package that is currently running with the following command:

UTL : : QRY, FPKG !

3. Compare the features listed on the new flash card being used to upgrade the DACS II frame with the output of step 2. The new flash card must contain all of the features that are included in the package currently running, and may contain additional features.

⇒ **NOTE:**

If the new flash card does not contain all of the features currently running on the DACS II frame, do not proceed with this procedure. Contact your Account Representative for the proper feature packages.

4. If you have completed steps 1 through 3 successfully, complete the procedure in the next section, *Feature Package Upgrade Procedure*.

Feature Package Upgrade Procedure

⇒ **NOTE:**

Before upgrading the feature package within the same generic, complete the procedure in the previous section, *Preparation for Feature Package Upgrade*.

1. Login as a user with Restricted Maintenance (RMON) privileges, such as User DAX.

2. Place the DACS II frame into maintenance condition by entering the following command:

RST : : MC, MCOND !

3. If a flash card is currently installed in the SMEM slot of the TM778 CPU2 circuit pack, remove the flash card from service by entering the following command:

RMV : : SMEM !

4. Physically remove the SMEM card from the slot and install the new flash card with the new features into the SMEM slot.

5. Restore the new flash card into service by entering the following command:

RST : : SMEM !

6. Transfer the new executables to the PMEM by entering the following command:

UTL : : BMTR, FROM SMEM, TO PMEM, EXCT !

Answer YES when prompted. Wait for the command to complete before continuing.

⇒ NOTE:

The transfer will take approximately 5 minutes to complete. If the command is denied, find the reason for the denial and perform corrective action to obtain command completion. (*Command Denials* has explanations of denial codes.)

7. Verify that the executables transferred correctly by entering the following command:

UTL : : QRY, MEMSTAT !

⇒ NOTE:

The FPKG values in the output of the MEMSTAT command will be identical for both the PMEM and SMEM.

8. Remove the flash card from service by entering the following command:

RMV : : SMEM !

9. Physically remove the new flash card from the SMEM slot and install the old flash card into the SMEM slot.

10. Restore the old flash card into service by entering the following command: **RST : : SMEM !**

11. Transfer the new executables onto the old flash card by entering the following command:

UTL : :BMTR, FROM PMEM, TO SMEM, EXCT !

⇒ NOTE:

The transfer will begin immediately and take approximately 5 minutes to complete. If you observe an "Are you sure" response from the frame, answer NO because you are performing an incorrect transfer. Re-enter the **UTL : :BMTR** command again, exactly as shown above.

12. Verify that the executables transferred correctly by entering the following command:

UTL : :QRY, MEMSTAT !

⇒ NOTE:

The FPKG values in the output of the **MEMSTAT** command will be identical for both the PMEM and SMEM.

13. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

⇒ NOTE:

Reset may take up to 30 minutes.

- If the system returns **COMPLD . . .** with error explanation, refer to *Trouble Identification* in Volume II.
- If the reset stops, refer to *Trouble Identification* in Volume II.

14. Verify that the upgrade was successful by entering the following command:

UTL : :QRY, FPKG !

15. You have successfully completed the feature package upgrade procedure.

Log-On/Log-Off

Log In to the System

Overview: This section provides the commands and explanation to enable a user to log on the frame and to log off the frame after a work session.

Each DACS II link can operate in two modes:

- **Login Security Mode.** This mode requires you to log in to the system with a *user id* and *passwd* before entering a specified set of commands. The frame administrator controls the specific commands that you can enter before you initially log on the system. He/she also sets the priority the system uses to execute your commands (or command groups). The administrator also sets other login characteristics such as output message screening, link language, and NPC numbering scheme. You will also be given a temporary password to use on your initial login. You should change your temporary password to a personal password (using the criteria below) during the initial login session.
- **Nonlogin Mode.** This mode allows anyone to use a specified command set assigned to the link *without logging in*. The link is automatically in this mode when not in the *Login Security Mode*. The frame administrator specifies the command set that can be used when operating in this mode.

If this is your initial login, review the following information about selecting a personal password that you can easily remember:

- A password must contain six to eight characters, at least two of which must be letters and one a number. Think of one that is meaningful to you and can be remembered without writing it down.
- To be effective, passwords should not be shared.
- You can change your passwords when desired. If you forget your password, the frame administrator can enable you to log on by assigning you another temporary password.

1. Enter the following command to log in to the system:

LOGIN:[FRM xy,SEQ ww]:USER <user id>[,PASSWD <pswd>]!

Where: xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<user id> = User identification (2 to 8 alphabetic characters)

<pswd> = Required for synchronous link to enter password. For asynchronous link, the login routine will prompt you for your password.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

2. If you want to see who is currently logged on, enter:

UTL::QRY,LOG[,ALL]!

The ALL option allows the frame administrator to see all users on the frame.

Log Off the System

1. Enter the following command to log off the system:

LOGOFF:[FRM xy,SEQ ww]:{USER <id>|LINK <link No.>}!

Where: xy = DACS II frame number (00 through ZZ).

ww = Command sequence number (00 through 49).

USER/LINK = Selects whether user ID or link number will be specified. Only the frame administrator can use the LINK option to log off a user from another link.

<user id> = User identification (2 to 8 alphabetic characters)

<link No.> = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

To forcibly log off another user, you must be logged in as the frame administrator and logged in on a different link. When trying to log off other users, DACS II does security level checking first. If you are not logged in as frame administrator, you will get a "D7 cannot execute privileged command" denial message.

Change Password

Overview: This procedure shows how users can change their passwords. When changing your password over a synchronous link, you can enter both the old and new passwords in the command; whereas, when changing your password over an asynchronous link, you must initiate a change routine and enter the old and new passwords when prompted.

1. After determining the type of link you are connected to, enter one of the following commands to change the password on that link:

Synchronous Link (X.25 Protocol):

If you are on a synchronous link (X.25 protocol), enter:

CHG:[FRM xy,SEQ ww]:
PASSWD,OLD <old pswd>,NEW <new pswd>!
giving the old and new passwords in the command.

Asynchronous Link (Snider Protocol):

If you are on an asynchronous link (Snider protocol), enter:

CHG:[FRM xy,SEQ ww]:PASSWD!

and respond to system prompts to enter old and new passwords.

2. If the command does not complete (**CHG LGN . . .COMPL** message received), find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Alternate Maps

the alternate map feature provides a way to quickly change customer cross-connections on the DACS II. the alternate map itself is a software file containing 2-way, 2-point cross-connections – TCONS only (do not use OCONS, BCONS, and TCNTS). When you activate an alternate map, the system simultaneously implements all the cross-connections defined by the map. This saves typing and speeds up the connections for quicker service switching.

The PIC option of the ED CRET MAP command allows you to make an alternate map by "taking a picture" of a defined group or set of the cross-connections that are currently active on the frame without entering each individual cross-connect command into the map.

Create Alternate Map

Overview: This procedure demonstrates how to create an alternate map.

⇒ NOTE:

Only users with USER IDs who access the system via a login can use the alternate map feature.

1. If you want to check link message screening to determine whether it needs to be changed temporarily to reduce interruption during the session, enter the following command and read the screening (SCR) option:

UTL::QRY,SCR,{LINK j[mm]|USER <user id>}!

USER|LINK = Selects whether user or link identification will be used in command

<user id> = User identification (2 to 8 alphabetic characters)

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If you want to change output screening, see *Change Output Message Screening* and enter the CHG SCR command.

2. Decide on a name for the alternate map. It can have up to seven alphanumeric characters, the first of which must be a letter; all letters must be capitalized.

3. Enter the following command to begin the alternate map session:

ED::MAP <name>!

Where: <name> = Name of new alternate map, consisting of up to seven alphanumeric characters starting with a letter.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
4. Enter TCON commands. You will receive an OK acknowledgment for each allowable entry. See Figure 7-2 for an example of map construction.
 - If NOT ALLOWED is received, the command is not allowed as an entry in an alternate map.

⇒ NOTE:

If you recognize an input error, you can delete the line (explained later) and enter another TCON. Similarly, if an error is indicated by the condition code after you end the session, you can open the file for editing and then delete and add TCONs.

⇒ NOTE:

When editing an existing map, you will not see previous entries.

```
ED::MAP NEWMAP!  
TCON::FROM 00101,TO 00201!  
TCON::FROM 00301,TO 00401!  
TCON::FROM 00501-24,TO 00601-24!  
END!
```

Figure 7-2. Example of Alternate Map

5. To terminate the create session, enter **END**. To abort the creation of the map, enter **QTEND**.

- If you do not receive a COND 00 response to the END command, study the conflicting TCON messages that accompany the completion message to determine what changes are needed and refer to *Edit an Existing Alternate/Reference Map* to make changes. The terminations for those TCONs may already be involved in other connections.

- If you want to see the contents of the alternate map, enter the appropriate command:

For TCONs:

UTL : : QRY, LIST, MAP <name>!

For NPCs:

UTL : : QRY, NPC, MAP <name>!.

Create Alternate Map Using the Picture Option

Overview: This procedure demonstrates how to create an alternate map using the picture option. To use the picture option, you must first create a *reference map*. This reference map identifies which of the active cross-connections on the frame are to be reproduced (pictured). These cross-connections are defined by using the ADD NPC command to list the NPCs in the reference map. After creating your reference map, create the new alternate map using the ED CRET MAP command with the PIC option.

⇒ NOTE:

Only users with USER IDs who access the system via a login can use the alternate map feature.

1. If you want to check link message screening to determine whether it needs to be changed temporarily to reduce interruption during the session, enter the following command and read the screening (SCR) option:

UTL : : QRY, SCR, {LINK j[mm] | USER <user id>}!

USER|LINK = Selects whether user or link identification will be used in command

<user id> = User identification (2 to 8 alphabetic characters)

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If you want to change output screening, see *Change Output Message Screening* and enter the CHG SCR command.

2. Decide on a name for the reference map. It can have up to seven alphanumeric characters, the first of which must be a letter; all letters must be capitalized.
3. Enter the following command to begin the reference map creation session:

ED::MAP <name>!

Where: <name> = Name of new reference map, consisting of up to seven alphanumeric characters starting with a letter.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

4. Enter the NPCs into the reference map using the following command:

ADD::NPC {<listing>|<range>}!

Where: <listing>|<range> = Listing is a listing of up to 10 NPCs separated by commas and the range is a continuous range of NPCs shown with a dash.

See Figure 7-3 for an example of map construction. When "OK" is received, enter the next component command (if any).

NOTE:

If you recognize an input error, you can delete the line (explained later) and enter another ADD NPC command. Similarly, if an error is indicated by the condition code after you end the session, you can open the file for editing and then delete and add ADD NPC command.

ED::MAP NEWMAP!
ADD::NPC 007-012!
END!

Figure 7-3. Example of a Reference Map

5. To terminate the create session, enter **END**. To abort the creation of the reference map, enter **QTEND**.
 - If you do not receive a COND 00 response to the END command, study the conflicting ADD NPC commands that accompany the completion message to determine what changes are needed and refer to the ED MAP portion of this procedure to make changes. The NPC for the other side of the connection may not have been added.

6. Enter the following command to create the new alternate map from the reference map:

ED::CRET,MAP <new name>,PIC <refmap>!.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
- If the system returns **COMPL with no conditions**, the new map contains all circuits that are currently in place in the system for the NPCs in the reference map.
- If the system returns **COMPL with condition**, some of the circuits could not be included in the new map (for example, could be multipoint).

7. If you want to see the contents of the alternate map, enter the appropriate command:

For TCONS:

UTL::QRY,LIST,MAP <name>!

For NPCs:

UTL::QRY,NPC,MAP <name>!.

⇒ NOTE:

Once the new map is created, it can be changed as described in *Edit an Existing Alternate/Reference Map*. The picture feature only picks up cross-connections defined by the reference map that are currently on the frame. It does not simply copy what is in the reference map. If you want two copies (one to keep unchanged and one to modify), you will have to use the picture option twice to create two different new maps.

Edit an Existing Alternate/Reference Map

Overview: This procedure demonstrates how to edit an existing alternate map or reference map.

⇒ NOTE:

Only users with USER IDs who access the system via a login can use the alternate map feature. User DAX can edit the maps owned by other users.

⇒ NOTE:

When editing an existing map, you will not see the previous entries. To view the contents of a map, use the command **UTL::QRY,LIST,MAP <name>!**, where <name> is the name of the map.

1. If you want to check link message screening to determine whether it needs to be changed temporarily to reduce interruption during the session, enter the following command and read the screening (SCR) option:

UTL::QRY,SCR,{LINK j[mm]|USER <user id>}!

USER|LINK = Selects whether user or link identification will be used in command

<user id> = User identification (2 to 8 alphabetic characters)

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If you want to change output screening, see *Change Output Message Screening* and enter the CHG SCR command.

2. Enter the following command to begin the editing session:

ED::MAP <name>!

Where: <name> = Name of map to be edited; the map must already exist (must have been created).

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. Use the following items to change the alternate map as required:

— **Add New Cross-Connections.** Enter the complete TCON commands (which are appended to the map).

— **Remove Cross-Connections.** Enter the following to remove TCONs from an alternate map:

TCON::FROM <npc No.1>ddd[-eee],TO <npc No.2>jjj[-kkk],DEL!.

Where:

<npc No.1> = NPC number on the FROM side of connection to be deleted.

<npc No.2> = NPC number on the TO side of connection to be deleted.

ddd/jjj = Channel number.

eee/kkk = Optional, last channel number in a range of channels.

— **Add NPCs to Reference Map.** Enter the following command to add NPCs to a reference map:

ADD::NPC {<listing>|<range>}!

- **Remove NPCs from a Reference Map.** Enter the following command to remove NPCs from a reference map:

DLT::NPC {<listing>|<range>}!

Where: <listing or range> = Listing is a listing of up to 10 NPCs separated by commas and the range is a continuous range of NPCs shown with a dash.

⇒ NOTE:

Only NPCs that were explicitly added via the ADD NPC can be deleted via the DLT NPC. If the subject map is currently active on the frame, the changes will not be implemented in the network until the map is activated again.

4. To terminate the edit session, either enter **END** to write the changes into the map or enter **QTEND** to disregard all the changes and quit the edit mode. The QTEND occurs automatically if the link fails or if you are forced off the system.
 - If you do not receive a COND 00 response to the END command, study the conflicting TCON messages that accompany the completion message to determine what changes are needed. The terminations for those TCONs may already be involved in other connections or the NPC for the other side of the connection may not have been added.
 - Enter the appropriate command to see the contents of the alternate map:

For TCONs:

UTL::QRY, LIST, MAP <name>!

For NPCs:

UTL::QRY, NPC, MAP <name>!.

Activate Alternate Map Package

Overview: This procedure is used to activate an alternate map. The alternate map is a set of 2-way, 2-point cross-connections that are quickly implemented when the map is activated. Activating the alternate map will not affect the existing cross-connections that are not involved in the alternate map. However, activating the new map will overwrite the cross-connection of all involved terminations.

To make sure that only the cross-connections listed in the alternate map are established on the involved NPCs you can activate the map with the CLR option. This option causes the system to disconnect existing connections on the

involved NPCs before making the cross-connections listed in the map.

**CAUTION:**

Performing this procedure incorrectly can interrupt service.

Perform each step of the procedure in the order given. Also, read all supplementary information (such as Notes) before executing commands.

1. Enter the following command if you want to see the contents of the alternate map first:

UTL::QRY,LIST,MAP <name>[,USER <user id>]!

or enter the following to list NPCs:

UTL::QRY,NPC,MAP <name>[,USER <user id>]!

Where:

<name> = Map name

<user id> = Optional, to allow frame administrator to see another user's (given by user ID) map.

2. Enter the following command to activate the map (see note before using the CLR option):

ACT::MAP <name>[,CLR][,INCL]!

Where:

<name> = Alternate map name

CLR = Optional, to cause all connections associated with the NPCs of the named map to be disconnected before the map is implemented (see Note)

INCL = Optional, to overwrite CUS or RDS circuits along with the other connections.

**NOTE:**

Note the following considerations concerning the CLR option for the activate map command:

- The CLR (and the map itself) only affects 2-way, 2-point cross-connections (TCONs); other types of connections will not be disconnected.
- Care should be taken with the CLR option because it will cause all cross-connections on NPCs involved in the alternate map to be disconnected. Connections on NPCs not involved in the alternate map will not be affected (the whole frame will not be cleared).

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
 - If the system returns a nonzero COND code in the completion message, a connection other than a 2-way type cross-connection exists on the involved NPCs, and this connection was not cleared. The named NPC is the first one that contains such connections.
3. Watch for DNY messages while the map is being executed. You can reenter the denied connections using the cross-connect command. After the cause of the denial is found, you can edit the alternate map to correct the cross-connections for the next time the map is activated.
 4. Enter the following command to see the alternate map connections for the involved NPCs:

UTL::QRY,CMAP <npc No.>[-<range>]!

Where:

<npc No.> = NPC number, either extended (for example, [0]001)
or hierarchical (for example, 01101).

<range> = Optional, last NPC of a continuous range.

Enter Command to Query User Map Information

Overview: This procedure shows how to retrieve alternate map information from the system.

1. Enter the appropriate command for the information you are looking for:
 - **Filename List and Execution Attributes:**
UTL::QRY,MAP,ATTR[, {USER <user id>|ALL|MAPNM <name>}]!
 - **Contents of the Map:**
UTL::QRY,LIST,MAP <name>[,USER <user id>]!
 - **Listing of NPCs in the Map:**
UTL::QRY,NPC,MAP <name>[,USER <user id>]!
 - **Allotted Map File Storage Space:**
UTL::QRY,MAP,SPACE[, {USER <user id>|ALL|SYSTEM}]!.

Where:

<user id> = User identification (2 to 8 alphabetic characters).

<name> = Name of the map file.

ALL = Allows the frame administrator to see all files on the frame.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Delete Alternate Map from System

Overview: This procedure gives the command to delete an alternate map package from the system. If you have already activated the alternate map, the delete command will not disconnect the component connection; it only removes the map name and definition. Only the system administrator can delete maps created by other users. Users can only delete their packages; the command will not affect a map with the same name that belongs to another user.

1. Enter the following command if you want to examine the alternate map before deleting:

UTL::QRY,LIST,MAP <name>[,USER <user id>]!

Where:

<name> = Name of the map file

<user id> = Optional, to allow frame administrator to address other users (given by user ID) package.

2. Enter the following command to delete the file:

DLT::MAP <name>[,USER <user id>]!

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Macros

A *macro* is a package of component commands that are executed in sequence when the macro command is executed. they save typing time because you can execute the same macro time and again. Also, the frame administrator can create public macros for the benefit of all users.

You can also create *universal* macros. With the use of universal macros, the same macro can be used to perform similar jobs on different equipment without changing the macro itself. Universal macros use variables in the component commands within the macro. You then specify the values of the variables within the command that executes the macro.

the system executes each component command within the macro according to its priority compared to commands from other users.

Create/Edit Macro

Overview: This procedure demonstrates how to create a macro and how to edit a macro.

NOTE:

You must use login access to the frame to create or edit a macro because the ownership of the macro is established by user ID.

1. If you want to check link message screening to determine whether it needs to be changed temporarily to reduce interruption during the session, enter the following command and read the screening (SCR) option:

UTL::QRY,SCR,{LINK j[mm]|USER <user id>}!

USER|LINK = Selects whether user or link identification will be used in command

<user id> = User identification (2 to 8 alphabetic characters)

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If you want to change output screening, see *Change Output Message Screening*. Users can change their own message screening. Messages entered during the macro session do not appear on other links.
- If you want to change message language, see *Change Message Language*.

- If you want to change NPC addressing, see *Change NPC Addressing*.
2. If you are editing an existing macro, go to Step 4.
 3. Decide on a name for the macro using the following rules:
 - Names can have up to seven alphanumeric characters, the first of which must be a letter.
 - All letters must be capitalized.
 - For *public-use* macros, the first letter must be an upper-case "P". (Only the frame administrator—user DAX—can create a public macro.)
 4. Enter the following command to begin creating or editing a macro:

ED::MACRO <name>!

where: <name> is the macro name.

⇒ NOTE:

Before editing the macro, wait for the message giving the number of lines; with large macros (around 8,000 lines), entries can be lost while the DACS II is verifying the number of existing lines.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
5. Use the following *macro package editing commands* to create or modify your macro package. See Example 1 at the end of this procedure for help. Example 2 shows how to create a *universal macro*. (For new macros, you can simply enter the required command lines.)
 - **APPEND Command.** This command allows you to "append" new lines *after* the line specified. When beginning a new macro, append after line 0.

APPEND::!
 - **DELETE Command.** This command allows you to delete the line specified.

DELETE::!

⇒ NOTE:

After deleting a line, the remaining line numbers after the deleted line will change. For example, if you have 5 lines and delete line 4, line 5 will become line 4. Use the **LIST** command to see the contents of macro.

- **MOVE Command.** This command allows you to move a line (or group of lines) to a place *after* a specified line.

**MOVE::FROM {<starting line>|END}[-{<ending line>|END}],
TO {<destination line>|END}!**

- <starting line> - Starting component command line number indicating the beginning of a component command line range to be moved. This can also be a single line number for moving single lines.
- <ending line> - Ending component command line number indicating the end of a component command line range to be moved.
- END - Last line in the macro file. End cannot be used in both parts of the command (starting line and the ending line or destination line).
- <destination line> - Component command line after which the component commands are moved. Use 0 to move lines *before* line 1.

- **LIST Command.** This command lists the lines or range or lines specified. To list all the lines in the macro, enter **LIST!**.

LIST::{<starting line>|END}[-{<ending line>|END}]!

⇒ **NOTE:**

Consider the following when constructing macros:

- CHG MCON/MCOFF commands can be included in a macro to shut off (MCOFF) macro component COMPL messages.
 - A STOP keyword can be included in component RMV/RST, TCON, and TDIS commands to stop the macro if a component command fails.
- If BAD SYNTAX or other denial is received, reenter corrected command. If NOT ALLOWED is received, the command is not allowed either because it has to do with macros itself (for example, ED, EXC), or users (for example, LOGOFF), or link/user authorization.
 - When "OK" is received, make next addition or move to different line and make any other changes. The system appends !OK to each valid command line in the macro.

- To store changes without quitting the session, enter **SAVE!**. To abort the macro session without storing changes, enter **QTEND!**.

**NOTE:**

As usual, the on-line help can be invoked while entering a component line to the macro using the "?".

6. After all components have been entered, enter **END!** to terminate the session. The DACS II should respond with MACRO ...COMPL message with COND 00 exceptions.

Example 1: This example shows how to create a macro. Figure 7-4 shows the component commands in the macro that do the following:

- **Line 1.** This command disconnects channel 01 of NPC 001 from channel 01 or NPC 003. If the command fails, the macro stops.
- **Line 2.** This command cross-connects channel 01 of NPC 001 to channel 01 or NPC 005.
- **Line 3.** This command cross-connects channel 02 of NPC 001 to channel 02 or NPC 005.
- **Line 4.** This command cross-connects channel 03 of NPC 001 to channel 03 or NPC 005.
- **Line 5.** This line outputs all connections on NPC 001.

```
TDIS::FROM 00101, TO 00301, STOP!OK
TCON::FROM 00101, TO 00501!OK
TCON::FROM 00102, TO 00502!OK
TCON::FROM 00103, TO 00503!OK
UTL::QRY, CMAP 001!OK
```

Figure 7-4. Example of Macro (Extended NPC Numbering)

Example 2: Figure 7-5 shows a universal macro that, when executed with the variable values, does the same thing as the macro in Example 1. There may be as many as ten variables listed in one macro. The variables are entered as #01 through #10 in the message. Variables may be used for any parameter except action verbs and punctuation, and includes user ids, NPCs, channel numbers, trunk conditioning codes, etc. Variables are unique to a macro, that is, variable #01 may be used more than once in a macro to repeat the same value several times. Variable #01 may be used in another macro with an entirely different meaning.

**NOTE:**

To represent hierarchical NPC numbers, a variable must be used for each

part of the number. For example, if variables #01, #02, and #03 were used to represent NPC 01101, the last line entered in the example would be:

UTL::QRY,CMAP #01#02#03!

The following command (with extended NPC number values 001 and 005) would be entered to execute the macro in the example:

EXC::MACRO QWKCON, (001,005)!

TDIS::FROM #0101, TO 00301, STOP!OK

TCON::FROM #0101, TO #0201!OK

TCON::FROM #0102, TO #0202!OK

TCON::FROM #0103, TO #0203!OK

UTL::QRY,CMAP #01!OK

Figure 7-5. Example of Macro (Extended NPC Numbering)

Execute Macro Package

Overview: This procedure is used to execute a macro package. If the frame administrator has established the priority of command execution, the component commands of the macro will determine when a macro is executed relative to other macros. The overall success of the macro execution is indicated by a final COMPL or DNY message. Macros can include a STOP keyword on the component line to stop the macro if critical components fail. Macros can also be aborted by entering the STOP command after the macro is running.

1. Enter the following command if you want to see the contents of the macro before executing:

UTL::QRY,LIST,MACRO <name>[,USER <user id>]!

Where:

- <name> = Macro name
- <user id> = Optional, to allow frame administrator to see another user's macro.

- If CHG MCOFF and CHG MCON commands are not included in the macro and you want to shut off component command completion messages, enter:

CHG::[USER <user id>|LINK j[mm]],MCOFF!

Where:

<user id> = User identification (2 to 8 alphabetic characters)

j[mm] = Physical link number (1 through 6) and virtual circuit (mm = 01 through 16) for synchronous link.

- If you want to stop the execution of the macro after it has started (in the next step), enter:

STOP::MACRO[,LINK j[mm]]!

Where: j[mm] = Required by user to stop execution on link being used. Frame administrator can stop the execution of the macro on any link.

2. Enter the following command to execute the macro:

EXC::MACRO <name>[, (p1,p2,p3, . . . p10)]!

Where: p1,p2,p3 = Values for variables identified by numbers in the component commands; can also include special keyword "NULL" for variable and "STOP" at end of line.

The following example shows how NPC numbers (extended numbering) and the STOP keyword would be entered for variables used in the macros:

EXC::MACRO QWKCON2 (641,001,002,003,STOP)!

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).
- If CHG MCOFF was entered before executing the macro, enter:

CHG:: {USER <user id>|LINK j[mm]},MCON! to allow completion messages again.

Enter Command to Query User Macro Information

Overview: This procedure shows how to retrieve macro information from the system.

1. Enter the appropriate command for the information you are looking for:

- **Filename List:**

UTL : : QRY, MACRO, ATTR[, {USER <user id>|ALL}]!

- **Contents of the Macro:**

UTL : : QRY, LIST, MACRO <name>[, USER <user id>]!

- **Allotted Map/Macro File Storage Space:**

**UTL : : QRY, MACRO, SPACE\
[, {USER <user id>|ALL|SYSTEM}]!**

Where:

<user id> = User identification (2 to 8 alphabetic characters).

<name> = Name of the macro file.

ALL = Allows the frame administrator to see all files on the frame.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

Delete Macro from System

Overview: This procedure gives the command to delete a macro package from the system. Only the system administrator can delete macros created by other users. Users can only delete their packages; the command will not affect a macro with the same name that belongs to another user.

1. Enter the following command if you want to examine the macro file before deleting it:

UTL::QRY,LIST,MACRO <name>[,USER <user id>]!

Where:

<name> = Name of the macro file

<user id> = Optional, to allow frame administrator to address other users (given by user ID) package.

2. Enter the following command to delete the file:

DLT::MACRO <name>[,USER <user id>]!

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

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Software Installation

Software Installation Procedure (New Frame)

For the procedure to install a new software release, refer to the *DACS II Release 8.0 Software Release Description*.

Database Archiving Procedures

The need (and how often) to archive the DACS II database is determined by your local requirements (usually tied to the frequency of changes to the database). The archived copies (flash cards) should be stored in a safe place also determined by your local requirements. The copy should be labeled indicating the DACS II frame it backs up and the date and time the archive copy was retrieved from the frame.

The procedure to archive the database and executables allows you to recover from one or more of the following:

- Failed PMEM and/or SMEM hardware, that may leave the database on either (or both) the SMEM and PMEM flash cards suspect.

The "archive" card resulting from these procedures is in effect the current SMEM card located in the DACS II frame. These procedures will remove and declare the SMEM flash card as the latest "archive" card. The remainder of the procedure involves inserting another flash card into the SMEM slot and mirroring PMEM to the new SMEM card.

If inserting a new or "blank" flash card into the SMEM slot, the mirroring process (PMEM to SMEM) can take up to 10 or more minutes to complete (depending upon the size and configuration of your frame). The mirroring process is accomplished by restoring the SMEM card manually while the MC is in-service. During this process, the MC is available to process a subset of input commands if the BKGRND keyword was used as part of the **RST : :SMEM** command.

This procedure assumes the MC, PMEM, and SMEM are functioning properly and the database in RAM and on PMEM are correct.

Database Archiving Procedure

Use the following procedure to obtain an archive copy when the MC is in the IS state:

1. At the archive storage location—
Retrieve the oldest archive copy (flash card) that you want to reuse.

**NOTE:**

If an archive flash card is not available or does not exist, find a new or blank card that is DACS II compatible.

2. Verify that the MC and SMEM are in-service by entering the following command:

UTL : : QRY, MEMSTAT !

- If the MC and SMEM are in service—
Go to Step 4.
- If the MC is out-of-service (RAM state field in MEMSTAT output)—
Enter the following command:

RST : : MC !

- Reissue the command **UTL : : QRY, MEMSTAT !**. If the SMEM is in-service proceed to Step 4.

3. If the SMEM is out-of-service—
First copy the journal files to PMEM:

UTL : : BMTR, FROM RAM, TO MEM!

Then restore SMEM in the background:

RST : : SMEM, BKGRND !

When this command completes, SMEM is a mirror image of PMEM, suitable for archiving. Proceed to the next step.

4. Ensure that any previously entered **RST** command for SMEM has completed.
5. Remove the SMEM card logically by issuing the command:

RMV : : SMEM !

When this command completes, place the ESD grounding strap on your wrist and physically remove the SMEM card from the CPU2. Figure 8-1 shows the memory card locations on the CPU2 circuit pack.

6. Label the just removed SMEM card as the latest archive card (with the frame information, date/time, when it was removed) and store it in the proper place for archive cards.

**NOTE:**

This is now the latest "archive" card.

7. Insert the card retrieved in step 1 (the "oldest archive" card), into the SMEM slot. Use a blank card if the oldest archive card is not available.
8. Enter the following command to restore the SMEM card to service:

RST : : SMEM, BKGRND !

**NOTE:**

The system executables and the database on the PMEM card will be copied onto the SMEM card such that each card is a mirrored image of the other.

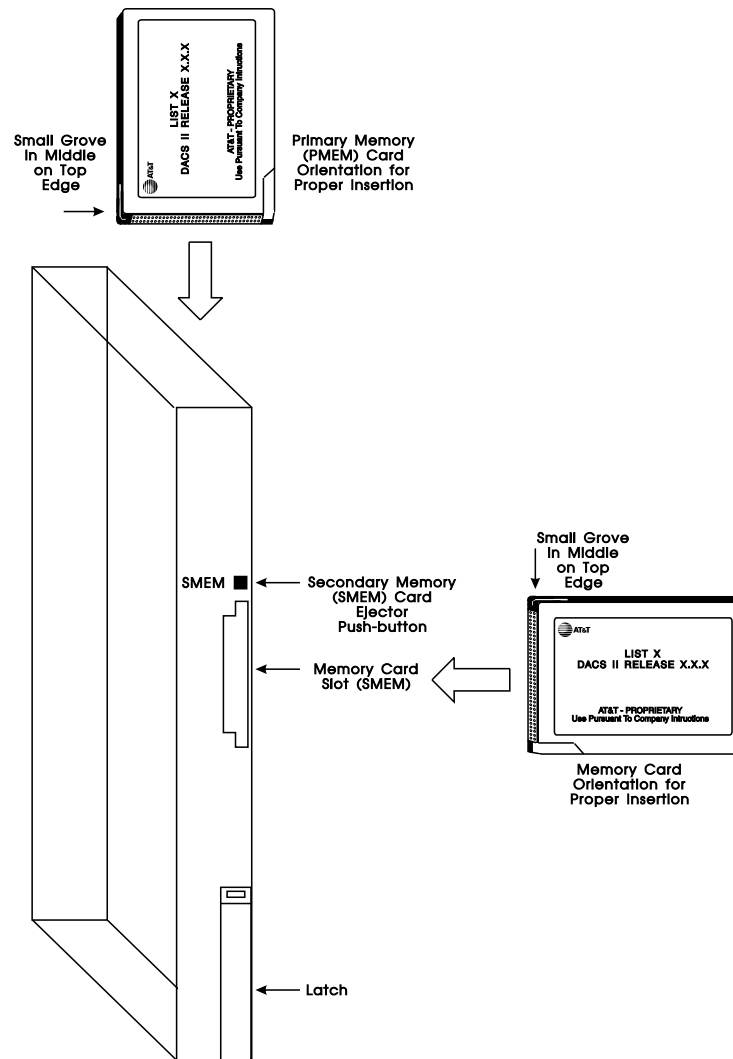


Figure 8-1. Memory Card Locations on CPU2

Memory Card Failure Recovery Procedure

The recovery procedure when a PMEM or SMEM card failure occurs is as follows:

1. Perform the following diagnostic tests on both the PMEM and SMEM cards:
 - a. Do the card diagnostic test, craft code X'0004.
 - b. Do the validate data base test, craft code X'0010.
 - c. Validate the boot block, craft code X'0020.
 - d. Validate executable header, craft code X'0040.
 - e. Validate executables, craft code X'0080.

Several possible cases can result from this set of tests that lead to different actions to resolve the problems:

- a. If the PMEM card fails card diagnostics and the SMEM card passes all tests, then go to Step 2.
 - b. If the PMEM card succeeds on the card diagnostic test, but fails any of the other tests, while the SMEM card succeeds on all tests, then go to Step 3.
 - c. If the PMEM and SMEM card both succeed on the card diagnostic tests, but both fail on one of the other diagnostic tests, then go to Step 4.
 - d. If the SMEM card fails card diagnostics and the PMEM card passes all tests, then go to Step 5.
 - e. If the SMEM card passes card diagnostics, but fails any of the other tests, while the PMEM card succeeds on all tests, then go to Step 6.
2. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to be defective):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service..
 - c. Replace the PMEM card with the card currently in the SMEM slot.

- d. Insert a spare memory card into the SMEM slot.
- e. Physically insert the CPU2 pack into the frame.
- f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
- g. The System should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, discard the bad PMEM card and continue with Step 7.

If PMEM fails to boot, run diagnostics on the PMEM card. The card diagnostic tests (craft code X'0004) will most likely fail, because the problem is most likely a PMEM card connector problem and the CPU2 board itself should be replaced. The system should be rebooted with the PMEM and SMEM cards in their original slots but with a new CPU2 pack.

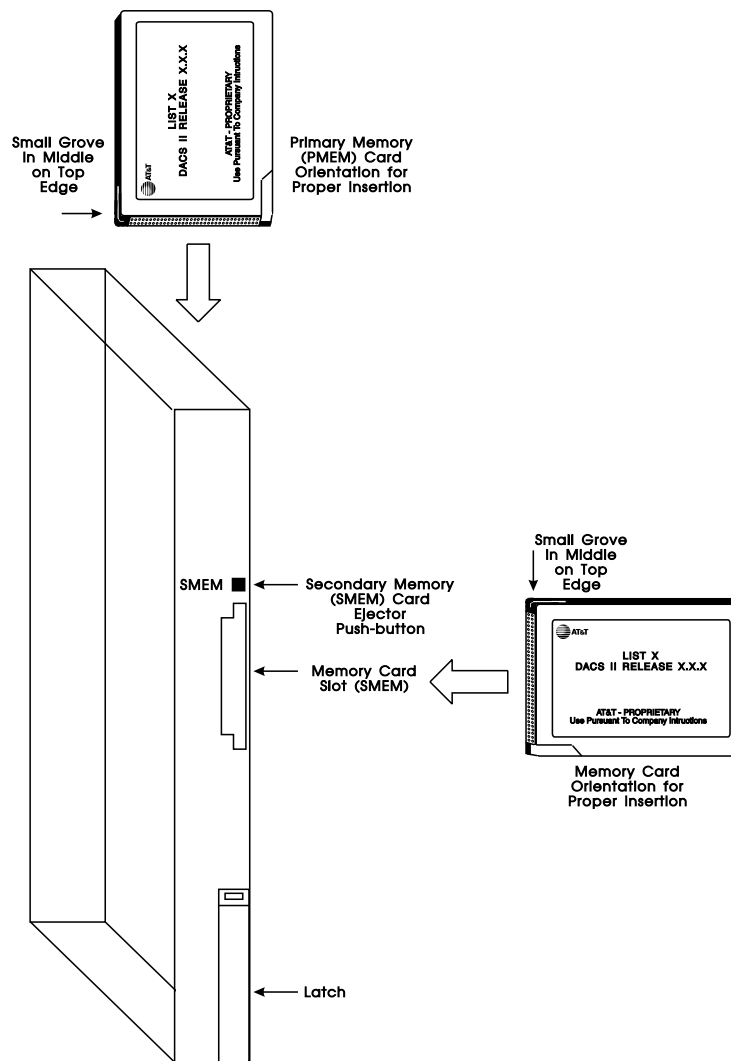


Figure 8-2. Memory Card Locations on CPU2

3. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the card currently in the SMEM slot.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The system should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, continue with Step 7. (The old PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card (Figure 8-2) with the most recently archived memory card by doing the following (PMEM and SMEM cards are suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the most recently archived memory card.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The System should be brought into service with the correct version of the executables and a valid but most likely not current database. If the boot completes successfully, continue with Step 7. (The PMEM card and the SMEM card may be recycled as future SMEM cards.)

5. Replace the SMEM card (Figure 8-3) with a spare memory card or with an older archive card that may be recycled. (SMEM card is suspected to be defective.):
 - a. Remove the SMEM card physically from the CPU2 card. (Since the card has been found to be defective by the system, it must already be logically removed from the system.)
 - b. Insert the spare memory card physically into the SMEM slot.
 - c. Discard the bad SMEM card and continue with Step 7.
6. The SMEM card is good but has bad information on it.
Restore the SMEM card:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a “mirrored image” of the other.

RST : : SMEM, BKGRND !

If the command is denied because of bad or mismatching information on the SMEM card with the message:

Warning: The SMEM Card being restored has the following problems!
<message describing the problem>
If YOU STILL WISH TO PROCEED, USE FRC OPTION

Then use the command with the **FRC** option:

RST : : SMEM, FRC, BKGRND !

You will get a response:

ARE YOU SURE? (YES/NO)

Answer YES and the restore operation should complete. Then go to Step 8.

7. To restore the SMEM card, enter the following command:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a "mirrored image" of the other.

RST : : SMEM, BKGRND !

8. If there is now a replacement card in the PMEM slot, then the PMEM may not contain the latest db changes, depending on which replacement card was used. Any changes not present need to be re-done.
9. Create a new archive copy if needed (archived copy was used to replace the PMEM). Refer to the "Database Archive Procedure" (Volume 1).

Repair and Replacement

Remove and Install Circuit Packs

The DACS II contains 4-, 8-, 12-, and 16-inch circuit packs. These circuit packs have the following design:

- **Single Latch:** These are the 4- and 8-inch circuit packs. Most of the circuit packs contained in the system are of this design.
- **Double Latch:** These are the 12-inch DS3U and 16-inch ECCN circuit packs. Each circuit pack has two latches; one on the top and one on the bottom.

You can easily damage circuit packs and other hardware by improperly removing and installing them in the frame. Read Cautions before beginning.



CAUTION:

Before touching any part of the equipment frame including the PMEM or SMEM cards, any circuit pack, reset switches, ACO or LED TEST buttons, ALWAYS ground yourself to the frame with a WRIST STRAP provided with the equipment.



CAUTION:

Never install or remove more than one circuit pack at a time. This could cause irreparable damage to each circuit pack.



CAUTION:

No circuit card nor the SMEM memory card should be physically removed from the frame or inserted into the frame while a frame reset or reboot is in progress.

The following sections explain how to remove and install the two different types of circuit pack designs.

Remove and Install Single-Latch Circuit Packs

The following procedures describe how to correctly remove and install 4- and 8-inch circuit packs with a single latch:

 NOTE:

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND). Entities such as UCs, FTMLs, and FCs should be OOS before they are physically removed/replaced.

— **To Remove a Circuit Pack:**

1. Unseat the circuit pack from the slot by carefully operating the latch.
2. Then remove the circuit pack with one continuous motion. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

— **To Install a Circuit Pack:**

1. Remove the plastic shipping protector from the contacts of new circuit packs.
2. Insert the circuit pack into the slot. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.
3. Raise the latch. Push on the bottom part of the circuit pack until the latch engages the slot. DO NOT push with the latch.
4. After the latch engages the slot, close the latch (pull up) to seat the circuit pack.
5. After closing the latch, with one thumb on the latch and the other thumb at the top of the circuit pack, press firmly to ensure that the circuit pack is fully seated.

Remove and Install Double-Latch Circuit Packs

The following procedures describe how to correctly remove and install 12-inch DS3U and 16-inch ECCN circuit packs with double latches:

 NOTE:

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND).

— **To Remove a Circuit Pack:**

1. Unseat the circuit pack from the slot by carefully operating both the top and bottom latch together.

2. Then remove the circuit pack with one continuous motion. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH.

— **To Install a Circuit Pack:**

1. Remove the plastic shipping protector from the contacts of new circuit packs.
2. Insert the circuit pack into the slot and ensure that the latches are positioned to allow insertion. DO NOT ROCK THE CIRCUIT PACK BACK AND FORTH. Open both latches (Top - push up, Bottom - push down).
3. Push on the bottom part of the circuit pack until both latches engage the slot. DO NOT push with the latches.
4. After the latches engage the slot, close the latches (pull up top latch, push up lower latch) together to seat the circuit pack.
5. After closing the latches, with one thumb on the top latch and the other thumb at the top latch, press firmly to ensure that the circuit pack is fully seated.

Upgrade Circuit Packs

Upgrading From a CI to a ECI/HECI

Overview: This procedure is used for two purposes:

- To upgrade from a Communication Interface (CI) circuit pack to either an Enhanced Communication Interface (ECI) circuit pack or a High-speed Enhanced Communication Interface (HECI) circuit pack.
- To upgrade from an Enhanced Communication Interface (ECI) circuit pack to a High-speed Enhanced Communication Interface (HECI).

This procedure assumes that links 1 through 6 are all provisioned. For a CI circuit pack, links 1 through 6 can only be Snider links. For a ECI/HECI, links 1 and 2 can only be Snider, links 3 and 4 can either be Snider or TABS, and links 5 and 6 can only be X.25. This procedure is implemented on Link 1.

1. Enter **RST : :MC, MCOND!** to place the frame in maintenance condition.
2. Replace the CI circuit pack with an ECI/HECI circuit pack or replace the ECI circuit pack with an HECI circuit pack.
3. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.



NOTE:

Reset may take up to 30 minutes.

If MC RESET COMPL (with no COND code) is received, then continue with the next step.

If MC RESET COMPL (with COND code) is received, refer to *DACS II - Operation and Maintenance Manual, Volume II - Trouble Clearing* to clear reset conditionally.

4. Link 1 can now be changed back to the preferred baud rate, if necessary:

ADD::LINK 1,PTCOL {S|X|T|M}[,BAUD bb]!

Where:

LINK = Link

PTCOL = Protocol.

S = SSCSAI (Snider protocol)

X = X.25 Synchronous protocol

T = TABS (Telementary Asynchronous Block Serial protocol)

M = Modified Snider protocol. Requires a baud rate of 1200.

BAUD = Baud

bb = Baud rate.

bb	Rate
03	300
06	600
12	1200
24	2400
48	4800
96	9600

Change the baud rate on the terminal setup so that it matches the link.

5. Remove links 3,4,5, and 6 using the following command:

RMV::LINK j!

Where:

LINK = Link

j = Link number. (1 through 6)

6. Change Link 1 to 1200 Baud using the following command:

ADD::LINK 1,PTCOL S,BAUD 12!

Change the terminal setup to 1200 so that it matches the link.

7. (For upgrading from Communication Interface (CI) circuit pack only. Skip this step if upgrading from an ECI circuit pack to an HECI circuit pack.)

Change links 5 and 6 to X.25 protocol (change links 3 and 4 to TABS if necessary) using the following command:

ADD::LINK j,PTCOL X[,BAUD bb]!

8. Enter the following command to restore the links:

RST::LINK j!

Where:

LINK = Link

j = Link number (1 through 6).

Replacing an ECI/HECI With a CI

Overview: This procedure is used to replace an Enhanced Communication Interface (ECI) circuit pack or a High-speed Enhanced Communication Interface (HECI) circuit pack with a Communication Interface (CI) circuit pack. This procedure assumes that links 1 through 6 are all provisioned. For a CI circuit pack, links 1 through 6 can only be Snider links. For a ECI/HECI, links 1 and 2 can only be Snider, links 3 and 4 can either be Snider or TABS, and links 5 and 6 can only be X.25. This procedure is implemented on Link 1.

1. Enter **RST : :MC, MCOND** to place the frame in maintenance condition.
2. Replace the ECI/HECI circuit pack with a CI circuit pack.
3. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.



NOTE:

Reset may take up to 30 minutes.

If MC RESET COMPL (with no COND code) is received, then continue with the next step.

If MC RESET COMPL (with COND code) is received, refer to *DACS II - Operation and Maintenance Manual, Volume II - Trouble Clearing* to clear reset conditionally.

4. Link 1 can now be changed back to the preferred baud rate, if necessary:

ADD : :LINK 1, PTCOL {S|X|T|M}[, BAUD bb] !

Where:

LINK = Link

PTCOL = Protocol.

S = SSCSAI (Snider protocol)

X = X.25 Synchronous protocol

T = TABS (Telementary Asynchronous Block Serial protocol)

M = Modified Snider protocol. Requires a baud rate of 1200.

BAUD = Baud

bb = Baud rate.

bb	Rate
03	300
06	600
12	1200
24	2400
48	4800
96	9600

Change the baud rate on the terminal setup so that it matches the link.

5. Remove links 3, 4, 5, and 6 using the following command:

RMV::LINK j!

Where:

LINK = Link

j = Link number. (1 through 6)

6. Change Link 1 to 1200 Baud using the following command:

ADD::LINK 1,PTCOL S,BAUD 12!

Change the terminal setup to 1200 so that it matches the link.

7. Change links 5 and 6 to Snider protocol (change links 3 and 4 to TABS if necessary) using the following command:

ADD::LINK j,PTCOL S[,BAUD bb]!

8. Enter the following command to restore the links:

RST::LINK j!

Where:

LINK = Link

j = Link number (1 through 6).

Upgrading From an EMTC to an EMTC2

Overview: This procedure is used to replace the UM56 Enhanced Maintenance (EMTC) circuit pack to a UM75 Enhanced Maintenance (EMTC2) circuit pack.

1. Enter **RST::MC,MCOND!** to place the main controller in maintenance condition.

2. Replace the UM56 circuit pack with a UM75 circuit pack.
3. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

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2.048-Mb/s Performance Parameters

The following sections contain performance parameters applicable to 2.048-Mb/s facilities.

Near-End 2.048-Mb/s Error Count

DACS II accumulates/calculates the following Near-End error count parameters for a PA type NPC:

- **Code Violation Count (CV)** – The CV count is incremented every time a code violation is detected. DACS II monitors and accumulates the CV in addition to converting it into an error rate estimate for alarm reporting purposes.
- **Framing Error Count (FRER)** – The FRER count is incremented every time a framing error is detected. DACS II monitors and accumulates the FRER in addition to converting into an error rate estimate for alarm reporting purposes.
- **CRC Block Error Count (CRC)** – The CRC count is incremented every time a CRC block error is detected. DACS II monitors and accumulates the CRC.



NOTE:

For type PA NPCs with automatic CRC-4 mode, the CRC count shall not be accumulated when an LMA is declared.

- **Unavailable Time Count (UATC)** – A period of Unavailable Time (UAT) begins when the bit error ratio in each second is worse than 1×10^{-3} for a period of ten consecutive seconds. These ten seconds are considered to be unavailable time. A new period of available time begins with the first second of a period of ten consecutive seconds each of which has a bit error ratio better than 1×10^{-3} . The UATC count is incremented every time an unavailable time period is entered.

Near-End 2.048-Mb/s Errored Intervals

DACS II accumulates/calculates the following Near-End errored interval parameters for a type PA NPC:

- **Controlled Slip Seconds (CSS)** – The CSS is incremented for every one-second interval with one or more slip defects.
- **Out of Frame Second (OFS)** – The OFS is incremented for every one-second interval with one or more LOF defects. Continuous LOF defects are counted as one LOF defect.
- **Errored Seconds (ES)** – The ES is incremented for every one-second interval with one or more of the following defects:
 - One or more code violations
 - One or more slips
 - One or more LOSSs
 - One or more LOFs
 - One or more framing errors
 - One or more errored CRC block
- **Severely Errored Seconds (SES)** – The SES is incremented for every one-second interval with one or more of the following defects:
 - 2048 or more code violations
 - One or more slips
 - One or more LOSSs
 - One or more LOFs
- **Unavailable Seconds (UAS)** – The UAS is incremented for every one-second interval in a UAT period.
- **TS16 Performance** – DACS II continuously monitors and accumulates the Multiframe Alignment Error Count (MER) for a type PA NPC provisioned with CAS. The MER is incremented when one or more errors are detected in the "0000" signaling multiframe alignment signal of TS16.

Near-End 2.048-Mb/s Error Ratio Parameters

DACS II calculates the following error ratio parameters for framed type PA NPCs:

- **Errored Seconds Ratio (ESR)** – The ESR is 100 times the number of ES divided by the total AS during a measurement interval.
- **Severely Errored Seconds Ratio (SESR)** – The SESR is 100 times the number of SES divided by the total AS during a measurement interval.
- **Background Block Error Ratio (BBER)** – The BBER is the number of BBES divided by the total block count during a measurement interval excluding all blocks during SES and UAT.

Far-End Performance Parameters for a 2.048-Mb/s Facility

For framed 2.048-Mb/s facilities with far-end monitoring mode enabled, DACS II accumulates/calculates the following far-end performance parameters:

- **Far-End Block Error Count (FEBE)** – The FEBE is an error count parameter that is incremented every time that an E bit is received with a binary value of "0".
- **Far-End Errored Seconds (FES)** – The FES is incremented for every one-second interval with one or more far-end block error.
- **Far-End Severely Errored Seconds (FSES)** – The FSES is incremented for every one-second interval with 100 or more far-end block errors.
- **Far-End Unavailable Seconds (FUAS)** – If 10 consecutive FSESs are detected, the FE is declared as Unavailable, and these 10 FSESs are not counted as FSES. Instead, these 10 seconds are counted as FUAS, and any additional second is counted as FUAS until the Unavailable status is cleared.

Change Performance Parameter Thresholds

Table 9-1 lists the default performance parameter thresholds.

Table 9-1. Default Performance Parameter Thresholds

Parameter	Number/ 15 Minutes	Number/ Day
CV	18432	176947
FRER	18432	176947
CRC	18432	176947
UATC	3	9
CSS	1	4
OFS	4	4
ES	300	4320
SES	30	90
UAS	30	90
MER	255	4095
FEBE	18432	176947
FES	300	4320
FSES	30	90
FUAS	30	90

These default values can be changed by using the following command:

CHG::SETOP rr,{TYPE mn|ALL},NPCOP (set1,set2,set3)!

Where:

rr = Designates the parameter to be changed
(see the following table for valid values).

set1,set2,set3 = User-programmable threshold values for the parameter.

- To change the facility performance parameter threshold values on a specified NPC without disconnecting and reconnecting provisioned circuits, enter the following command:

CHG::NPC <NPC no.>,OPTS(rr/m[,rr/m][...])!

Where:

rr = Facility performance parameter number

m = Facility performance parameter threshold index (0 through 3)

- To the threshold values for facility performance parameters on all NPCs of a particular type, enter the following command:

CHG::TYPE mnxyz,OPTS(rr/<m>[,rr/<m>][...])!

Where:

mnxyz = NPC type

rr = Facility performance parameter number

m = Facility performance parameter threshold index (0 to 3)

- To change facility threshold values for one or more NPCs of a particular type or SLC® bank without disconnecting and reconnecting provisioned circuits, enter the following command:

**CHG::{NPC <NPC no.>|RT ffff|DL ffff|TYPE mnxyz,.lf 382
OPTS(rr/m[,rr/m,...])!
[ww]:rr/m[&rr/m...])!**

Where:

RT = Remote terminal

DL = Digital Carrier Line Unit (DCLU)

mnxyz = NPC type

rr = facility performance parameter number

m = facility performance parameter threshold index (0 through 3)

rr	Parameter
11	Daily CRC Block Errors
12	Daily Framing Errors
13	Daily Out-of-Frame Seconds
14	Daily Errored Seconds
15	Daily Severely Errored Seconds
16	Daily Controlled Slip Seconds
17	Daily Coding Violations
18	Daily Unavailable Seconds
19	Daily Unavailable Time Count
20	Daily Multiframe Errors
21	Daily Far-End Block Errors
22	Daily Far-End Errored Seconds
23	Daily Far-End Severely Errored Seconds
24	Daily Far-End Unavailable Seconds
31	Degraded Minutes, 1 hour
32	Degraded Minutes, 24 hours
33	Severely Errored Seconds, 15 minutes
34	Severely Errored Seconds, 24 hours
35	Errored Seconds, 15 minutes
36	Errored Seconds, 24 hours
37	Unavailable Seconds, 15 minutes
38	Unavailable Seconds, 24 hours
39	Slips, 15 minutes
40	Slips, 24 hours
81	15-minute CRC Block Errors
82	15-minute Framing Errors
83	15-minute Out-of-Frame Seconds
84	15-minute Errored Seconds
85	15-minute Severely Errored Seconds
86	15-minute Controlled Slip Seconds
87	15-minute Coding Violations
88	15-minute Unavailable Seconds
89	15-minute Unavailable Time Count
90	15-minute Multiframe Errors
91	15-minute Far-End Block Errors
92	15-minute Far-End Errored Seconds
93	15-minute Far-End Severely Errored Seconds
94	15-minute Far-End Unavailable Seconds

 NOTE:

Values 31 through 40 are for PB/PC type NPCs and values 11 through 24 and 81 through 94 are for PA type NPCs.

Scheduling a Performance Monitoring Report

1. To schedule a performance monitoring report, issue the following command:

```
UTL::SCHED,PMREPT,NPC <npc No.1>[-<range>],RI rrrrr,\
ST ssss,NI nn,<parameter>,LV llllllllll,LOCN locn,\
AI aaaaa,TOF ttttt[-ooooo][,LK] p[vv][q[vv]]!
```

Where:

<npc No.1> = The 3- or 4-digit nonhierarchical starting NPC number.

<range> = The 3- or 4-digit nonhierarchical ending NPC number.

rrrrr = The interval between performance monitoring reports.
The following table lists valid intervals.

rrrrr	Explanation
{0001-1440}M	Report interval in minutes
{0001-0024}H	Report interval in hours
{0001-0007}D	Report interval in days

ssss = The starting time for the performance monitoring reporting schedule. {00-23}{00-59} is the Hour of day/Minute of Hour Format, while CURT is the value for the current time of day.

nn = The number of intervals over which performance monitoring is reported.

<parameter> = The parameter for which reporting is being scheduled.
The following table lists valid parameters.

Parameter	Explanation
CRC	CRC Block Errors
FRER	Framing Errors
OFS	Out-of-Frame Seconds
ES	Errored Seconds
SES	Severely Errored Seconds
CSS	Controlled Slip Seconds
CV	Coding Violations
UAS	Unavailable Seconds
UATC	Unavailable Time Count
MER	Multiframe Errors
FEBE	Far-End Block Errors
FES	Far-End Errored Seconds
FSES	Far-End Severely Errored Seconds
FUAS	Far-end Unavailable Seconds
ALLPM	All parameters listed above
ALLE	All near-end parameters listed above
ALLF	All far-end parameters listed above

LV = Level

llllllllll = The discriminating level for the requested parameter. This parameter is used to restrict report output to include only values that are above/below a defined level. The following table illustrates examples.

llllllllll	Explanation
{000000000-134217728}U	Discriminating Level-Up Direction
{000000000-134217728}D	Discriminating Level-Down Direction

Up = Parameters with values equal to or greater than the specified level.

Down = Parameters with values equal to or less than the specified level.

locn = The location being performance monitored. Either NEND for Near-end or FEND for Far-end.

aaaaa = The accumulation time period for the specified parameter. The following table shows examples.

aaaaa	Explanation
15MIN	15 minute accumulator
DAILY	Daily accumulator

tttt = The age of the requested data registers at the reporting time.

ooooo = This parameter may be entered as a range to specify up to four historical data registers. The following scenario shows a valid example.

If:

start time = 1205

report interval = 0001H

Number of intervals = 03

accumulation interval = 15MIN

Then:

time offset = 00015-00060

Checking Performance Monitoring Data

Overview: This procedure describes the command to check primary block performance monitoring data for PA type NPCs.

1. To check performance monitoring data, enter the following command:

⇒ NOTE:

When the ALL option is used with this command, only the data of one performance parameter may be queried.

```
UTL::QRY,{NPC <npc No.1>[-<range>] | ALL},\
<parameter>,AI aaaaa[,LV llllllllll][,LOCN locn]\
[,MONDAT dddd][,MONTIM tttt]!
```

Where:

<npc No.1> = The 3- or 4-digit nonhierarchical starting NPC number.

<range> = Optional, the 3- or 4-digit nonhierarchical ending NPC number

ALL = Used to request parameter counts for all NPCs of type PA.

If this option is selected, only one performance parameter may be queried.

<parameter> = The performance parameter requested. One of:

CRC	CRC Block Errors
FRER	Framing Errors
OFS	Out-of-Frame Seconds
ES	Errored Seconds
SES	Severely Errored Seconds
CSS	Controlled Slip Seconds
CV	Coding Violations
UAS	Unavailable Seconds
UATC	Unavailable Time Count
MER	Multiframe Errors
FEBE	Far-End Block Errors
FES	Far-End Errored Seconds
FSES	Far-End Severely Errored Seconds
FUAS	Far-End Unavailable Seconds
ALLPM	All parameters listed
ALLE	All near-end parameters
ALLF	All far-end parameters

⇒ NOTE:

If the value ALLPM, ALLE, or ALLF is selected, a single NPC must be specified, the MONTIM and MONDAT parameters may not have a value of ALL, and the LV option cannot be used.

aaaaa = The accumulation time period for the specified parameter: either 15MIN for parameter count from a 15-minute accumulator, or DAILY for parameter count from a daily accumulator.

llllllllll = Optional, the discriminating level for the requested parameter: 0000000000 - 345600000 followed by "U" (parameters with values equal to or greater than the discriminating level are reported) or "D" (parameters with values equal to or less than the discriminating value are reported).

If not specified, default is 1U. Cannot be specified when the ALL option is selected; then the default is 0U.

locn = The location being performance monitored: FEND for far-end or NEND for near-end (default).

dddd = The requested 24-hour performance monitoring period: HIST for the previous 24-hour accumulators, CURD for the current 24-hour accumulators (default), or ALL for all current and previous daily accumulators.

⇒ NOTE:

If the value ALL is selected, only one NPC can be specified in the command, aaaaa must equal DAILY, MONTIM cannot be selected, and ALLPM, ALLE, or ALLF cannot be selected for <parameter>.

tttt = The requested 15-minute performance monitoring period: HIST for the previous 15-minute accumulators, CURT for the current 15-minute accumulators (default), or ALL for all current and previous 15-minute accumulators.

⇒ NOTE:

If the value ALL is selected, only one NPC can be specified in the command, aaaaa must equal 15MIN, and ALLPM, ALLE, or ALLF cannot be selected for <parameter>.

2. The output of this command is handled as follows:
 - If a single NPC is specified, the data requested is output for that NPC.
 - If a range of NPCs is specified, the NPCs within the range that do not support the requested <parameter> will be skipped.
 - If the ALL option is requested, the data for all NPCs that support the requested <parameter> is output and NPCs that do not support the requested <parameter> are skipped.
3. If the command is denied, find the reason for denial and perform corrective action to obtain completion (*Command Denials* has explanations of denial codes).

Clearing Performance Monitoring Counts

Overview: This procedure describes the command to clear facility performance monitoring parameters for PA type NPCs

Only counts that exceed current threshold levels cause threshold-crossing messages or alarms.

Intervals before the previous interval may be queried using the ALL keyword, however, they cannot be cleared by manual command. Counts are cleared automatically as intervals pass, providing new errors are not counted.

1. To clear performance monitoring parameters, enter the following command:



NOTE:

When the ALL option is used with this command, only a single facility parameter may be cleared.

```
UTL::CLR,{NPC <npc No.1>[-<range>] | ALL},\
<parameter>[,AI aaaaa][,LOCN locn]\
[,MONDAT dddd][,MONTIM tttt]!
```

Where:

<npc No.1> = The 3- or 4-digit nonhierarchical starting NPC number.

<range> = Optional, the 3- or 4-digit nonhierarchical ending NPC number

ALL = Used to clear a single parameter for all NPCs of type PA.

If this option is selected, only one facility parameter may be cleared.

<parameter> = The monitored parameter accumulation register to be reset. One of:

CRC	CRC Block Errors
FRER	Framing Errors
OFS	Out-of-Frame Seconds
ES	Errored Seconds
SES	Severely Errored Seconds
CSS	Controlled Slip Seconds
CV	Coding Violations
UAS	Unavailable Seconds
UATC	Unavailable Time Count
MER	Multiframe Errors

FEBE Far-End Block Errors

FES	Far-End Errored Seconds
FSES	Far-End Severely Errored Seconds
FUAS	Far-End Unavailable Seconds
ALLPM	All parameters listed
ALLE	All near-end parameters
ALLF	All far-end parameters

⇒ NOTE:

If the value ALLPM, ALLE, or ALLF is selected, a single NPC must be specified and the MONTIM and MONDAT parameters may not have a value of ALL.

- aaaaa = The accumulation time period for the specified parameter: either 15MIN to clear a 15-minute accumulator, DAILY to clear a daily accumulator, or ALLAI to clear both daily and 15-minute accumulators.
- locn = The facility location corresponding to the set of performance monitor registers to be reset: FEND for far-end, NEND for near-end (default), or ALL for both far-end and near-end.
- dddd = The 24-hour performance monitoring period to be reset: HIST for the previous 24-hour period or CURD for the current 24-hour period. If aaaaa = DAILY and this option is not specified, all current and previous daily counts will be reset. This option cannot be specified if aaaaa = 15MIN or ALLAI.
- tttt = The requested 15-minute performance monitoring period to reset: HIST for the previous 15-minute period or CURT for the current 15-minute period. If aaaaa = 15MIN and this option is not specified, all current and previous 15-minute counts will be reset. This option cannot be specified if aaaaa = DAILY or ALLAI.

2. The output of this command is handled as follows:
 - If a single NPC is specified, the count for the requested parameter for that NPC is cleared.
 - If a range of NPCs is specified, the NPCs within the range that do not support the requested <parameter> will be skipped.
 - If the ALL option is requested, the counts for all NPCs that support the requested <parameter> are cleared and NPCs that do not support the requested <parameter> are skipped.
3. If the command is denied, find the reason for denial and perform corrective action to obtain completion (*Command Denials* has explanations of denial codes).

Check and Operate 2.048-Mb/s Line Loopback

Overview: This procedure contains the commands to check the loopback status of NPC and to change/operate the loopback. This loopback is of the entire framed signal (256 bits). The loopback is toward the line side and can be used to check transmission and alarms at the far end. The diagnostic NPC command at DACS II is used to verify the operation of the DPC (dual primary card) at the DACS II.

1. If you want to check the current loopback status, continue with Step 2.

- If you want to operate (or change) the line loopback, proceed to Step 4.

2. Enter the command to check the loopback status as follows:

UTL:[FRM xy,SEQ ww]:QRY,LPBK,NPC <npc No.>[-<range>]!

Where:

xy = Optional, DACS II frame number.

ww = Optional, command sequence number.

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

- If UTL ...DNY message is received, find the meanings of the condition codes in *Command Denials*.

3. Read the loopback state of the NPC from the output message and note the following about accompanying message keywords. An AIS means all 1s signal is sent downstream, and an fpa-off means that the NPC monitoring (facility performance alarms) of facility errors is disabled.

4. To change the loopback state, enter

```
CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],LPBK t!  
CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],LPBK [d]t!
```

Where:

d = Loopback direction specifier. Required for PA type NPCs when initiating or stopping loopback. Optional if changing value of performance monitoring specifier (**t**). Not allowed for PB/PC type NPCs. One of the following:

- E** Equipment Loopback. Loops the outgoing 2.048 Mb/s signal back to the DACS II equipment.
- F** Facility Loopback. Loops the incoming 2.048 Mb/s bipolar signal back to the facility.
- N** Stop Loopback.

t = Loopback signal transmission performance monitoring specifier. One of the following:

- A** Initiate loopback and send AIS (all 1s) downstream, reset all facility alarms/error counts, and disable facility performance monitoring.
- B** For PA type NPCs only. Initiate loopback, send AIS (all 1s) downstream/upstream and perform performance monitoring and alarm processing as usual.
- C** For PA type NPCs only. Initiate loopback with transparent pass-through of the received signal, turn off performance monitoring, and freeze the alarm and parameter counts for the NPC.
- T** Initiate loopback with transparent pass-through of the received signal.
- N** Terminate loopback.

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

- If CHG ...COMPL message is received, find the meanings of the condition codes in *Command Denials*.

5. Check the output message to verify the loopback state.

Change E1 NPC Default Threshold Crossing Alarm Mode

Overview: This procedure sets the system-wide default threshold crossing alarm mode for all PA-type E1 NPCs. The default setting can be programmed to either allow or inhibit performance monitoring threshold crossing messages for PA-type E1 NPCs. If this procedure is not used, the default setting allows E1 NPCs to generate threshold crossing alert messages.

Use of this procedure does not affect PA-type E1 NPCs that are already provisioned; it only changes the default setting that will be used in future E1 NPC provisioning commands. To inhibit or allow threshold crossing messages for PA-type NPCs that are already provisioned, use input commands I.38221 and I.38231.

If this command is used to set the mode to the state that already exists, it will complete successfully.

Enter the following command line:

CHG: :TYPE mn, THMODE hhh!

Where:

TYPE = Type of NPC

mn = NPC-type identifier where **mm** = **PA** for E1 NPCs.

THMODE = Thresholding mode

hhh = Thresholding mode option, set to one of the following:

hhh	Explanation
INH	Inhibit thresholding
ALW	Allow thresholding

The **INH** option inhibits thresholding and threshold crossing alert messages for all parameters of the PA-type NPCs that will be provisioned in the future. The **ALW** option undoes the effect of the **INH** setting and causes all future PA-type NPCs provisioned on the system to perform parameter thresholding and generate

threshold crossing messages when parameter counts meet or exceed their thresholds. The default thresholding mode is **ALW**.

Even if the **INH** mode is selected and thresholding is inhibited, threshold values are stored in the database and will be output when manually queried. Threshold value option changes are also still permitted if NPC thresholding is inhibited.

Facility Loopback for TE or TH Type NPC within a Hybrid DS3

For TE or TH type NPCs that are associated with a Hybrid DS3 signal, DACS II executes a near-end (at the DACS II) line loopback by transmitting the received information bits of each frame back onto the embedded DS1 facility.

Activate a Facility Loopback for TE or TH Type NPC within a Hybrid DS3

1. To activate a facility loopback, input the following command:

OPR::LPBK loop[t],NPC <npc No.1>,LOCN locn!

Where:

<npc No.1> = NPC number.

loop = Loopback type. Only LINE is allowed for TE or TH type NPCs associated with a Hybrid DS3 signal.

t = (Optional) Loopback signal transmission specifier.
If used, t=N, which prevents the DACS II frame from sending AIS downstream. Otherwise, for TE and TH type NPCs on a HDS3U, AIS is sent downstream as the default.

locn = Loopback location. Only NEND is allowed for TE or TH type NPCs associated with a Hybrid DS3 signal.

**Deactivate a Facility Loopback for TE or TH type
NPC within a Hybrid DS3**

1. To deactivate a facility loopback, input the following command:

RLS::LPBK loop,LOCN locn,NPC <npc No.1>!

Where:

<npc No.1> = NPC number.

locn = Loopback location. Only NEND is allowed.

loop = Loopback type. Only LINE is allowed.

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Enter Cross-Connection to CPR Pack

Overview: This procedure contains the command to cross-connect signaling time slot 16 (telephone channel 31) from a facility NPC to a c-bit processor (CPR) pack in the DSPU. The DACS II software automatically assigns the next available CPR number and channel to the connection. The CPR pack will subsequently be provisioned to monitor and/or source c-bit patterns on the circuits (liaisons) on the facility NPC.

1. Enter the cross-connect command as follows:

TCON:[FRM xy,SEQ ww]:FROM <npc No.>,CB[,RDC][,{CUS|INCL}]!

Where:

xy = DACS II frame number (00 through ZZ)

ww = Command sequence number (00 through 49)

<npc No.> = NPC number, either extended (for example, [0]001)
or hierarchical (for example, 01101).

CUS|RDC = Optional, to mark the channel (or cross-connection)
as customer controlled or special service which
requires use of INCL keyword to disconnect the circuit.

INCL = Required to address same NPC in command again if
the NPC was marked with CUS keyword.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

⇒ NOTE:

If the CPR cross-connect capacity is exhausted, refer to the procedure to establish another CPR pack.

2. Check the output message to confirm that correct information was entered.
3. To familiarize yourself with the use of the MAP query output for the CPR pack, enter **UTL : :QRY, CMAP <npc No.>!** where the NPC number is for one of the CPR packs in the DSPU.

Enter C-Bit Processing Commands

Overview: This procedure contains the CHG commands to initiate and change the c-bit processing for the circuit (liaison). The c-bit processing involves monitoring the c-bits for changed states and inserting c-bit patterns that dictate conditions (for example, signal looping) for the circuit. An NPC can be set to monitor and/or insert c-bit patterns, and NPCs in different frames can be used for each direction of the liaison. The processing is done on circuits which are electrically cross-connected to the CPR pack in the DACS II. Frames are chosen as director DACS II frames because of their location in the circuit. The three commands in this procedure can be used independently and have the following functions: one (with DD keyword) selects the read or write capability for the director DACS II, another (with BC field) selects the required c-bit pattern to be inserted, and the other one (BCOFF) discontinues the c-bit insertion.

1. Which director DACS II activity do you want to perform?
 - If **INITIATE OR CHANGE READ/WRITE CAPABILITY**, continue with Step 2.
 - If **ENTER C-BIT PATTERN TO BE INSERTED**, proceed to Step 4.
 - If **DISCONTINUE C-BIT INSERTION**, proceed to Step 6.

2. Enter the following command to specify the director DACS II function for the circuit or range of circuits connected to the CPR pack:

CHG:[FRM xy,SEQ ww]:DD(m,w),TO <npc No.>ddd[-eee]!

Where:

- xy = DACS II frame number (00 through ZZ)
 - ww = Command sequence number (00 through 49)
 - <npc No.> = NPC number of facility termination on the director DACS II, either extended (for example, [0]001) or hierarchical (for example, 01101).
 - ddd = Channel number (01 through 30) on same NPC for subject circuit.
 - eee = Optional, to name last channel of range of circuits associated with same CAS signal; up to 30 channels.
 - m,w = Specifies monitoring (m) and/or writing (w) the c-bit pattern at the CPR pack. Enter one of the following for each: 1 to enable, 0 to disable, and a dash (-) for no change from existing. However, both (m) and (w) cannot be set to a dash (-) at the same time.
- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. Check the output message to confirm that correct information was entered.
4. Enter the required c-bit pattern for the circuit(s) using the hexadecimal notation in the command as follows:

**CHG:[FRM xy,SEQ ww]:BC X'abcd,TO <npc No.>ddd[-
eee][,INCL][,RDC]!**

Where:

- xy = DACS II frame number (00 through ZZ)
 - ww = Command sequence number (00 through 49)
 - <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).
 - ddd = Channel number (01 through 30) on same NPC for subject circuit.
 - eee = Optional, to name last channel of range of circuits.
 - abcd = Hexadecimal notation for the 14-bit pattern to be sent on the addressed c-bits. Except for digit-a which only specifies 2 bits, each Hex digit represents 4-bits of the pattern per Figure 10-1.
 - INCL = Required to change pattern that was previously entered with the RDC designation added to indicate special circuit.
 - RDC = Optional, to designate a special service circuit.
- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

5. Check the output message to confirm that correct information was entered.

Hexadecimal word (X-abcd):
 Digit a = bits 0,1,2,3 of C-bit pattern
 (Note: Bits 0 and 1 cannot be set;
 thus, valid values are a=0,1,2, or 3)
 Digit b = bits 4,5,6,7
 Digit c = bits 8,9,10,11
 Digit d = bits 12,13,14,15

Figure 10-1. Construction of Hexadecimal Word

6. Enter the following command to discontinue inserting prescribed c-bit pattern on circuit(s):

CHG:[FRM xy,SEQ ww]:BCOFF,T0 <npc No.>ddd[-eee][,INCL]!

Where:

- xy = DACS II frame number (00 through ZZ)
 - ww = Command sequence number (00 through 49)
 - <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).
 - ddd = Channel number (01 through 30) on same NPC for subject circuit.
 - eee = Optional, to name last channel of range of circuits.
- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

7. Check the output message to confirm that correct information was entered.

Enter C-Bit Query Commands

1. Which information are you looking for?
 - If **DIRECTOR FUNCTIONS OF C-BIT(S) FOR CHANNEL/CHANNEL RANGE**, continue with Step 2.
 - If **DIRECTOR FUNCTIONS ON NPC/NPC RANGE**, proceed to Step 4.
 - If **C-BIT STATE AND PATTERN FOR CHANNEL**, proceed to Step 6.
 - If **C-BIT STATE AND PATTERN FOR NPC/NPC RANGE**, proceed to Step 8.

2. Enter the following command for the desired channel or range of continuous channels:

UTL:[FRM xy,SEQ ww]:QRY,DD <npc No.>ddd[-eee]!

Where:

xy = Optional, DACS II frame number (00 through ZZ).

ww = Optional, command sequence number (00 through 49).

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number of circuit (liaison); 01 through 30.

eee = Optional, last channel of range of channels on same NPC; maximum range 30.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

3. Check the output message to confirm that correct information was entered; proceed to Step 10.
4. Enter the following command for the desired NPC or range of NPCs:

UTL:[FRM xy,SEQ ww]:QRY,DD,NPC <npc No.>[-<range>]!

or to see all transmit Director DACS II c-bits enter

UTL:[FRM xy,SEQ ww]:QRY,DDCT,ALL!

⇒ NOTE:

The command with DDCT includes c-bit patterns. This command may take up to 30 minutes to complete for a full 3-bay frame.

Where:

xy = Optional, DACS II frame number (00 through ZZ).

ww = Optional, command sequence number (00 through 49).

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC number of range of NPCs.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

5. Check the output message to confirm that correct information was entered; proceed to Step 10.
6. Enter the following command for the desired circuit (liaison):

UTL:[FRM xy,SEQ ww]:QRY,BC s,T0 <npc No.>-ddd!

Where:

xy = Optional, DACS II frame number (00 through ZZ).

ww = Optional, command sequence number (00 through 49).

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number of circuit (liaison); 01 through 30.

s = Selects c-bit information (state and pattern) for either c-bits received by CPR (s = R) or transmitted from CPR (s = T).

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

7. Check the output message to confirm that correct information was entered; proceed to Step 10.

8. Enter the following command for the desired NPC or range of NPCs:

UTL:[FRM xy,SEQ ww]:QRY,BC s,NPC <npc No.>[-<range>]!

or to see all c-bit patterns enter:

UTL:[FRM xy,SEQ ww]:QRY,BC s,ALL!

Where:

xy = Optional, DACS II frame number (00 through ZZ).

ww = Optional, command sequence number (00 through 49).

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC number of range of NPCs.

s = Selects c-bit information (state and pattern) for either c-bits received by CPR (s = R or D) or transmitted from CPR (s = T). Option D gives a condensed format; ALL command can only be used with s = D.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

9. Check the output message to confirm that correct information was entered.

10. Read the information from the output message using the following guidelines:

- For the "Provisioning of C-BIT as DD" output for the UTL QRY ...DD query, "0" means not selected and "1" means selected. The output for each channel is in the form -mw for monitor, write; this format is repeated for all channels on NPC or range of NPCs as requested.
- For the "STATUS OF C-BIT" output for the UTL QRY ...BC query, the status of the c-bits for each channel is given as one of the following: Z0 for all zeros (idle), NA for network alarm, UP for not provisioned, or UN for undetermined, or framed.
- If the status of the c-bit is framed and the director DACS II function for the c-bit is to write, the c-bit pattern inserted by the CPR will be given for the channel or range of channels. The construction of the hexadecimal word giving the insertion pattern for each channel is given in Figure 10-2.

Hexadecimal word (X-abcd):
Digit a = bits 0,1,2,3 of C-bit pattern
(Note: Bits 0 and 1 cannot be set;
thus, valid values are a=0,1,2, or 3)
Digit b = bits 4,5,6,7
Digit c = bits 8,9,10,11
Digit d = bits 12,13,14,15

Figure 10-2. Construction of Hexadecimal Word

Enter Command to Disconnect from CPR Pack

Overview: This procedure contains the command to disconnect signaling time slot 16 (telephone channel 31) connection from a facility NPC to a c-bit processor (CPR) pack in the DSPU. The DACS II software automatically finds the CPR number and channel of the connection. The disconnection would be required if the circuits were changed and the director DACS II functions were no longer needed for the same NPCs or if the NPCs were going to be degrown from the data base.

⇒ NOTE:

All director DACS II functions must be disabled (DD=0,0) and c-bit insertion must be turned off (BCOFF) before the circuit can be disconnected.

1. Enter the disconnect command as follows:

TDIS: [FRM xy, SEQ ww]:FROM <npc No.>, CB[, INCL][, OOS]!

Where:

<npc No.> = NPC number of facility termination; either extended (for example, [0]001) or hierarchical (for example, 01101).

INCL = Required to disconnect from CPR if connection was made with the special service designation (RDC) or (CUS).

OOS = Required to disconnect the facility NPC from the CPR if the facility NPC is out-of-service. The OOS word is not needed if the CPR is out-of-service.

- If the command is denied, find the reason for the denial and perform corrective action to obtain command completion (*Command Denials* has explanations of denial codes).

2. Check the output message to confirm that correct information was entered.



Command Denials

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Contents

Clear Command Denials

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Command Denials

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Clear Command Denials

1. If you have one of the following word strings in the denial message, read the associated information and perform corrective action to obtain command completion.
 - **INACT** - The INACT message indicates that the command is invalid with the feature package being used.
 - **BAD SYNTAX** - Determine the portion of the command that was in error from the designator (BAD VERB/FRM ERR/SEQ ERR) in the message and reenter the command with the correct information. If you do not understand how to correctly construct the command, you can get on-screen help using the help routine (initiated by entering a question mark, ?).
- ⇒ **NOTE:**
The DACS II indicates where the input error occurred, by placing = signs around the word or portion in the echoed command.
- **ERR, ABT** - Reenter the command; a transient frame condition may have caused the command to be aborted. If the command is aborted again, check the printout to find associated trouble messages.
 - **MC OOS** - The MC (main controller) must be restored to service to execute the command.

- **MCOND** - The MC is in the maintenance condition, and only commands which are considered frame maintenance commands can be used.
 - **MC INSERVICE** - The MC must be in the maintenance condition to execute certain PMEM and SMEM commands.
 - **MPDBASE** - The main processor data base is not loaded.
 - **RESTRICTED, STOPPED** - Only users who have been assigned the use of restricted maintenance commands can use the command. The use of this set of commands is enabled by the frame administrator who enters the ADD command with option RMON for the user.
2. If you received a COND cc DNY message, find the meaning of the COND code in Table 11-1.

**NOTE:**

Since only the last 2 digits of the condition code appear in the message, some of the codes have multiple meanings. If any meaning in Table 11-1 is not appropriate for the command that was denied, check the other meanings.

3. Command denials can be categorized under common causes. Check the following descriptions and, if applicable, perform corrective action to obtain command completion.
- **Input Error** - Check each field of the command entry on the screen or printout against the documented command to find the error.
 - **Not Equipped, Not In-Service, or Failed** - The named equipment is not grown (equipped) or in-service to support the execution of the command. The commands to grow and restore the plug-in to service are covered in provisioning in Volume 1, and procedures to clear failed plug-in and trouble messages are in this trouble-clearing volume.
 - **Incorrect NPC/Channel Number** - Check each side of the cross-connect command to find incorrect numbers that are already assigned or assigned differently. There are query commands in the cross-connect procedures to obtain information about existing connections on the frame.

- **Invalid Parameters** - Check each field of the command entry against the documented command to determine which keyword is incorrectly used.
- **Boot Failed** - This is a specific restore command denial. Reenter the restore plug-in command and subsequent diagnose command in an effort to get a DGN ...STF message for which there is trouble clearing in the respective trouble-clearing chapter. If no DGN ...STF message is obtained but the denial persists, replace the plug-in to be restored.

Table 11-1. Frame Denials

cc	<i>Explanation</i>
00	No conditions
01	Assignment of single priority to multiple SSPs Backup required before executing this command Invalid range for specified NPC type No FADs were activated by link n No test ports were activated by link n Subject entity is equipped
02	Invalid NPC type for AIS insertion Manual Pending is Active One or more FADs could not be released One or more test ports could not be released Subject entity is not equipped
03	DS3U NPC already In-Service No RDC or CUS circuits and INCL keyword used Subject entity is in service This NPC type does not allow unframed Clear-DS1
04	MONDAT keyword is invalid for this feature No NPC's out of service and OOS keyword used Subject entity is out of service This NPC type does not allow Payload
05	Invalid parameter combination Invalid use of CONV keyword Subject entity is pested This NPC type does not allow unframed Clear-DS1
06	Device failed to format Invalid range for specified FROM NPC type Mismatch between MXR and MIU HDW types
07	Device failed to initialize Invalid range for specified TO NPC type Mismatch between MXR and NPC types
08	Cannot remove own link Invalid FROM NPC type for AIS insertion Mismatch between service MXR and protection MXR types
09	Invalid TO NPC type for AIS insertion Last link in service Wrong MXR type grown for this MIU
0A	All CBTYPE NPCs out of service or failed DGN on subject entity failed Minor Slip threshold disabled before Major Slip threshold
0B	Another signal already active prevents this signal from being sent BOOT on subject entity failed Invalid CEPT NPC
0C	DGN on subject entity denied PM scheduling report is already inhibited for this entity The MONDAT and MONTIM parameters can not both be specified

cc *Explanation*

- 0D** PM scheduling report is already allowed for this entity
Unpestering error registers for subj. entity failed
- 0E** No equalization for CEPT FTMI
Only one parameter is allowed
The specified parameter is not applicable to operation mode of the RT
- 0F** Frame time is not set
Side specified for non-duplicated NPC
- 10** NPC out of service or failed
RT's alarm exists
Unit is not equipped
- 11** NPC not equipped
PMEM type no longer supported
UC is out of service
- 12** Active CCN side not IS or failed or pestered or hardware OOS
First and Last NPCs are outside unit boundary
UC is in service but failed
- 13** FTMI is not equipped
First and Last NPCs are outside a module boundary
UNIT not equipped, not in service, or failed
- 14** 1 hr $\geq$ 24 hr for DM opt
CCB not eqd, not IS, or failed or inactive side CCB not eqd or not IS
FTMI is out of service
OFFSET range is invalid
- 15** 15 min $\geq$ 24 hr for SERS opt
FTMI not equipped, not in service, or failed
NPC is unequipped
- 16** 15 min $\geq$ 24 hr for ERS opt
FC not eqd, not IS, or failed or inactive side FC not eqd or not IS
FC not eqd, not IS, or failed or inactive side FC not eqd or not IS
Only up to 4 historical data registers are allowed
SYNC TB is not equipped
- 17** 15 min $\geq$ 24 hr for US opt
Command did not execute for any entity specified in the command
SYNC is out of service
TSI not eqd, not IS, or failed or inactive side TSI not eqd or not IS
- 18** 15 min $\geq$ 24 hr for SLIP opt
CCNI is out of service
DSPI not equipped, not in service, or failed
DSPI not in service or failed
Exceeded limit of reports with accum. interval of 15 min. or less
- 19** Exceeded maximum limit of PM reports
Mate CCN side is out of service
Test ports must be on CAS
- 1A** Mate SYNC is out of service
Report already exists
Required FLI not equipped, not in service, or failed
The facility parameter not programmable for specified x or z parameter

cc *Explanation*

- 1B** CCN side s is in service
Historical data can not be specified
Required MXR not equipped, not in service, or failed
Two digroups from same bank added to different FTMI's
- 1C** CCN side s is out of service
Reqd FMT not eqd, not IS, or failed, or inact side FMT not eqd, or not IS
- 1D** Level field is not allowed
Required MIU not equipped, not in service, or failed
- 1E** Customer control or red circuit exists
Monitored Date field is not allowed
Monitored Date field is not allowed
- 1F** FTMI is in service but failed
Scheduled reporting for this npc is inhibited
- 20** Line format types are incompatible
Only DAILY for accumulation interval is allowed
Only DAILY for accumulation interval is allowed
Option rr/m has not been set up on 2nd database
Software Identification Block is not readable
- 21** Minor >= major for SLIP opt
Only 15MIN for accumulation interval is allowed
Only 15MIN for accumulation interval is allowed
Software Identification Block failed comparison
Trunk conditioning is invalid
- 22** FMC cannot be cross-connected in this format
FTMI is PESTED
Minor <= major for BER opt
Release number mismatch
- 23** Minor >= major for COFA opt
No PM data available
No PM data available
Point number mismatch
- 24** Monitored Time field is not allowed
Monitored Time field is not allowed
PDI Version number mismatch
Unit type error
- 25** Accumulation Interval field is missing
FTMI type error
Invalid FPI value
- 26** Feature deactivation would leave system with core software
NPC type error
- 27** Disable not allowed - supports another feature
Illegal connectivity specified
Only historical data can be specified
- 28** Connectivity contains unequipped units
Feature is active
Scheduling report could not be found
- 29** Feature not enabled

cc *Explanation*

IW is UMUX (18) but NPC not type DE4yz
This signal is already being sent

2A DMI combined with T1DM

Database not loaded
Deny Clear-2MB for Alternate Maps
Incorrect pack type in slot

2B Bit c not settable

Database corrupt
Maj|Min BER threshold is 7, but not in T1DM or Fe mode
Reading Feature Package Id from PMEM failed

2C Write to CPR failed

Writing Feature Package Id to PMEM failed
not allowed for clear 2MB

2D RTF keyword is used without DGA

TS0 is crossconnected to TS0

2E RTF keyword and the operation mode does not match

bit value not allowed for NPC type

2F Channels assigned, cannot be grown as test port

TS0 connected to nonTS0 in Mode 2 - "a" should be "-" or equal to "b"
The RT id entered is not a retrofit one

30 NPC not provisioned for CAS

No signals active
Termination is already assigned
Unit is not FTU type

31 Accumulation Interval field is not allowed

Failed to switch SYNC side
NPC not provisioned for NSA

32 Bit 3 provisioned for use as RA13

Termination is under test
Threshold value is out of range

33 Bit 4 provisioned for use as RA1S

NPC not DA or TA type.
Termination is a test port
Wrong TLI type

34 NPC type option xyz is unassigned

NPC type option xyz is unassigned or invalid for feature package
Termination is under customer control (CUS)

35 Invalid use of INCL keyword

NPC has active circuit
Termination is protected (RDC)
The mate FLI is OOS and Protection MIU is equipped

36 DSPI not equipped

INCL keyword needed when restricted Insertion Word specified
TD on one(both) sync(s) is not equipped or not in-service
Termination is not connected as indicated

The mate FLI is OOS and Protection MXR is IS

37 DSPI out-of-service

cc *Explanation*

- Major/Minor BER threshold value is invalid for SLC NPCs
- Selected FLI has LOC with at least one inservice MXR
- The mate FLI is OOS and at least one Service MXR is equipped
- Two confs. were prev. connected or the concat. cause BRD-BBL loop
- 38** Deny SP Type NPCs for Alternate Maps
- FC not equipped
- The selected FLI is IS and Pested and at least 1 Service MXR is eqd
- Unselected FLI has LOS with at least one inservice MXR
- 39** An autonomous switch is in progress
- MXR LOS with unselected FLI
- Not enough TSIs for CCB test
- Signaling state of the trunk failed for the channel
- 3A** Bit 4 provisioned for use as RBER
- Invalid FPI value
- Invalid poll time
- No unmapped slots on a bus
- 3B** Bit 5 provisioned for use as SFI
- Not valid for frame administrator
- Unspecified L2 address
- 3C** Bits 3 through 8 are provisioned for Transmic 1G
- Duplicate L2 address
- TS0 specified with width not 1
- 3D** Alarm bits cannot be passed through or inverted
- Illegal test access mode for TS0
- No mapped slots on a tsi
- 3E** DSPI failed
- Mapped slots exist on a tsi
- TS16 specified for test with width not 1
- 3F** Conference exists in a DMB
- G4 to G4.1 retrofit failed
- Illegal test access mode for TS16
- 40** CCN denied request
- FC out of service
- Not enough DSPPs are equipped
- Only one channel allowed to have this language
- Signaling processing is not activated for the channel
- The service FLI is out of service or pested (TOSRVC option)
- 41** Failed to boot subject CCN side
- Language "F" provisioned for this channel
- Not enough DSPPs are in service
- The protection FLI is out of service or pested (TOPRTN option)
- 42** Change not valid
- DSPP not in service, or failed
- RST failed to boot program
- The service FLI is already selected (TOSRVC option)
- 43** (NPC) Hardware mismatch
- RST failed to boot DB

cc *Explanation*

- The protection FLI is already selected (TOPRTN option)
Trying to change in NTR direction
- 44** Invalid direction specified for NTST TLA/TLR
NPC not IU/TI type
Service MXR is not equipped
- 45** A DMB on the UNIT is OOS
IU/TI type NPC failed
NPC not provisioned as DGA
Service MXR is out of service
- 46** Failed to boot CONF file
NPC Failed or Out of Service
Service MIU is out of service
virtual SLC NPC not provisioned
- 47** Failed to boot DB
IU/TI type NPC
Invalid channel number
Protection MXR is out of service
- 48** Bad PRIM X'efgh values
Failed to boot journal--recurrence indicates database corruption
Invalid SLC Mode-III channel number
Protection MIU is not equipped
- 49** FAC keyword is invalid for this feature
Failed to boot unit
Protection MIU is out of service
test group unequipped
- 4A** PRIM keyword is invalid for this feature
Red circuit, INCL not entered
SMEM error, boot from PMEM
The protection MMFG is serving another facility
channel part of a TP or TG
- 4B** Customer controlled circuit, INCL not entered
PMEM error, boot from SMEM
The Service MMFG is already under protection
The common bit(s) is(are) not set in both FAC & PRIM
channel already under test
- 4C** BCON BBL has one or more legs under test
Both FAC and PRIM values(keywords) are required
Failed to boot CI
The Service MMFG is not under protection
- 4D** DSPI is in service
Gateway test access not supported
MP database not consistent with Configuration file
The switch is allowed (not inhibited)
- 4E** IW option is not allowed for new type of Clear-DS1 NPC
RTBC conference exists
The switch is already inhibited
- 4F** BER must not be less than 4 for Clear DS1

cc *Explanation*

- NPC is not part of a one-way connection
inconsistent BCON width for test access
- 50** CPR in buffer overflow condition
Can't run test on active side
Invalid MIU/MXR type specified
Trunk conditioning doesn't match that of conference
invalid channel designation for BCON
- 51** C-bit modify function is disabled
CUS flag doesn't match that of conference
General boot failure (vanilla flavor)
TG width incompatible with circuit
The pair MXR is not equipped
- 52** CPR is not equipped
Database is empty
FDL selected with width not 1
RDC flag doesn't match that of conference
The MMFG is protected
- 53** CPR is out of service
Database is not empty
TO side of two-way to be converted is not an FTU NPC
The associated MMFG is under protection (for Service MIUs)
inconsistent HUB width for specified TG
- 54** Conversion leg is terminated
Cross-connect to CPR is required
The MIU is already equipped
invalid mode for TLA/TLR
- 55** Invalid CFT code
Some associated NPCs are equipped
Width of existing two way does not match conference width
circuit already terminated
- 56** FROM is a two-way and no CONV specified
The MXR is in service
Unrunnable CFT code
circuit not terminated
- 57** Designated TG or circuit to be tested in process of being rolled
FROM is not a backbone leg
SIDE must be specified for substrate NPC
- 58** DSPU is not equipped
NPC is OOS for a TGR command and OOS keyword not specified
SLC 96 MD 1 RT DGP requires mate NPC to be unequipped
Specified width does not match existing conference width
- 59** DSPU unit controller is out of service
Invalid TC specification
NTR invalid since existing conference is not already NTR
Number of DGPs on each unit is limited to 32
- 5A** DSPU unit controller is failed
LPD invalid since existing conference is not already LPD

cc *Explanation*

- NPC not in service or failed
- 5B** C-bit modify function is active
TO is not a leg of this/any conference
channel is OCON in opposite direction
- 5C** Can't disconnect return leg unless entire conference disconnected
Inconsistent or invalid circuit type for Nx64Kbit TA
NPC providing timing to inservice SSP
- 5D** Inconsistent Signaling on CEPT NPCTGs
Sync source NPC is not inservice
TO is the backbone leg of a conference
- 5E** Sync source NPC is not equipped
TO is a part of the same conference as a previous TO
invalid test access mode
- 5F** Conference is NTR: has no switchable return leg
input channel out of range (SLC not supported)
- 60** Conference is LPD: has no switchable return leg
Selectable AIS not valid for specified NPC(s) type
User macro/map space is full
circuit contains mapped channels for HUB request
- 61** All NPC(s) are either not valid or not grown
System macro/map space is full
TO is already the return leg
not all FROM channels on same NPC
- 62** File is being accessed
IU type NPC(s) cannot be provisioned for Minor Alarm
Invalid channel number
NPC type mismatch
None of the designated NPCTG(s) are equipped
- 63** File already exists
NPC is a DGP
NPC is a channelized NPC
None of the designated TG(s) are equipped
- 64** File doesn't exist/can't be accessed
Frame is not in MCOND
NPC is a non-channelized NPC
NPC is already grown and added as SLC digroup
TG width too large for single NPCTG
- 65** Another NPC is grown and added as this digroup
Command invalid while backup in progress
Ending channel is out of range
Link being used is not Link 1
- 66** DGP designated to bank without data link
Map/macro file write deferred until backup is completed
TG number previously assigned
User login-id is not DAX
- 67** DGA is not added
Improper roll command sequence

cc *Explanation*

- NPC(s) actual type incompatible with TYPE keyword and/or alarm type
 User logged off during session
- 68** Incorrect language/addressing mode
 NDL option is used without DGA
 NEW NPC already cross-connect or mapped channel(s) on new
- 69** Incorrect number of parameters
 Mapped parity channel(s) on new
 Use of this NPC is RESERVED for SLC 96 MD 1
- 6A** NPC type is not DS type
 New in CGA or PBA
 No macro is currently executing
- 6B** Invalid line number
 No mapped channel on old
 Operation mode and digroup name don't match
- 6C** File is empty
 Framing format, digroup name & operational mode don't match
 Old and new chan on same NPC and within the range
- 6D** Counting sequence and operational mode don't match
 One NPC is a non-channelized type and the other is not
- 6E** DGA with NDL option is not provisioned with D4 or ESF framing format
 No edit session active
 Old or new is a non-channelized type in a DS0 command
- 6F** Adding two digroups from one bank on same DDC
 The OLD or NEW NPC is already being rolled.
 The session is terminated due to maintenance operation
- 70** Digroups from same bank have different modes
 NPC invalid type
 One of the FAR end channels is being rolled
 Some circuits not activated,cleared or pictured
 Try to add a BBL to VC,but the VC already has backbone
- 71** Digroups from same bank have different counting sequence
 NPC is a Facility Access Digroup
 The reference map does not exist
 Try to delete a BBL leg from VC;however, VC has no BBL leg
 Unmapped channel(s) on old
- 72** Digroups from same bank are added to two different FTUs
 Invalid test mode for an unmapped test session
 One of the far NPC(s) is SLC
 The NPC of VC BBL leg doesn't match that in the input command
 The map is not valid
- 73** Both sides of CCN are OOS
 Channel has a FAR, which is within the range
 Invalid PWR/MISC alarm level
 Invalid test mode for a one-way test session
 The first channel of VC BBL leg doesn't match that in the input command
- 74** At least one UC is OOS or At least one UC is failed
 Old and new are the same NPC in a DS1 command

cc *Explanation*

- PWR/MISC alarm is specified to a digroup other than DGA
 Try to delete a BRD leg from VC; however, VC has no BRD leg
- 75** At least one UC is not the correct type
 Old and new channels have not been paired by a BCAST command.
 Test session already exists
 The input BRD leg is not in VC
- 76** AIS not entered for SPLTE/SPLTF/SPLTEF/LOOPE/LOOPF
 Alarm option and bank mode don't match
 Channel or NPC not bridged
 The first channel of VC BRD leg doesn't match that in the input command
- 77** Obsolete circuit type
 Tried to disconnect a nonexisting VC
 Unassigned operational mode
- 78** Protection switch process failed
 Ranges of old and new do not match
 Try to operate a ONE-WAY conference with a TWO-WAY input command
- 79** DCTN conference channel cannot be rolled
 DGA/DGP of RT/DL Mode I must be assigned to one DDC
 NPC is not a Facility Access Digroup
 Try to operate a TWO-WAY conference with an ONE-WAY input command
- 7A** Mode I RT/DL IDs don't match for DGA/DGP on same DDC
 NPC is not an E-end
 Testport/testgroup channel cannot be rolled
 The NPC to delete has not been previously added to map
- 7B** Channel out of bound in a BCON/v.c
 Invalid change from previous mode
 Other NPC on this DDC not the same digroup for Mode I DGA/DGP
- 7C** Different DSxyz types are used for DGA/DGP on same DDC for Mode I
 Logical conflicts found in the map
 NPC is not a F-end
 Parity channel out of bound on new
- 7D** Can't start new session - previous session still verifying
 Not first channel in a BCON/virtual conf
 The NDL options are different for DGA's on the same DDC for Mode I
- 7E** Bank id number not found
 Framed/Unframed clear 2Mbit/s NPC invalid for Automatic CRC-4
 Insufficient data for setting up a conference
- 7F** NPC is not added
 No OOS keyword is given for out-of-service NPC
 Unframed clear 2Mbit/s NPC invalid for TS0 processing
- 80** Database conference width does not match the range in input command
 Framed/Unframed clear 2Mbit/s NPC invalid for Transmic 1G, 2G
 Inconsistent channel range width
 NPC number and bank id don't match
 Some TSIs to degrow are in service
- 81** Conference Port is currently registered to a different channel
 Frame ID is protected

cc *Explanation*

- Framed/Unframed clear 2Mbit/s NPC invalid for Firmware Timing
 Invalid input BBL as fmd in ONE-WAY command
 NPC number and digroup name don't match
- 82** Can not use 12-th TP when NPCTP is in the T1DM or DMI mode
 DL ffff is used w/ operational mode other than Mode I
 Invalid input BRD as tmd in ONE-WAY command
 Unframed clear 2Mbit/s NPC invalid for Bit 4 used as RA IS/RBER
- 83** Attention: preceding ccode 83 is an anomaly - see problem list
 Conference Port is already registered to the same group of channels
 Invalid input BBL in terminated TWOWAY/ONEWAY command
 Language is not allowed
 NPC type is inconsistent with FTMI type
 Option not programmable for this NPC type
- 84** Channel(s) is already registered
 Incompatible types of NPCs in a DDC
 Mate NPC is not equipped
 NPC is non-channelized
 Problem occurred while accessing SMEM or unformatted SMEM
 Trying to add or delete a leg when a conference is under test
- 85** IW not allowed to be specified in Clear 2Mbit/s
 Input BRD (BBL) has same NPC and channel as BBL (BRD)
 NPC has been designated as NPCTP
 New bank id is an assigned one
 Problem occurred while accessing PMEM
 Using the 24th channel of a T1DM NPC
- 86** Attempt to remove DGA w/o INCL keyword or prior prot. sw. request
 NPC is NPCTG and chan 24 is used in a TG; Can't change to T1DM or DMI
 NPC number out of range
 Source does not contain requested information
 Using the 24th channel of a DMI NPC
- 87** Copy source NPC is not equipped
 DGP is protecting a primary digroup
 NPC as 12th test port can not change to DMI nor T1DM
 Old_tape is a special install tape
- 88** Conference port is not registered
 NPC is not a NPCTP
 Report interval is not an integral number of accumulation interval
 SMEM is a normal SMEM
- 89** Can't delete because not all associated NPCs of the RT are entered
 Conference port is currently connected
 Interval is not valid/not available
 Interval is not valid/not available
 NPC is not designated for this NPCTP/NPCTG
 Problem occurred while accessing BOTH_MEM
- 8A** Mismatch between channel 0 crossconnect and keywords
 NPCTP is not grown
 x & z parameters on DSxyz are inconsistent

cc *Explanation*

- 8B** Channels and conference port do not match
Digroup name and bank id don't match
PMEM not in service or not ready
Test port is not idle or frame is not inservice
- 8C** DB MP or units ram error
Digroup is protected
The two FADS entered are not associated with one another.
- 8D** Clear gateway test access disallowed.
DB PMEM error OP-CL-RD-WR-SK
RT/DL has unrestored DGA
- 8E** Attempt to add to a null transmitting port
DB can't send or receive mail
DGA protected; use INCL to remove, or unswitch protection
No mapped circuit under test; emode/fmode can't be changed.
- 8F** Can't lock or unlock ram database
NPC not deleted
Number of transmitting ports does not match existing conference
One-way circuit under test; emode can't be changed.
- 90** Can't mount or unmount BOTH_MEM
DB can't get the slave mail box
Invalid change parameter combinations
NDL option is specified for DGA
The total number of receiving ports specified exceeds the max.
emode/fmode can't be changed under current test mode.
- 91** Can't mount or unmount SMEM
Can't mount or unmount password recovery card
Duplicate ports specified
Option not programmable for this NPC type
SR NPC was specified - not allowed
Sync is not configured yet
- 92** Boot TLI failed
Can't mount or unmount PMEM
Transmitting port cannot be dropped
- 93** All digroups not out of service
PA NPC threshold already in inhibit mode
SMEM is not present
TB type in hardware mismatches DB
The conference does not exist
- 94** Conference port is not in conference circuit
Mate RT/DL mode is different
PA NPC threshold already in allow mode
SMEM unit is not restored
- 95** Invalid option, mailbox or flag
Range overlapping between FROM and TO or between two TOs
TG East/West type inconsistent with each other or circuit
- 96** Conference already exists
Subject PWR to be cleared is not failed

cc *Explanation*

- Unit(s) OOS, and additional backup required
- incompatible HUB feature types
- 97** Conference port cannot be dropped out of conference by switch command
- Entity can't be addressed in this configuration
- User quit the menu
- option LOCAL already exists
- 98** Checksums verification failed
- Error in input
- Test Port release failed
- Unable to verify Configuration file since MP DB not loaded
- option REMOTE already exists
- 99** G1 SMEM for SMEM->PMEM w/journals
- No Facility Line Interface (FLI) is In Service
- Unit type (xyz) not supported
- can't change option, protection switch is active
- 9A** Formatter (FMT) on active CCN side is Out-Of-Service
- can't change option, inhibition is active
- hub id not set when MJU pack grown
- 9B** INCL must be specified for SRDC ckts
- Termination is under test or is a test port or group
- The MXR is not grown
- 9C** Parity channel cannot be within the range of a DS0 command.
- SRDC timeslots are allocated on this NPC
- The MMFG is already In-Service
- 9D** Attempt to remove a Service MIU which is under protection
- NPC containing channel 000 is invalid type.
- current hub id specified in command
- 9E** MONDAT set to ALL is not allowed
- 9F** MONTIM set to ALL is not allowed
- current error corrector pack type specified in command
- A0** Illegal LEG LEG combination
- No SAFE alarm for DGP
- Not a CRO TLI
- TS16 specified for CAS TG
- The selected MXR associated with the NPC is Out-Of-Service
- A1** CRO type TLI (SSP portion not required)
- Illegal BBL BBL combination
- Loop back inhibited for digroup
- NPC has been designated as NPCTG
- The parameter specified does not match with the NPC type
- The selected MXR associated with the NPC is In-Service but failed
- A2** All channels assigned, cannot be grown as NPCTG
- Illegal BRD BRD combination
- SSP number is illegal
- The requested digroup is carrying service
- The selected MIU associated with the NPC is Out-Of-Service
- A3** Channels assigned, cannot be grown as test group

cc *Explanation*

Illegal SYM BRD combination
 LLB not initiated
 SSP number required
 The selected MIU associated with the NPC is In-Service but failed
 Transmic 1G NPC designated as SYNC source invalid

A4 Both syncs are in-service
 Firmware timing invalid for Transmic 1G NPC
 Illegal BRD SYM combination
 NPC is not a NPCTG
 The MXR diagnostics failed

A5 (Timing Distributor) TLI is not equipped
 AIS keyword incompatible with NPC type
 Autonomous loopback is active on DGA
 FPI on SMEM does not match one on PMEM
 Illegal BBL SYM combination
 Test group is not idle or frame is not In Service

A6 Deny SLC for Alternate maps
 Illegal SYM BBL combination
 Invalid switch request for DCLU
 Test group release failed
 The MIU diagnostics failed

A7 Deny non-channelized NPCs for Alternate Maps
 LEG mode was assigned to a DSPU-type NPC on the input
 NPC has been designated as NPCTP
 Sync 0 is not in-service
 The MIU boot failed

A8 A DMB mode was assigned to a FTU-type NPC on the input
 NPCTG not grown
 Sync 1 is not in-service
 The MMFG is Out Of Service

A9 Both syncs are out-of-service
 Circuits TCONed itself cannot be UTST
 Cross-connect not consistent with feature package
 INCL not specified and at least one NPC In Service
 No unmapped time slot
 Trying to add a BBL to a DMB conference that already has one

AA DSPP pack UC Failed or Out of Service
 NPC is NPCTG, changing to CAS/NSA is not allowed
 Range entered without FRC keyword
 Syncs are equipped

Trying to add a broadcast leg to a conference set up as SYM
AB Bad sync mode
 DSPP pack FTMI Failed or Out of Service
 FRC specified for protection, and service MMFG is In Service

Trying to add a SYM leg to conference set up as broadcast
AC DSPP pack NPC Failed or Out of Service
 No protection is available for the Service MMFG

cc *Explanation*

- Timing Extractor type TLI (need SSP info)
Trying to add a BBL leg to a conference set up as SYM
- AD** Not Timing Extractor type TLI (not SSP)
The Protection MMFG is selected, and auto. switchback is unavailable
- AE** A substrate circuit pack is specified in the command line
MXR is failed
NPC used as a timing reference
Wrong TLI type (need CRO grow command)
- AF** 3 Timing Distributor type TLIs are equipped
Delete or change a leg from a conference that has no leg
MIU is failed
Number of SLC RT's on each unit is limited to 80
- B0** Bad use of INCL, cannot override the current state of the conference
Combination of bit g (b7) and h (b8) is invalid
FLI is out of service
Unit 1 denied request
- B1** Bad use of INCL, cannot use keyword on conf.-to-conf. connection
FMT is out of service
Illegal priority value
Unit 2 denied request
- B2** Illegal SSP type (not same as other SSPs)
MXR is out of service
Transmission parameters in command will not change existing settings
Unit 3 denied request
- B3** MIU is already in service
Trying to change level out on BRD leg
Unit 4 denied request
X option is illegal
- B4** NPC is channelized type
Trying to change level in on BBL leg
Unit 5 denied request
Y option is illegal
- B5** CPR circuit pack specified in the command
NPC is a test port
Unit 6 denied request
Z option is illegal
- B6** C-bit operations are enabled
Sync architecture is same
TO side is not a DMB type NPC
The MXR boot failed
- B7** Cannot perform DMB CHG on input direction F
No DSP unit equipped
Some TLIs are still equipped
The associated MXR is In-Service but pested
- B8** CRO is still equipped
Cannot perform DMB CHG on input direction T
No CBTYPE NPC equipped

cc *Explanation*

- B9** Cannot perform DMB CHG on input direction B
No CBTYPE NPC capacity remaining
Timing Extractor type TLIs are present
- BA** Inactive side NPC out of service and inactive side in service
TLI 3 or 4 still equipped
- BB** Timeslot channel numbering not allowed with CAS
- BC** DGA and DGB must be specified together in the command
SSP with 0 priority present
- BD** DGC and DGD must be specified together in the command
Looped Circuit Access not allowed
SSP with non 0 priority present
- BE** Hardware mismatch or not present
NPC type option Y is invalid for SLC-96 NPC
- BF** MIU is not equipped
Sync mode is same
- C0** Cannot perform DMB CHG on input direction L
NPC addressing scheme selected is not allowed in the configuration file
Sync stratum is same
- C1** Cannot perform DMB CHG on input direction G
Stratum not allowed
- C2** Cannot perform DMB CHG on input direction A
ETSI cannot be initialized when ECCN side is OOS or inservice but pested
SSP type(options) same
- C3** Can't perform DMB CHG because NTR flag set on FROM side
Wrong SSP type(Timing Extractor type)
XMIT continuity test won't be run: CFT code specified
- C4** Can't perform DMB CHG because NTR flag set on TO side
Sync architecture different
XMIT continuity test won't be run: no XMIT timeslots available
- C5** Option NOT leg can not appear with F, T, or B
RCV continuity test won't be run: no available inservice NPC for FC/FMT
Some priority values required
- C6** No available timeslots on any of the inservice NPC associated with FC/FMT
Option NOT leg is not a FTU leg
Some priority values not required
- C7** Option NOT leg is not in conference
Priority values are same
RCV continuity test won't be run: no DMB timeslots available
- C8** Exceeded depth limit of 6 on broadcast conference concatenation
RCV continuity test won't be run: at least one timeslot in use
Sync pack denied command
- C9** CATP due to skipping continuity test for FMT
In-service NPC change not allowed
Syncs failed to cross couple
The INCL keyword is needed for DGA
- CA** Connectivity can not be specified for CEF unit
Mate sync pack denied command

cc *Explanation*

- New NPC same as existing one
- No protection switch is currently active
- CB** NPC parameter only valid with TU type TLI
- Protection entity out of service or failed
- Skip error summary since adjacent pack not in service or pested
- Sync not completely reset
- CC** NPC is still provisioned to provide sync timing
- Protection entity is unequipped
- RCV continuity test won't be run: SYNC OOS or pested
- CD** Data link failed
- NPC not designated as sync timing source
- Subject NPC does not support CEPT BER feature
- CE** CCI is out of service
- Far end failed to respond
- NPC already allocated as sync timing source
- CF** MIU is out of service
- NPC already grown as non-synchronization source
- SYNC is inservice but failed
- D0** Command is Frame administrator (DAX) only.
- FROM NPC is not provisioned as DGA
- D1** CCI is not present
- Cannot create any more users
- Protection switch existing is autonomous
- TO NPC is not provisioned as DGA
- D2** ETSI is not present
- Protection switching is already inhibited
- User has been created
- D3** CCNI is inservice but failed
- Corresponding NPC for FROM virtual channel is not provisioned
- Protection switching is already allowed
- User does not exist
- D4** A user is already logged in on the link/vc
- Active CCN side is out of service
- CCI is inservice but failed
- Corresponding NPC for TO virtual channel is not provisioned
- D5** Boot in progress, can't service request
- CCB is not equipped
- No user is logged in on the link/vc
- D6** CCB is out of service
- Incorrect or missing password
- Invalid FROM channel number
- D7** CCB is inservice but failed
- Cannot execute privileged command
- Invalid TO channel number
- D8** Cannot remove Frame administrator
- ETSI is not equipped
- D9** ETSI is out of service

cc *Explanation*

- Invalid FROM channel number range
- User has logged in somewhere
- DA** ETSI is inservice but failed
- Invalid TO channel number range
- User is not logged in
- DB** FC is inservice but failed
- User still owns files
- DC** A loopback is active on the FROM termination
- No zeros allowed for DAX privilege
- DD** A loopback is active on the TO termination
- FMT is in service but failed
- Password recovery card is not READ-only
- DF** Command and protocol are inconsistent
- FLI is inservice but failed
- Unmatched channel range
- E0** Bad FAC value entered
- ETSI not equipped, not in service, or failed
- Hardware database mismatch
- Unmatched channel range involving SLC Mode III termination
- E1** A locally switched channel is specified as BBL, LEG, or BRD
- No Memory Backup Has Been Scheduled
- Virtual circuit is not specified for X.25 link
- E2** Attempt to one way cross-connect a locally switched channel
- Invalid link number specified
- E3** Attempt to broadcast a locally switched channel
- Can't Use LCN 0/LGN 0 - designated as a supervisory channel only
- Invalid keyword(s) combination specified
- One way unassigned channel/NPC in QRY,TO
- E4** Broadcast unassigned channel/NPC in QRY,TO
- Invalid NPC addressing scheme specified
- NPC already has Equipment Loopback
- RT-DCLU cross-connect with different ids
- E5** Adding DL DGP forbidden for SLC 96 MD 1
- Invalid combination of "x" and "z" values
- No user/link needs to be changed
- RT-DCLU cross-connect with different channel number
- E6** Cross-connect a non Mode I channel to DCLU
- DB SMEM error OP-CL-RD-WR-SK
- No DL digroups can be added until the associated RT bank is created
- E7** Cross-connect a non SLC channel to DCLU
- Invalid combination of "x" and "y" values
- PMEM not restored
- E8** Other FLI is OOS
- SC invalid for cross-connection specified
- E9** MUX or TRB invalid for cross-connection specified
- There are no INS MXRs to run test on
- EA** AIS invalid for cross-connection specified

cc *Explanation*

- XON/XOFF flow control is supported only on Snider link
- EB** ENQ/ACK flow control is supported only on Snider link
NAM invalid for cross-connection specified
- EC** Invalid channel 000 cross-connection specified
- ED** Invalid channel 031 cross-connection specified
OLD termination is not mapped
- EE** Trunk type is not allowed in the circuit specified
- EF** Invalid circuit type
SSC circuit pack is still equipped; pull-out/remove SSC
Software does not contain Enhanced CEPT feature
- F0** Clock absent for XPC to loop back
Range not allowed for circuit type
SSC Diagnostic Failure
- F1** File has already been cleared
PMEM and SMEM synchronization fail
Parameter only valid with PA, PB, or PC type NPCs
- F2** Invalid NPC number specified
Not a DACS II compatible Flash Card
- F3** Flash Card is empty
Maximum number of CPRs have already been grown for this unit
- F4** OLD and NEW channels cannot be the same
PMEM and SMEM are different
- F5** Conference first channel doesn't match input
Flash Card is not present
INCL keyword needed to perform this command
- F6** Flash Card is bad
Leg type mismatch
T1DM or DMI mode and channel 24 is connected
- F7** Can't mount or unmount old_tape
Corresponding NPC for virtual channel is not provisioned
OLD data channel cannot be parity channel type
- F8** OLD and NEW Data and Parity channels partially overlap
Old_tape is not present
- F9** Cannot clear journals for OOS unit
Mate NPC (DGA/DGP) is in service
Old_tape unit is not restored
- FA** Bad old_tape DB generic
SSC software out of date
The mode of the RT is not applicable
- FB** Old_tape with journal
PMEM verification failed
- FC** Invalid executable on card
Superuser logged on
ZBTSL option is only valid with the ESF mode
- FD** Command not allowed
Line Loop Back is active
NPC range crosses unit boundary

cc *Explanation*

- Problem occurred while accessing old_tape
- FE** AIS entered for MONE/MONF/MONEF/SPLTA/SPLTB/SPLTAB
Change to non-ESF digroup with 16-state cross-connect
Fail transfer DB from old_tape to SMEM
- FF** Change to T1DM digroup with cross-connect that is not TRSP
DB retrofit fail
Termination is in process of being rolled

cccc *Explanation*

- 0000** No conditions
- 0001** CEC bit on PRISM not cleared
- 0002** Firmware error
- 0003** Transmit underrun threshold exceeded
- 0004** Bad EMXR Acknowledgement
- 0005** Timeout while waiting for msg from EMXR
- 0006** RAM data error
- 0007** Invalid code checksum
- 0008** Error in PRISM register
- 0009** Error in HSCC register
- 000A** EPROM checksum error
- 000B** Timer 1 error
- 000C** Timer 2 error
- 000D** DUART error
- 000E** MIU access error
- 000F** CPU internal bus error
- 0010** CPU parallel bus parity error
- 0011** CPU serial bus parity error
- 0012** FLI register bit stuck
- 0013** FLI lock and key alarm
- 0014** MXR DS3 loss of signal
- 0015** MXR unknown error
- 0020** BX Access Error
- 0021** BX Ram Parity Over Low Byte
- 0022** BX Ram Parity Over High Byte
- 0023** Fan Bank Zero Error Flag
- 0024** D5 Spare Bit Error
- 0025** Fan Bank One Error Flag
- 0026** D7 Spare Bit Error
- 0027** BX stuck summary bit
- 0028** Unknown interrupt from BX
- 0029** Error from side 0 bus extension
- 002A** Error from side 1 bus extension
- 002B** Unknown interrupt from MTC
- 002C** MTC stuck summary bit
- 002D** Unused bits on MTC pack

cccc	<i>Explanation</i>
002E	Error due to unused bit
002F	Error due unknown reasons
0030	Power Failure
0031	Sanity Time-out
0032	BX stuck CCNI summary bit
0033	FMT TF control bus error
0034	MXR M23 summary stuck error
0035	FMT multiple TF network data error
0036	FMT single TF network data error
0037	FMT TF device or clock receiver error
0038	FMT multiple TF clock error
0039	FMT single TF sync error
003A	FMT multiple TF sync error
003B	FLI access error
003C	FLI communication link error
003D	DPC ROM error
003E	DPC loss of timing
003F	OOS RAM test ran while IS
0040	Bus Error Alarm
0041	CIA Device Error
0042	CIB Device Error
0043	CIC Device Error
0044	Pack can't be accessed
0045	Loss of timing alarm
0046	Chip ID Comparison
0047	Data Strobe Signal
0048	Address Parity Error
0049	FC Stuck Bit on FTMI
004A	DDC Stuck Bit on FTMI
004B	FTMI lost clock
004C	FC can't be accessed
004D	Timer Error
004E	Circuit ID Error
004F	Transmit Formatter Error
0050	Receiver Formatter Error
0051	Sanity Timer Interrupt
0052	RF bus error
0053	NPC bus error
0054	NPC can not be accessed
0055	NPC is alarming on FC
0056	Facility Processor Sanity Error
0057	SYNC Error
0058	Channel controller loss of clock
0059	Channel controller frame sync error
005A	CC configuration register error
005B	CC instruction ram error
005C	CC parity error

cccc	<i>Explanation</i>
005D	CC transmit data error
005E	CC receiver data error
005F	CC exercise error
0060	CC summary bit error
0061	Hard RAM error
0062	Hard ROM check error
0063	Hard Error stuck bit
0064	Transceiver A stuck bit
0065	Transceiver A transmit slip
0066	Transceiver A Error
0067	Transceiver B stuck bit
0068	Transceiver B transmit slip
0069	Transceiver B Error
006A	Circuit ID Error
006B	Facility errors
006C	NPC address parity error
006D	DSPI access error (e.g. pack not there)
006E	DSPI bus data parity error
006F	DSPI bus address parity error
0070	DMB access error (e.g. pack not there)
0071	DMB serial access error (pack not there)
0072	DMB parallel access error
0073	DMB bits stuck in exercise register
0074	DMB data processing error
0075	Multiple data parity error, CCB problem
0076	DMB clock error
0077	Multiple clock errors, CCB/SYNC problem
0078	DMB FIFO error
0079	Possible power failure on side
007A	DMB control memory error 0 (used for trans)
007B	DMB control memory error 1 (used for trans)
007C	Control Memory 0 control ram parity error
007D	Control Memory 1 control ram parity error
007E	Control Memory 0 control interface error
007F	Control Memory 1 control interface error
0080	Control Memory 0 loss of sync error
0081	Control Memory 1 loss of sync error
0082	Control Memory 0 DMB input data parity error
0083	Control Memory 1 DMB input data parity error
0084	DMB conference error 0 (used for trans)
0085	DMB conference error 1 (used for trans)
0086	Conference 0 control interface error
0087	Conference 1 control interface error
0088	Conference 0 control ram parity error
0089	Conference 1 control ram parity error
008A	Conference 0 DMB input data parity error
008B	Conference 1 DMB input data parity error

cccc	<i>Explanation</i>
008C	Conference 0 DMB device (chip) error
008D	Conference 1 DMB device (chip) error
008E	Bad Ram Data in DMB device (bits alarms)
008F	Bad Ram Data in DMB device (bits alarms)
0090	CCNI access error (cannot access pack)
0091	High data byte bus parity error
0092	Low data byte bus parity error
0093	Address bus parity error
0094	Autonomous switch enable error
0095	Bus status register parity error
0096	CCNI stuck register bit, summary set, no other alarms
0097	MXR communication link error
0098	CPR serial access error
0099	CPR clock error
009A	CPR processor interface failure
009B	CPR input data interface error
009C	CPR D-Bit interface parity error
009D	CPR control memory failure
009E	CPR control memory or state machine failure
009F	CPR FIFO FRDY/FFULL stuck bit
00A0	CCB packid error, wrong pack, can't read pack
00A1	CCB sync pulse error
00A2	CCB clock error
00A3	CCB input port alarm error
00A4	CCB zero bit is stuck at 1
00A5	Corresponding CCNI bit is stuck
00A6	MXR channel controller transmit data error
00A7	MXR channel controller receiver data error
00A8	MXR channel controller exercise error
00A9	MXR channel controller stuck bit error
00AA	MXR transceiver framer error
00AB	MXR transceiver receive sync error
00AC	MXR transceiver transmitter error
00AD	MXR M23 device error
00AE	MXR M12 device error
00AF	MXR M12 summary stuck error
00B0	Pack id error, can't read pack
00B1	TSI stuck bit, summary bit set, no devices alarming
00B2	TSI device error
00B3	TSI device id error, cannot read device
00B4	Illegal exercise bits set
00B5	Bus address error
00B6	Device clock error
00B7	Device control ram parity error
00B8	Output data parity error (from an FTM)
00B9	Corresponding CCNI bit is stuck
00BA	FLI loss of clock

cccc	<i>Explanation</i>
00BB	FLI loss of signal
00BC	FLI circuit id error
00BD	FLI frame sync or internal error
00BE	FLI address bus parity error
00BF	MJU serial access error
00C0	MJU clock error
00C1	MJU processor interface failure
00C2	MJU input data interface failure
00C3	MJU error correction circuitry failure
00C4	MJU control memory failure
00C5	MJU output block failure
00C6	MJU sampling circuitry failure
00C7	MJU control memory or state machine failure
00C8	SRM serial access error
00C9	SRM clock error
00CA	SRM processor interface failure
00CB	SRM input data interface failure
00CC	SRM error correction block failure
00CD	SRM control memory failure
00CE	SRM multiplexor block failure
00CF	SRM output block failure
00D0	CPU RAM Parity error
00D1	Source of error is unknown
00D2	Source of error was not found
00D3	Stuck bit in register
00D4	Bad UBX pack
00D5	Illegal/unknown condition code
00D6	MIU communication link error
00D7	FMT communication link error
00D8	MXR ROM error
00D9	MXR LCA error
00DA	MXR queue overflow
00DB	MXR channel controller loss of clock
00DC	MXR channel controller frame sync error
00DD	MXR channel controller configuration register error
00DE	MXR channel controller instruction ram error
00DF	MXR channel controller parity error
00E0	Hardware database mismatch
00E1	Hardware Failure
00E2	Hardware Boot Failed
00E3	Can't access link
00E4	Transmit Time-out
00E5	Receiver Time-out
00E6	softerr failure which forces link removal
00E7	Unit could not be reset
00E8	Unit failed sanity check
00E9	failure to insert TCC

cccc	<i>Explanation</i>
00EA	failure to remove TCC
00EB	failed to switch CCN sides
00EC	NPC's facility queue overflow condition
00ED	Duplex entity failed diagnostics
00EE	Lost Clear-To-Send signal on X.25 links
00EF	Frame Audit reboot DDC failure
00F0	FMT access error
00F1	FMT timing error
00F2	FMT link id error
00F3	FMT bus timeout
00F4	FMT serial address parity error
00F5	FMT 0-4TF timing error
00F6	FMT 0-4TF timing error
00F7	FMT error summary 1 stuck bit
00F8	FMT timing error, RF data parity
00F9	FMT error summary 2 stuck bit
00FA	FMT lock override, active select or kill parity
00FB	FMT FIFO or control PROM error
00FC	FMT RF control bus error
00FD	FMT RF port and monitor alarms
00FE	FMT RF port alarm; no monitor alarms
0101	CCI pack is not present
0102	Can't communicate to CCI pack(incorrect version number)
0103	CCI pack's summary is set but has no errors
0104	CCIERR bit is stuck in system status reg
0105	TSIERR bit is stuck in system status reg
0106	PUERR bit is stuck in system status reg
0107	Bus Terminator pack is not present
0108	The 32 MHz clock is out of lock
0109	CCI 240 sync is misaligned with frame sync
010A	CCI loss of 240 Frame Sync
010B	CCI loss of 8 KHz Frame Sync
010C	CCI detected Address Parity error
010D	CCI detected low byte data parity error
010E	CCI detected high byte data parity error
010F	CCI -5.2 power supply has failed
0110	CCI detected Bus Status Parity error
0111	CCI Peripheral Unit Alarm
0112	SYNC summary is set on CCI circuit pack
0120	ETSI pack is not present
0121	Can't communicate to ETSI pack (incorrect version number)
0122	ETSI pack's summary is set on CCI but has no errors
0123	ETSI loss of 32.768 MHz clock
0124	ETSI loss of 240 frame sync
0125	ETSI Rcv MDX summary stuck bit
0126	ETSI control RAM summary stuck bit
0127	ETSI TX MDX summary stuck bit

cccc	<i>Explanation</i>
0128	ETSI loss of Vdd (3.3v) power
0129	Peripheral unit port alarm (RCV MDX)
012A	Receive MDX data source time slot parity error
012B	Receive MDX sync error
012C	Receive MDX address parity error
012D	Receive MDX write data parity error
012F	Receive MDX can't be accessed (incorrect chip Id)
0130	Transmit MDX data parity error
0131	Transmit MDX data source time slot parity error
0132	Transmit MDX sync error
0133	Transmit MDX address parity error
0134	Transmit MDX write data parity error
0135	Transmit MDX can't be accessed (incorrect chip Id)
0137	Control RAM parity error
0138	Control RAM sync alarm
0139	Control RAM port alarm
013A	Control RAM BIST flag is set
013B	Data RAM BIST flag is set
013C	Control RAM address parity error
013D	Control RAM write data parity error
013E	Control RAM device can't be accessed (incorrect chip Id)
013F	Control RAM circuit pack parity
0140	Control RAM device is in reset state
0141	Control RAM port alarm summary is stuck
0142	ETSI TRD3ST exercise bit is set
0143	ETSI ready high error on CCI
0144	ETSI ready time-out error on CCI(ETSI can't be accessed)
0145	Control RAM stuck bit error
016D	Invalid FPA state
016E	Invalid DDC pack id
01E1	MXR access error (can't access pack)
01E2	MXR hard error stuck bit
01E3	MXR facility error stuck bit
01E4	MXR pack is in reset state
01E5	MXR PIF Bus Parity Error
01E6	MXR loss of clock from unselected FLI
01E7	MXR 45MHz is not phase locked to system clock
01E8	MXR firmware error
01E9	MXR HSCC device error
01EA	MXR PIF I/O device error
01EB	MXR M13 summary stuck bit error
01EC	MXR transceiver summary stuck bit error
01ED	MXR program error
01EF	MXR RAM error
01F0	EMXR Timer error
01F1	EMXR DUART error
01F2	MIU got reset

cccc	<i>Explanation</i>
01F3	Timeout for Yellow Inhibit/Enable Request
01F4	Queue overflow error
01F5	Packet layer parameters are mismatched between DACS II and the network
01F6	Failed to write XPC register
01F7	Transmit time-out because Clear To Send lost
01F8	R20 counter reaches limit
01F9	T3 timer expires
01FA	Too many interrupts or illegal interrupt from XPC
E000	CCNI summary bit set; no more info
E001	Sync says its down
E002	Sync says its time base is down
E003	SYNC autonomously restarted itself
E004	MP-SYNC communications failure
E100	Unknown DPLL error
E101	ROM checksum error
E102	RAM data error, RAM address line stuck
E103	Phase/frequency output latch error
E104	Loss of energy on output of frequency synth.
E105	Loss of energy on output of phase shifter
E106	Loss of energy on generated SYNC pulse
E107	Loss of energy on time base strobe signal
E108	Interrupt controller error
E109	Interrupt holding register error
E10A	Uart error
E10B	Control data readable output latch error
E200	Unknown time base error
E201	Time base loss of energy detector
E202	TB i/o err. cant read TB packid or oven monitor
E203	Time base frequency drift
E204	Both syncs time base oven is cold
E205	Time base oven is cold
E300	Unknown PLL error,link went down before reading status
E301	PLL end of range
E302	PLL excessive phase error (125 uSec out of phase)
E303	PLL real time violations
E304	PLL fast start time out
E305	PLL end of range implicating TL
E400	Unknown mate error, link went down before read status
E401	Mate out of service
E402	Mate sync hardware error
E403	Cross couple loss of energy
E404	Cross couple loss of energy
E405	Mate link down
E406	Cross couple real time violation
E407	Cross couple fast lock range
E408	Cross couple frequency offset error
E409	Cross couple out of lock

cccc *Explanation*

E500	TLI error, link went down before status read
E501	TLI hardware error
E600	TL error reported, unknown
E601	TL out of service or loss of signal
E602	Timing Extractor type TLI has hardware problem
E603	Timing Extractor type TLI has autobaud failure
E700	CRO error, unknown due to link, SYNC error
E701	CRO loss of energy detected SYNC error
E702	CRO loss of energy CRO error
E703	CRO frequency offset
E704	CRO declared OOS
E805	TL error cleared
E806	TLI error cleared
EF00	Unknown what sync switched to
EF01	SYNC switched to NORMAL mode
EF02	SYNC switched to HOLDOVER
EF03	SYNC switched to FAST mode
EF04	SYNC switched TLIs/SSPs
EF05	SYNC switched to cross couple

Glossary

A

ABT

Abort

ACO

Alarm Cutoff

Active

For duplicated entities, the entity is providing service rather than operating in hot standby.

AI

Alarm Interface

AIS

Alarm Indication Signal (also known as all 1s signal)

Alarm Delay

The alarm delay (in seconds) for software-detected alarm conditions. Initial value is 20 seconds.

Alarm Indication Signal (AIS)

A signal transmitted downstream to indicate that network transmission line failures were detected upstream.

All Ones Signal

Another name for DS1 Alarm Indication Signal (AIS). It is defined to contain all ones in the terminal-to-terminal mode.

ALM

Alarm

Alphanumeric Characters

Letters and digits.

Alternate Mark Inversion (AMI)

A DS1 line code in which alternate one bits are positive and negative, but zero substitution is not used.

AMI

Alternate Mark Inversion

ANSI

American National Standards Institute

AS&C

Alarm Surveillance and Control

ASCII Character

Letters, digits, and symbols used in the American Standard Code for Information Interchange.

ATAG

Autonomous Message Tag

ATP

All Tests Passed

Attribute

Alarm indication level: major, minor, or no alarm.

AUD

Audit

Autolock

When the system autolocks an entity, it switches to protection and forbids return to the working entity even if the trouble clears. This is usually caused by multiple protection switches on that entity in a short time period.

Autolock Number of Switches

This parameter is the number of times that the system restores an entity to service (after intermittent failures) in a given autolock switching interval before the entity is autolocked.

Autolock Release Time

The number of hours between times when the system automatically releases autolock.

Autolock Switching Interval

An interval in minutes (see Autolock Number of Switches).

Autonomous

Done automatically by the system without any manual intervention from the user.

Autoprovisioned

Put in the provisioned state automatically by the system.

B

B3Zs

Bipolar with 3-zero substitution, a DS3 line code.

B8ZS

Bipolar Eight Zero Substitution

Baud Rate

Transmission data rate (bits per second) on an administrative link.

BBL

Backbone Leg

BC

Bus Controller

BCON

Broadcast Cross-Connect

BDIS

Broadcast Disconnect

BER

Bit Error Rate

BER Metric

Specifies the metric for calculating bit error rate at a DS3 interface port. Options are bipolar variations (BPV) or parity (PTY). (Initial value is BPV).

Bipolar Violation

A violation of the alternating +1, -1 pattern in a 3-level code.

Bit Error Rate Threshold

3 stands for 0.001, 6 stands for 0.000001.

Blue Code

Same as AIS

BMTR

Back-up Memory Transfer

Boot

To transfer contents of a Memory Card into the system's working memory and system hardware. The contents of a Memory Card can include both system software and database.

BOS

Bit Oriented Signaling

BPV

Bipolar Violation

BRD

Broadcast Leg

Broadcast

Form a bridge connection.

BSRF

Basic Synchronization Reference Facility

BT

Bus Terminator

BX

Bus Extender

Byte

Usually refers to a group of eight consecutive binary digits, but sometimes used for bit groups of other sizes.

C

CAS

Channel Associated Signaling

CATP

Conditional All Tests Passed

CBIT

A DS3 line code in which parity checks on blocks of data are used to detect bits in error.

CCB

Cross-Connect Buffer

CCI

Clock and Control Interface

CCIS

Common Channel Interoffice Signaling

CCITT

International Telephone and Telegraph Consultative Committee

CCN

Cross-Connect Network

CCNI

Cross-Connect Network Interface

CEF

Capacity Expansion Frame

CFA

Carrier Failure Alarm

CFR

Synchronizer Configuration

CGA

Carrier Group Alarm

CHG

Change

CI

Communications Interface

CIU

Craft Interface Unit

Clear (CL)

An alarm condition no longer exists.

CLF

Carrier Line Failure

CMAP

Channel Map

COFA

Change-Of-Frame-Alignment

Condition

The type of alarm indication.

CP

Circuit Pack

CPR

C-Bit Processor

CPU

Central Processing Unit

CRC

Cyclic Redundancy Checking

CRO

Clock Reference Oscillator

Cross-Connect

A piece of hardware used to interconnect line-terminating equipment, multiplexers, and other equipment.

Cross-Connection

An interconnection between two specified NPC channels.

Crosstalk

A signal induced into one transmission line from another transmission line.

CRT

Cathode Ray Tube

CSS

Controlled Slip Seconds

CTAG

Correlation Tag

Current Value

In the dialog mode, it indicates that the current value of a parameter is used by the system unless you direct otherwise.

CV

Coding Violations

D

DACS

Digital Access and Cross-Connect System

Database

A record of the system configuration and status. It contains cross-connections, status of entities and transmission lines, performance monitoring threshold values and collected data.

DATS

Digital Access Test Set

DC

Digroup Circuit or Direct Current

DCC

Disconnect Code

DCLU

Digital Carrier Line Unit

DDC

Dual Digroup Circuit

DDS

Digital Data System

Default

A value the system automatically uses for a parameter if you do not specify a value.

Delimiter

A colon, comma, or space used to separate two parameters in a command or message.

Demultiplexer

A device used with a multiplexed signal for recovering signals contained within it and restoring the distinct individual channels of these signals.

DFB

Dual Fuse Board

Diagnose

Test an entity.

DIF

DACS Interface Module

DL

Data Link

DLC

Digital Loop Carrier

DM

Dual Multiplexer

DMA

Deferred Maintenance Alarm

DMAP

Digroup Map

DMB

Digital Multipoint Bridge

DMI

Digital Multiplex Interface

DMM

Digital Multimeter

DOTS

Digital Office Timing Supply

DPC

Dual Primary Circuit

DPLL

Digital-Phase Locked Loop

Driven

A driven port is being monitored, and a good signal is expected.

DS0

Digital Signal Level 0 (64-kb/s)

DS1

Digital Signal Level 1 (1.544-Mb/s)

DS1 Data Rate

The DS1 Data Rate is calculated as follows:

$DS1 = (24 \text{ Channels} \times 8 \text{ bit/sample} + 1 \text{ frame bit}) \times 8000 \text{ samples/sec}$

$DS1 = 193 \times 8000 = 1.544 \text{ Mb/s}$

DS1 Port

A DS1 port in either a DS1 interface module or a DS3 interface module.

DS3

Digital Signal Level 3

DS3U

DS3 Unit

DSP

Digital Signal Processor

DSPC

Digital Signal Processor Circuit

DSPI

Digital Signal Processor Interface

DSPU

Digital Signal Processor Unit

DSU

Data Service Unit

DSX

Digital Signal Cross-Connect

DTAC

Digital Test Access Connector

Duplex Entity

A pair of entities in which one is active and the other is in hot standby (clock generators).

Duplicated Entity

A pair of entities in which one is active and the other is in hot standby (for example, the Synchronizer Cross-Connect (SXC) circuit packs).

E

E1 Data Rate

The E1 Data Rate is calculated as follows:

$E1 = (32 \text{ Channels} \times 8 \text{ bit/sample}) \times 8000 \text{ samples/sec}$

$E1 = 256 \times 8000 = 2.048 \text{ Mb/s}$



NOTE:

With this data rate, 30 channels carry traffic and two channels are reserved; one channel contains framing information and the other channel contains signaling information.

E2A

Type of Alarm Telemetry

EBX

Expanded Bus Extender

ECCN

Expanded Cross-Connect Network

Echo

Display of keystrokes entered from a terminal (passwords are not echoed).

ECI

Enhanced Communications Interface

EDDC

Enhanced Dual Digroup Circuit

EDPC

Enhanced Dual Primary Circuit

EER

Excessive Error Rate

EFC

Extended Frame Controller

EIA

Electronic Industries Association

EID

Entity Identification

EMC

Electromagnetic Compatibility

EMIU

Expanded Multiple Interface Unit

EMTC

Expanded Maintenance Circuit

Enter

Provision an entity by a command, not automatically by the system.

Entity

A specific piece of hardware (such as the Main Controller (MC) or Network Processing Circuit (NPC)) that has been assigned a name and is recognized by the system.

Entity Identifier

The name used by the system to refer to an entity.

Equalizer

A circuit adjustment used to maintain signal strength between desired limits.

Equipped

The entity is entered in the system database via a user provisioning command.

ER

Error Rate

ERS

Errored Seconds

ES

Errored Seconds

ESD

Electrostatic Discharge

ESF

Extended Superframe

ESR

Error Source Register

ESR1

Error Source Register 1

ESR2

Error Source Register 2

ETSI

European Telecommunication Standardization Institute

F

FAL

Fuse Alarm Lamp

FAS

Frame Alignment Signal

FC

Format Converter

FDL

Facility Data Link

Fe

Extended Superframe Format

FEBE

Far-End Block Error

FELP

Far End Loopback

FES

Far-End Errored Seconds

FLI

Facility-Line Interface

FMAC

Facility Maintenance and Administration Center

FMT

Formatter

Forced

A traffic-carrying entity (either service or protection) has been deliberately locked into a service providing state by manual command despite being bad.

FPA

Feature Package A

FPB

Feature Package B

FPC

Feature Package C

FRADT

Frame Audit

FRER

Framing Bit Error

F_s

Fx Framing Format

FSES

Far-End Severely Errored Seconds

FTM

Facility Terminating Module

FTU

Facility Terminating Unit

FUAS

Far-End Unavailable Seconds"

FW

Framing Word



G

Grooming

Rearrangement of DS1 signals in DS3 signals.



H

HDB3

High Density Bipolar 3 Zero Substitution

HDS3U

DS3 Hybrid Unit.

Header

The first line of a message.

Header Date

Specifies the current date as YYMMDD, where YY is the last two digits of the year, MM is the month, and DD is the day of the month.

Header Time

Specifies the current time of day as HHMMSS, where HH is the hour (00 to 23), MM is the minutes, and SS is the seconds.

HECI

High-Speed Enhanced Communications Interface

HFMT

Hybrid Formatter.

Hierarchy

An orderly ranking or sequence of elements, such as that of menus presented at a terminal.

Hit

A disruption of service that lasts for less than 1 second. See Outage.

HMXR

Hybrid Multiplexer.

Hot Standby

An entity ready for fast, automatic placement into operation to replace an active entity.

HUBID

Hub Identifier

I

ICLD

Idled

Idle

An output port is idle if it is not cross-connected to an input port.

Idle Channel

A channel on an NPC that has not been cross-connected.

IFTU

Integrated Facility Terminating Unit

In Service

The entity is performing normal service functions, either active or standby.

ISX

Integral Shelf Cross-Connect

ITU-TSS

International Telecommunication Union-Telecommunication Standardization Sector

J

Jitter

Short term variations in the phase of a digital signal.

K

kb/s or kbit/s

Kilobit Per Second

kHz

Kilohertz

L

LAN

Local Area Network

LBO

Line Build-Out

LED

Light-Emitting Diode

LFA

Loss of Frame Alignment

LILB

Line Interface Loopback

Link ID

The location and type of a user interface link.

LLB

Line Loopback

LMA

Loss of Multiframe Alignment

Location

The specific entity involved.

Loopback

A circuit arrangement that causes a received signal to be returned to its source.

LOS

Loss of Signal

M

M13

A standard format used for DS3 signals

Maintenance

The entity has been locked into a non-service providing state by a manual command.

Maintenance Condition (MCOND)

MCOND is a condition in which the Main Controller (MC) is isolated from system hardware in order for the user to perform memory transfer operations. Placing the MC in MCOND is non-service affecting. When the MC is in the MCOND service state, the system software and database are not transferred to the Memory Cards. The Maintenance Condition enables the user to transfer database and/or system software among the Memory Cards and the MC's Random Access Memory (RAM) in a controlled manner via user commands. The MCOND service state is also used to perform system software upgrades.

Mapped

Cross-connected.

Mb

Megabit

Mb/s or Mbit/s

Megabit Per Second

MBER

Minor Bit Error Rate

MC

Main Controller

MCOND

Maintenance Condition

MCP

Main Controller Peripheral

MEMA

Memory Card Slot A

MEMB

Memory Card Slot B

Memory Location

Specifies the equipment, DS1 interface port, or DS3 MUX port location associated with a memory type.

MER

Multiframe Error

MI

Maintenance Information

MIU

Multipoint Interface Unit

MJU

Multipoint Junction Unit

MMFG

Multiplexer-MIU Functional Group or HMXR-MIU Functional Group

MML

HuMan-Machine Language

MP

Main Processor

MPDIS

Multipoint Disconnect

MPM

Multipoint Mode

MTC

Maintenance Circuit

MXR

Multiplexer

N

NA

No acknowledgement

NDL

No Data Link

NEBS

Network Equipment Building Systems

Network Element

A DACS II ISX system is a network element.

NFW

Not Framing Word

NG

No Good

NOBBL

No Backbone Leg

Notification Code

The notification code for alarm and status conditions, which include: MJ - major alarm; MN - minor alarm.

NPC

Network Processing Circuit

NPCTG

Network Processing Circuit Test Group

NPCTP

Network Processing Circuit Test Port

NSA

Nonsignaling Associated

NZCS

No Zero Code Suppression

O

OA&M

Operation, Administration and Maintenance

OCNT

One-Way Cross-Connect, Terminated

ODIS

One-Way Disconnect

OFS

Out-Of-Frame Seconds

OCON

One-Way Cross-Connect

OOS

See Out-of-service.

OS

Operations System

Out Of Service (OOS)

The entity is not providing its normal service function (removed from service) either because of a system problem or because it has been removed from service manually.

Outage

A disruption of service that lasts for more than one second. See Hit.

P

Parity Check

To determine whether a block of digital data has been corrupted in transmission, you can use an even-parity format in which an extra bit is added to the block at the transmitter if necessary so that the block always contain an even number of one bits. A parity-checking circuit at the receiving end can determine whether an error has occurred in transmission. An odd-parity format can also be used for the same purpose.

PBA

Primary Block Alarm

PBC

Primary Block Circuit

PBF

Primary Block Failure

PBX

Private Branch Exchange

PCM

Pulse Code Modulation

PCMCIA

Personal Computer Memory Card International Association

PDS

Program Documentation Standards (Language)

PF

Printout Follows

PFW

Pseudo-Frame Word

PLL

Phase-Locked Loop

PMA

Prompt Maintenance Alarm

PNI

Packet Network Interface

POTS

Plain Old Telephone Service

Primary Line

The second line in an output message.

Program

The software that directs the operation of the main controller and other frame elements.

Protocol

Detailed format and procedures used for transmitting digital data.

Protocol Type

Indicates the protocol supported on the interface link.

Provisioned

The entity has been configured by the user and entered into the system database and is ready to be restored to service.

PU

Power Unit

Pulse Code Modulation (PCM)

The process by which analog signals are sampled, quantized, and coded into a digital bit stream.

PVC

Permanent Virtual Circuit

R

R16

Remote Alarm Indication in TS16

RAI

Remote Alarm Indication

RAIS

Remote Alarm Indication Signal

RAM

Random Access Memory

RBER

Remote Bit Error Rate

RDC

Red Circuit

REER

Remote Bit Error

Released

If an input port, it is not under test access; if an output port, it is not cross-connected to an input port under test access.

RL

Retry later

RMS-D

Remote Measurement System - Digital

RMS-I

Remote Measurement System - International

Rollover

Operation used when the transmission facility between the system and an upstream system is to be replaced.

RT

Remote Terminal

RTS

Remote Test System

RTS-5A

Remote Test System 5a

S

SAP

Status and Alarm Panel

SARTS

Switched Access Remote Test System

SCC

Subrate Cross-Connect

SCCSAI

Switching Control Center System Asynchronous Interface"

SECH

Subrate Establish Command

SERS

Severely Errored Seconds

SID

Source Identifier

SNIDER

Protocol (message format) used on asynchronous administrative links.

Software ID

Gives the software version information for a system: g - is a one-digit number giving the software release; i - is a two-digit number giving the issue; r - is a one-digit number giving the point release.

SPU

Synchronizer Power Unit

SRM

Subrate Multiplexer

SSC

Secondary Storage Controller

SSP

Select Synchronization Port

Standby

Entity is one of a duplicated pair, but not providing service. It is ready to be used to replace a similar entity either by protection or by duplex switching.

State

The state of an entity indicates whether it is defective or normal, whether it is ready for normal use, etc.

Subrate

In the digital data system, a data bit rate that is either 2.4, 4.8, or 9.6 kb/s.

SVC

Switched Virtual Circuit

SYNC

Synchronizer

Synchronizer Cross Connect

A dual function circuit pack that performs both synchronization and cross-connect functions.

System Executables

The software that directs the operation of the Main Controller (MC) and other system entities.

T

T1DM

T1 Data Multiplexer

TABS

Telemetry Asynchronous Block Signal

TAD

Test Access Digroup

TB

Time Base"

TC

Trunk Conditioning

TCNT

Two-Way Cross-Connection, Terminated

TD

Timing Distributor

TDIS

Two-Way Disconnection

TDM

Time Division Multiplexed

Test Access

A mode of operation that provides full access to the circuit under test but does not interfere with any other cross-connections that have been established.

Test Mode

Specifies the Test Access Mode

TG

Test Group

TID

Target Identifier

TLA

Terminate and Leave Activate

TLI

Timing Link Interface

TLP

Transmission Level Point

TLR

Terminate and Leave Release

TP

Test Port

TPR

Test Port Release

TSI

Time Slot Interchange

TTY

Teletypewriter Terminal

UAC

Unassigned Channel Code

U

UAS

Unavaillable Seconds

UATC

Unavailable Time Count

UBX

Unit Bus Extender

UC

Unit Controller

UMC

Unassigned Multiplexer Code

V

VC

Virtual Circuit

Z

ZBTSI

Zero Byte Time Slot Interchange

ZCS

Zero Code Suppression

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DACS II
Release 8.0 PDS
2.048-Mb/s Interface
Operation and Maintenance Manual

Volume II - Trouble Clearing

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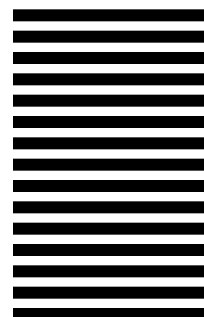
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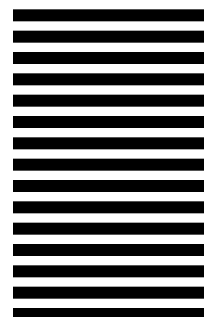
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About This Document

Purpose

This document provides procedural information required to support the craft personnel activities involved in the daily operation and maintenance of the DACS II (Digital Access and Cross-Connect System II). It also includes an overview that describes the physical and functional attributes of the DACS II. This volume contains the procedures to isolate and clear troubles.

Intended Audiences

This document is for individuals who are responsible for the acceptance, provisioning, operation, and maintenance of the DACS II system, Release 8.0.

How to Use This Document

Before you attempt to use the procedures in this document you should become familiar with its contents. The contents are described below.

The document is divided into two volumes:

- Volume I - Operation and Maintenance and Reference Information
- Volume II - Trouble Clearing

With the exception of the reference information contained in Volume I, each of the volumes stands on its own. The reference information applies to both volumes.

There are three ways to access the information in this document:

- The index in the back of each volume
- The tabs and the table of contents in the front of each tab
- The overall table of contents in the front of each volume.

Before you use the procedures in this document, you should have completed the DACS II Operation and Maintenance course (TR3521). If you were not able to take the training course, you should carefully study the information in Chapter 1 and the *Command Denials* section (found in each volume).

The procedures are arranged to be performed in the sequence in which they are presented. If you perform a procedure out of sequence, you may have trouble performing that procedure and the subsequent procedures.

Always start the trouble-clearing process by performing the procedures in Chapter 1 *Trouble Identification* of Volume II. The sections in Volume II are functional groupings of troubles. It is not always obvious from the message or alarm which of the trouble sections provides the procedure or procedures for clearing the trouble. If you begin with Chapter 1, you will be directed from procedure to procedure until the trouble is cleared.

Contents

Volume I

■ Chapter 1 - Introduction

This chapter provides an overview of the DACS II. It describes the DACS II hardware arrangements, functional operation, and command and message set. This chapter contains reference information required to operate and maintain the DACS II.

■ Chapter 2 - Acceptance

This chapter contains all the procedures required to accept a DACS II frame after it has been installed.

■ Chapter 3 - Provisioning

This chapter provides the procedures to install circuit packs and to grow and enable the common equipment (frame, synchronizer, and cross-connect network) and Units (FTU, DS3U, HDS3U, and DSPU).

Included are the procedures to install circuit packs and to grow and enable the NPCs (FTU with or without *SLC*® Carrier, DS3U, HDS3U, and DSPU, Subrate, or DMB).

Also included are the procedures to make the DSX connections and perform tests to establish DS1 facilities with or without *SLC* Carrier, DS3 and Hybrid DS3 facilities, and Subrate channels.

■ Chapter 4 - Test Access

This chapter contains the procedures to establish the test ports, make the DS0 and Clear-DS1 test connections, and establish and test-subrate channels.

■ Chapter 5 - Remove and Degrow Equipment

This chapter contains the procedures to remove and degrow NPCs, units, and cross-connect networks.

■ **Chapter 6 - Cross-Connections and Disconnections**

This chapter contains the procedures to make DS0, Clear-E1, Channelized-E1, Nx64 and Subrate cross-connections and to disconnect the cross-connections.

■ **Chapter 7 - Administration**

This chapter contains the procedures to log on or log off the DACS II; create, change, and delete alternate maps; and create, activate, and delete macros.

■ **Chapter 8 - Maintenance**

This chapter contains the procedures for routine PMEM and SMEM memory card maintenance, PMEM and SMEM card removal, and plug-in removal and replacement.

■ **Chapter 9 - Performance Monitoring**

The procedures in this chapter tell you how to schedule and retrieve reports that monitor various DS1 performance parameters.

■ **Chapter 10 - C-Bit Processing**

This chapter contains the procedures to connect/disconnect facility channels to C-bit processor and to select C-bit processing functions.

■ **Chapter 11 - Command Denials**

This chapter lists the command denial codes and their meanings. This information is useful in determining problems with the DACS II. You should be familiar with the contents of this chapter before you attempt any of the other procedures.

Volume II

■ Chapter 1 - Trouble Identification

This chapter contains the procedures for interpreting the alarms and messages that identify troubles. ***All trouble clearing starts here. You are directed from here to a procedure in one of the following chapters. That procedure may direct you to a procedure in a chapter that follows it. The process continues until you isolate the fault.***

■ Chapter 2 - Power Failures

This chapter contains the procedures for isolating power troubles.

■ Chapter 3 - Facility Alarms

This chapter contains the procedures for isolating troubles in the facilities that connect to DACS II.

■ Chapter 4 - Hardware Failures

This chapter contains procedures for locating internal DACS II troubles. The messages associated with these troubles usually identify one or more possible faulty plug-ins.

■ Chapter 5 - Manual Diagnostic Failures

This chapter contains the procedures for clearing troubles identified when you run manual diagnostics.

■ Chapter 6 - Controller and Link Troubles

The procedures in this chapter are used to isolate troubles in the controller or the link connecting the controller to a terminal or operating system. These troubles are usually associated with a reset.

■ Chapter 7 - Data Base Troubles

The procedures in this chapter are used to isolate a conditional reset or back-up memory trouble.

■ Chapter 8 - Frame Audits

The procedures in this chapter are used to isolate faults detected when frame audits are run.

■ Chapter 9 - Software Error

The procedures in this chapter are used to isolate troubles indicated by a software trouble message.

■ Chapter 10 - TS0 and C-Bit Messages

The procedures in this chapter tell you how to respond to messages that indicate changes in the status of TS0 or C-bit register or an overflow in the TS0 or C-bit buffers.

■ **Chapter 11 - Command Denials**

This chapter lists the command denial codes and their meanings. This information is useful in determining problems with the DACS II.

Conventions Used

This manual uses special fonts in order for the user to differentiate computer input/output. The constant width font indicates message formats, keywords, letter representations of parameters, parameter values, and messages as they would appear on a DACS II terminal screen.

Related Documentation

The following documents support the DACS II system:

- DACS II Release 8.0 Installation Manual:

- IPH903 (DACS II CEF)
- IPH903I (DACS II ESBF)

Audience: Customers planning to install the equipment

Content: Customer installation instructions.

- DACS II Release 8.0 Product Description Manuals:

- 365-353-120 (24 Channel)
- 365-353-140 (30 Channel)

Audience: Network planners, engineers, and others that need to know how the DACS II works and fits into the network

Content: Features, applications, and description and other reference information.

- DACS II Release 8.0 Operation and Maintenance Manuals:

- 365-353-121 (PDS)
- 365-353-131 (MML)
- 365-353-141 (PDS 2.048-Mb/s Interface)
- 365-353-151 (MML 2.048-Mb/s Interface)

Audience: End-user maintenance personnel

Contents: Procedures to operate and maintain the DACS II.

■ DACS II Release 8.0 Command and Message Manuals:

- 365-353-122 (PDS)
- 365-353-132 (MML)
- 365-353-142 (PDS 2.048-Mb/s Interface)
- 365-353-152 (MML 2.048-Mb/s Interface).

Audience: End-user maintenance personnel

Content: Description of each software input message and its response along with a description of each system output report.

■ DACS II Release 8.0 Quick Reference Guides:

- 365-353-123 (PDS)
- 365-353-133 (MML)
- 365-353-143 (PDS 2.048-Mb/s)
- 365-353-153 (MML 2.048-Mb/s)

Audience: End-user maintenance personnel

Content: Abbreviated list of system commands and parameters.

■ DACS II Release 8.0, Software Release Description:

- Com. Code CC108164492

Audience: End-user maintenance personnel

Content: Upgrade procedures for the new software release, status of problems fixed in previous releases, and operating issues for the specified software release.

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Trouble Identification

1

Contents

Select Trouble-Clearing Procedure	1-1
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Select Trouble-Clearing Procedure

This chapter offers three paths for finding the appropriate trouble-clearing information in this volume. The path you take depends on the amount of trouble isolation that is needed to identify the trouble.

- If you are looking for a procedure to direct you through the evaluation of troubles in the trouble printout, refer to Section 1.2, *Isolate Frame Trouble*.



NOTE:

If you are not sure which message in the trouble report to respond to first, use Section 1.2 to identify the troubles.

- If you are looking for a summary of trouble types and indications so that you can isolate the trouble yourself, refer to Table 1-1 to find the appropriate chapter in this volume. This path would be used if you have some experience with the DACS II and you know the priority of handling multiple trouble messages.
- If you are looking for a direct reference to the procedure to clear a particular trouble message, refer to Table 1-3 at the end of Section 1.2 to find the appropriate section of this volume. This path would be used if you have a single trouble or you have already isolated the trouble.

Table 1-1. Trouble Summary and Chapter References

Trouble Indication/ Trouble Messages	Consequence Action	Trouble Cause	Trouble Section
Fuse bead extended (48V fuse & alarm panel) LED lighted on fuse board ERR PWR COMPL	Plug-ins removed from service	Blown fuse: (1) Aged fuse failed, (2) Shorted backplane or plug-in.	2.1
AR01 MISC ALM PMA PBA COMPL	Major alarm: backup supplies the load Critical alarm: plug-ins removed from service	(1) Power unit failed, (2) Short on load	2.2
ALM {DMA PMA} <parameter> NPC COMPL	Service interruption; trunk conditioning	(1) Failed 2-Mb/s line, (2) Transmit/receive plug-in	3.3 3.4
ALM {15ME 24HR} <parameter> NPC COMPL	Service interruption (DMA alarm); trunk conditioning	(1) Line degradation, (2) Transmit-end equipment	3.5
ALM {15ME 24HR} <parameter> NPC COMPL	Transmission impaired	(1) Line degradation, (2) Transmit equipment	3.4
ERR ESR <entity> COMPL ERR ESR ANALYSIS REPORT RMV <entity> COMPL	Plug-in service removed; service switched to other side or protection	(1) Failed plug-in, (2) Wiring problem	4.2,4.3
ERR <entity> COMPL RMV <entity> DNY	Critical alarm: service interruption	(1) Multiple plug-ins failed.	4.3
ALM ECCN OOS COMPL	Side failed; no duplex switching	Failed plug-in	4.1
UTL::QRY,ALMS! (input)	Frame alarm	Power failed, plug-in failed, CCN/ECCN plug-in removed, etc.	1.2
DGN <entity> STF COMPL	Diagnostic failed; Restore command denied	Failed plug-in	5.0
FAILURE lighted on status panel	Frame controller inoperative or in MCOND	(1) Reset needed, (2) Failed plug-in	6.1

Continued on next page

Table 1-1. Continued

Trouble Indication/ Trouble Messages	Consequence Action	Trouble Cause	Trouble Section
RESET STOPPED	Frame controller inoperative	(1) Incorrect MC plug-in code, (2) failed plug-in	6.2
BOOT FAILED - BAD BOOT DEVICE	Frame controller inoperative	(1) Incorrect MC plug-in code, (2) Failed plug-in	6.4
Inoperative terminal (Frame Hung)	Can't enter commands	(1) Terminal setup, (2) Incorrect link provisioning, (3) Failed CI plug-in, (4) Link adapter or connections.	6.6
OVERLOAD {MP CI}	Frame controller can't process commands; reset operated.	(1) Failed controller plug-in	6.5
OVERLOAD UNIT qq UC	Unit controller can't process commands; UC restored.	(1) Failed controller plug-in	6.5
BMTR ...DNY ALM MN SMEM COMPL	Backup transfer failed; SMEM will not be current	(1) SMEM problem, (2) Frame controller trouble	7.1
RESET COND cc COMPL	Frame controller inoperative or in MCOND	(1) Can't access PMEM/SMEM, (2) Failed plug-in	7.2
FRADTS FRCMP	Frame audit messages	Equipage/provisioning disagreement in memories.	8.1
FRADTS DGN	Plug-in removed from service	Failed plug-in	8.2
FRADTS BMCMP	Frame audit messages	Disagreement in RAM and PMEM	8.3
ERR MSGS TO LOG DISCARDED	Transient errors being recorded	Errors detected at plug-in	4.6
ERR HARDWARE	Plug-in removed from service or identified for maintenance	Error detected at plug-in	4.8
ERR SOFTWARE	Command aborted; autonomous maintenance action		9.1

Isolate Frame Trouble

1. If alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Check for blown fuses (see Note). If whole units of packs have failed, check the fuse and alarm panel for lighted **FA** lamp and a blown 48-volt feeder fuse. In the unit and other circuit groups, check for lighted LED indicator on or above fuse boards.

⇒ NOTE:

Depending on the type of fuse, a blown fuse is indicated by one of the following: (1) extended color bead on indicator fuse, (2) lighted LED on LED-fuse, or (3) lighted LED for group of fuses on fuse block.

- If there is a blown fuse at the frame, go to Section 2.1 to clear blown fuse trouble.
3. Check printout for ERR PWR message.
 - If ERR PWR message occurs in printout, go to Section 2.2 to clear power unit failure.
 4. Enter **UTL : :QRY,ALMS!** for an alarm summary and use the following to interpret the output:
 - The frame and power alarm summaries occur early in the printout. The left-to-right assignment for the PWR line is: 1-6 for peripheral units, 7 and 8 for sync sides 0 and 1, 9 and 10 for CCN/ECCN sides 0 and 1, and 11-20 for other peripheral units.
 - Pack alarms are indicated by an "a" (for auto removal) or M (for major) in the message where the pack is listed. Unequipped packs are shown by dashes.
 - Alarms on 2.048-Mb/s terminations are indicated by an M (major), * (minor), I (INFO for type PB/PC NPC), or dash (no alarm) for the NPC.
 - Figure 1-1 shows how to read the common equipment line in the output. Alarms are indicated by M (for major).
 - If the DACS II does not execute the command, refer to Step 16.

M...UTL QRY ALMS a b c d e f g h i j k l m n o p q r s EOM

a = MC (Main Controller)
 b = MP (Main Processor)
 c = CI (Communications Interface)
 d = SSC (Secondary Storage Controller)
 e = PMEM
 f = SMEM
 g = Link 1
 h = Link 2
 i = Link 3
 j = Link 4
 k = Link 5
 l = Link 6
 m = Cross-connect Side 0
 n = Cross-connect Side 1
 o = CCI 0 / CCNI 0
 p = CCI 1 / CCNI 1
 q = TOD Reset
 r = DATE Reset
 s = SMEM OOS

Figure 1-1. Common Equipment Alarms

5. Check printout for any of the messages in Table 1-2.
 - If you have any of the messages in Table 1-2, go to the reference listed for the message.

Table 1-2. Facility Alarm Messages

Message Keywords	Reference
AR01 MISC ALM MJ PBA (2.048 Mb/s line)	Section 3.1
ALM {MJ/MN} <parameter> NPC <npc No.>	Section 3.2
ALM {15ME/24HR} <parameter> NPC <npc No.>	Section 3.2
AR01 MISC ALM IDID CGA <npc No.>	Section 1.3

6. Check the printout for an ERR ESR ANALYSIS REPORT message. See Figure 1-2 for the typical sequence of messages.
 - If you have the ERR ESR ANALYSIS REPORT message, go to Section 4.2 to clear that message.

```
ERR ESR <entity> COMPL

ERR ESR ANALYSIS REPORT EVENT eeee X LN MSG:
<suspect plug-in No.1>
<suspect plug-in No.2>
<suspect plug-in No.3>
<suspect plug-in No.4> COMPL

RMV <entity> COMPL

DGN <entity> STF ppqq COMPL
```

Figure 1-2. Error Analysis Report

7. Check the printout for RMV <entity> COMPL and DGN <entity> COMPL sequence of messages.
 - If you have the RMV and DGN sequence of messages, go to Section 4.3 to clear the ERR <entity> message.
8. Enter **UTL::QRY,ALL[,UNIT [q]q]!** for the whole frame or unit (of the frame) and check output for failed and out-of-service plug-ins and compare results with the ALMs query entered previously.

⇒ NOTE:
Out-of-service, failed, and pested plug-ins are indicated by the presence of a "1" in the respective columns (out-of-service, failed, pested) of the output for each plug-in; unequipped NPCs are indicated by dashes.
9. If any circuits have failed status (shown in previous queries), Diagnose them with the DGN command. If they still have failed status, enter RMV command for plug-in, replace it, and enter RST command per Figure 1-3.
10. If any circuits are out-of-service but not failed, enter the RST command per Figure 1-3.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSI,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 1-3. Maintenance Command Construction

11. Check printout for any messages that start with an A (for autonomous) or I (information) prefix.
 - If you have an ERR LINK ...STATUS message, check if the terminal has been disconnected from any link (first data byte after word STATUS will be 00 or 01 if this is the case).
 - If you have any of the autonomous messages, refer to Table 1-3 for trouble procedure reference.
 - If the alarm has cleared, the trouble was either intermittent or the preceding activity cleared the alarm condition. The status panel alarm will clear and an IDLD message will be issued in most cases.
12. If the alarm is still present, reenter the following commands:

UTL : : QRY, ALMS !

UTL : : QRY, ALL [, UNIT [q]q] [, COMMON] !

 - If any CPs have failed status, enter the RMV command, replace the plug-in, and enter the RST command per Figure 1-3.
13. To make a record of the error history on the PMEM (for use by technical consultant), enter one of the following commands (see Note):

Time of Day/Time Interval:

UTL : : QRY, ERR, HWER, {INT mn | [DATE mddyy,] TOD hhmmss} !

Suspect Entity:

UTL : : QRY, ERR, HWER, ENTY eee !

Where:

INT = Interval of time (past 59 minutes)

TOD = Time of day consisting of hour (hh=00 through 23), minutes (mm=00 through 60), seconds (ss=00 through 60). Date (month, day, year) is optional.

eee = Plug-in designation, for example: BX, CCB, CCI, CCNI, FC, FTMI, LINK, MC, MP, MTC, NPC, SYNC, SMEM, TLI, TSI, UBX, UC.

 NOTE:

If you do not know how full the error log is (not recently cleared), you will want to use a short interval, perhaps the past 5 minutes, to avoid overloading the link with old errors.

- If you do have trouble messages (from printout or error log) to work with, refer to Table 1-3 to clear the trouble.

 NOTE:

Steps **14** and **15** deal with an MC problem causing false alarms to be reported. To avoid unnecessary plug-in replacements in the MC, it is important to be sure there are no other trouble messages.

14. Replace the EMTC or MTC plug-in in the MC.
15. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If the alarm clears, this procedure is completed.
 - If the alarm does not clear, there is an obscure trouble; contact technical consultant.

(Continue Here If DACS II Is Not Responding to Commands)

16. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If STARTUP ...STF message is received, go to Section 6 to clear reset stopped (startup diagnostic failed).
 - If the DACS II is now executing commands, this procedure is completed.
 - If the DACS II is still not executing commands, continue with Step **17**.

17. At the back of the frame, disconnect the administrative link cables (except link 1) from the main controller and tag them for correct installation after the trouble is cleared.
18. Replace the appropriate pack as follows:
 - For RL response, replace the CPU2 in the main controller.
 - For no response (no character echo), replace the HECI in the main controller.
19. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND code) message is received, this procedure is completed. Reconnect the administrative links.
 - If conditional completion is received, go to Section 7.2 to clear reset conditional completion.

Table 1-3. Autonomous Messages

Autonomous Message	Reference
ALM IDLD <parameter> NPC <npc No.> COMPL <parameter> = BER, SLIP, or other facility error	Section 1.3
ALM IDLD ECCN s OOS COMPL	Section 1.3
ALM MJ ECCN s OOS COMPL	Section 4.1
ALM MN SMEM COMPL	Section 7.1
ALM RESET {DATE/TOD/TOD DATE} ...COMPL	Section 6.3
ALM [LOS/LEN/EXJ/PHS/OOF/MAJ/MIN] CLR ...COND Eccc COMPL	Section 1.3
ALM [LOS/LEN/EXJ/PHS/OOF/MAJ/MIN] SET ...COND Eccc COMPL	Section 4.3
ALM {15ME/24HR} <parameter> NPC <npc No.> COMPL	Section 3.2
ALM {MJ/MN} <parameter> NPC <npc No.> COMPL <parameter> = BER, SLIP, or other facility error	Section 3.2
AR01 MISC ALM IDLD PBA <npc No.> {A/B/E/I/L/M/R/S/V/X/Y} COMPL	Section 1.3
AR01 MISC ALM {PMA/DMA/MI} PBA <npc No.> <alarm type > COMPL	Section 3.1
AUD QRY BER ALL NPC S TOT xxxx COMPL	Section 3.5
{BADVERB/FRMERR/SEQERR} BAD SYNTAX ...STOPPED	Section 11.1
BMTR ...DNY	Section 7.1
BOOT FAILED - BAD BOOT DEVICE	Section 6.4
HECI RESET	Section 1.4
HECI STARTUP STF	Section 6.2
CMD MC {OOS/MCOND/INSERVICE/MPDBASE} ...STOPPED	Section 11.1
C BIT BUFFER OVERFLOW	Section 10.3
DGN <entity> IN PROGRESS	Section 1.4
DGN CCB sq STF ppqq COMPL	Section 5.21
DGN CCI s STF ppqq COMPL	Section 5.13
DGN CCNI STF ppqq COMPL	Section 5.13
DGN HECI STF ppqq COMPL	Section 5.3
DGN PMEM STF ppqq COMPL	Section 5.4
DGN ETSI sqq STF ppqq COMPL	Section 5.14
DGN LINK a STF ppqq COMPL	Section 5.18
DGN MC STF ppqq COMPL	Section 5.1
DGN MP STF ppqq COMPL	Section 5.2
DGN SYNC STF ppqq COMPL	Section 5.5

Continued on next page

Table 1-3. Continued

Autonomous Message	Reference
DGN SYNC a,TLI m STF ppqq COMPL	Section 5.7
DGN SYNC,TLI 3,CRO STF ppqq COMPL	Section 5.6
DGN TSI STF ppqq COMPL	Section 5.13
DGN SMEM STF ppqq COMPL	Section 5.16
DGN UNIT qq,DSPI STF ppqq COMPL	Section 5.10
DGN UNIT qq,FC sb STF ppqq COMPL	Section 5.11
DGN UNIT qq,FTMI d STF ppqq COMPL	Section 5.9
DGN UNIT qq,UC STF ppqq COMPL	Section 5.8
EBX STARTUP STF	Section 6.2
EMTC STARTUP STF	Section 6.2
ERR ANALYSIS REPORT ...COMPL	Section 4.2
ERR CMD ABT ...STOPPED	Section 11.1
ERR ESR CCI s TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR ETSI sqq TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR LINK a TN dddd STATUS a0 a1 a2 COMPL	Section 4.3
ERR ESR MC HECI TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR MC EBX TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR MC EMTC TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR MC MP TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR MC SSC TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR NPC <npc No.>[-<range>] SIDE s TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR NPC <npc No.>[-<range>] TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR SYNC a TLI m SSP b TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR SYNC a TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR UNIT qq DSPI TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR UNIT qq FC sb TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR UNIT qq FLI k TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR UNIT qq FMT s TN dddd EVENT eeee ...COMPL	Section 4.3

Continued on next page

Table 1-3. Continued

Autonomous Message	Reference
ERR ESR UNIT qq FTMI b TN dddd EVENT eeee ...COMPL	Section 4.3
ERR ESR UNIT qq {UC/UBX} TN dddd EVENT eeee ...COMPL	Section 4.3
ERR HARDWARE COMPL	Section 4.8
ERR MSGS TO LOG DISCARDED COMPL	Section 4.6
ERR PWR ...COMPL	Section 2.2
ERR SOFTWARE ...COMPL	Section 9.1
ERR SYNC a MODE {FAST/HOLDOVER/NORMAL} ...COND	Section 4.3
Eccc COMPL	
ERR SYNC a TLI m SSP b [NPC <npc No.>]	Section 4.3
FRADTS <nnppqq> CYCLE STARTED	Section 1.4
FRADTS BMCMP ...COMPL	Section 8.3
FRADTS DGN ...COMPL	Section 8.2
FRADTS FRCMP ...COMPL	Section 8.1
FRADTS MC DGN tttt COMPL	Section 8.2
MC RESET ...COND cc COMPL	Section 7.2
RMV <entity> COMPL	Section 4.5
MP STARTUP STF	Section 6.2
MTC STARTUP STF	Section 6.2
OVERLOAD {MP/HECI/UNIT qq UC} ...COMPL	Section 6.5
RESET {DATE/TOD/TOD DATE} ...COMPL	Section 6.3
RESET STOPPED	Section 6.2
RL (After Each Entry)	Section 6.7
TS0 R NPC OLD ,NEW ...COMPL	Section 10.1
TS0MBOFL <npc No.> COMPL	Section 10.2
UTL RCY <entity> <action> COND cc COMPL	Section 1.4
UTL RCY <entity> <action> COND cc DNY	Section 9.1
UTL RCY IN PROGRESS	Section 1.4

Check ALM IDLD or INFO Message

Overview: This procedure deals with alarm IDLD (idled) and INFO (information) messages. Facility alarm idled messages are received after the line signal is restored on a facility that previously had a PBA (primary block alarm). Alarm information messages are received on 2.048-Mb/s lines when an alarm condition designated as maintenance information occurs. Alarm idled messages do not occur after maintenance information alarms due to facility error (for example, for SLIP or BER) are cleared. The error counts for these parameters are checked and the counts are cleared using utility commands.

1. Which one of the following keywords appears in the message?
 - If **IDLD**, continue with Step 2.
 - If **INFO**, proceed to Step 4.
2. This message reports that an alarm has cleared. For facility alarms, the NPC and the type of alarm are given in the message; for example, PBA (primary block alarm) and facility parameter BER (bit error rate).
3. If the message is the PBA type, you can relate the IDLD message to the alarm onset message by the NPC number. Table 1-4 gives the meanings of the alarm types that appear in the alarm onset message for reference.
4. If the message is for a timing link failure (ERR SYNC messages), refer to Table 1-5 for the meaning of the alarm type.

Table 1-4. Keyword Meanings

Alarm Keyword	Meaning
AIS	Alarm indication signal (DS3)
BER	Bit error rate high (DS3)
LOS	Loss of signal
LEN	Loss of energy
EXJ	Excessive jitter
PHS	Phase shift
OOF	Out of frame
PMA	Prompt maintenance alarm
DMA	Deferred maintenance alarm

Table 1-5. PBA Alarm Types

Indicator	Meaning
A	All 1s signal (AIS) received from far end.
B	Incoming high bit error rate (BER).
C	Loss of CRC4 multiframe alignment in TS0 (LCMA). [Note 3]
E	Excessive errors received at far end (REER).
F	Loss of frame (LOF). [Note 3]
G	Far-end loss of CRC4 multiframe alignment in TS0 (FLCMA).
I	Remote all 1s indication (RAIS).
L	Loss of multiframe alignment (LMA). [Note 1]
M	Remote loss of alignment sent on TS16 (R16). [Note 1]
P	TS0 pseudo-frame word out-of-frame (PFWOOF).
R	Loss of signal primary block failure (LOS PBF); loss of frame primary block failure (LOF PBF). [Note 2]
S	Far end sync has gone into holdover (Sync Fail Indication).
V	All 1s indication on TS16 (A16). [Note 1]
X	Incoming excessive error rate (EER).
Y	Remote alarm indication (RAI).

Note 1: These only occur with CAS line format.

Note 2: R can be either LOF PBF or LOS PBF for PB/PC NPCs;
but R is LOS PBF for PA NPCs.

Note 3: PA type NPCs only.

5. An "A" after the PBA word and NPC number reports the receipt of an AIS (alarm indication signal, all 1s, blue signal) from the far end.



NOTE:

AIS alarms may be programmed to deferred maintenance alarm (DMA), prompt maintenance alarm (PMA), or information (MI) levels.

Check Autonomous Action or Command In-Progress Messages



NOTE:

Action messages indicate that some action has been initiated; frequently, an autonomous action brought by a trouble condition. In-progress messages are issued every 20 seconds while commands with longer execution times are underway. Other commands will be ignored while a command is in-progress.

1. See Table 1-6 for an explanation of the message. The message may not require any action, but associated messages may require action. Messages that do not require action are: ACO ACTIVE and CI/ECI/HECI RESET.

Table 1-6. Message Explanations

Message Keywords	Explanation
DGN <entity> IN PROGRESS	Autonomous or manually requested diagnostic is being run.
RMV <entity> IN PROGRESS	Autonomous or manually requested remove from service is being executed; this operation takes up to 3 minutes for the tape drive.
UTL <verb> IN PROGRESS	Autonomous or manually requested utility command is being executed.
ACO ACTIVE	Alarm cutoff has been activated using the status panel control.
FRADTS CYCLE STARTED	Frame audit routine was autonomously initiated to compare values stored in different memory locations.
UTL RCY IN PROGRESS	Autonomous trouble recovery action is being executed.
HECI RESET	Notification to operations systems on links that main controller has been reset.

2. Which type message do you have?
 - If FRADTS ...STARTED, continue with Step 3.
 - If DGN, RMV, or UTL ...IN PROGRESS, proceed to Step 4.
 - If UTL RCY ...IN PROGRESS, proceed to Step 5.
3. When resulting frame audit messages are received, refer to the appropriate trouble-clearing procedure as follows:
 - If FRADTS FRCMP, refer to Section 8.1.
 - If FRADTS DGN, refer to Section 8.2.
 - If FRADTS BMCMP, refer to Section 8.3.
4. If the IN PROGRESS message was received in response to entry of a manual command, wait to see if command completion is received after 20 seconds. See Note.
 - If command completion message is received after 20 minutes, this procedure is completed.

**NOTE:**

Operations may be delayed because higher priority commands are being processed. Some commands take longer to complete.

5. If IN PROGRESS messages are still being received after an hour, hold the **RESET ENABLE** switch on and press the **RESET** button on the DACS II status panel.
 - If the trouble persists, contact technical consultant.

**NOTE:**

At this point the system is "hung" and the only way to establish communication with the frame is by performing the RESET mentioned above. However, you may run the risk of a service interruption by performing this RESET.

6. Check the printout for ERR ESR MC messages and other trouble messages and check if the **FAILURE** LED is lighted on the status panel. Also enter the following commands: **UTL : :QRY,ALMS!** and **UTL : :QRY,ALL!** and refer to the appropriate part (listed in order of importance) as follows:
 - If ERR ESR message, go to Section 4.3.
 - If FAILURE lighted on status panel, go to Section 6.1.
 - If retry later (RL) responses, go to Section 6.7.
 - If ERR SOFTWARE message, go to Section 9.1.
 - If frame alarm, go to Section 1.2.
 - If failed or out-of-service plug-ins, go to Section 4.5.
 - If other trouble message, find the message in Table 1-3 at the end of Section 1.2 and go to that reference.

Power Failures

2

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This chapter contains the procedures to clear power troubles due to a blown fuse, a failed power unit, or the loss of 48-volt input power.

- **Blown Fuses.** There is no backup power for a blown fuse. However, fusing is designed so that a single failure will only affect one side of any duplicated network and a minimum of plug-ins. The indications of a blown fuse are the lighted indicator on the panel or fuse board and the output messages indicating that groups of plug-ins have failed.
- **Power Unit Failure.** The failure of a power converter is indicated by the lighted failure LED on the plug-in and by the receipt of the ERR PWR message. The failure of a single power unit does not cause a loss of service, because a redundant power unit is always provided to supply the load. A single power unit failure causes a major alarm to draw immediate attention; more than one failure in a power unit group causes a critical alarm and the loss of service.
- **Loss of Input Battery.** The arrangement of the four input power feeders is as follows: feeders A and B supply side 0 circuit groups, and feeders C and D supply side 1 circuit groups. This arrangement prevents the loss of service if one feeder fails. The procedure to recover from loss of all input power is to reset the frame controller after the power is connected. This will cause the MC and sync packs to be reset and restored. Cross-connect network and peripheral unit plug-ins must be restored using manual input commands.

⇒ **NOTE:**

If you already have isolated the trouble to powering, you can go directly to the procedure for that trouble; otherwise, go to *Trouble Identification* to first isolate the trouble.

Clear Blown Fuse Trouble

1. Locate blown fuse by lighted LED fuse or extended fuse bead. An **FAL** indicator on the fuse and alarm panel will be lighted for a 48-volt fuse. The fuse and alarm panel is at the bottom of the multibay frame and at the top of single-bay frame.
2. Replace blown fuse. For LED-type fuses, use extractor or long-nose pliers. If separate 1/2 A indicator fuses are provided, replace the higher amperage fuses before the indicator fuses.

**CAUTION:**

Using a replacement fuse of higher amperage rating can cause equipment damage.

**NOTE:**

The color of the bead indicator fuses denotes the amperage. Red is for 1/2 A (70G), orange is for 2A (70B), and green with black stripe is for 5A (70D) fuse.

**NOTE:**

On older fuse panels, which do not use a 5A indicator fuse for positions A5-1, A6-1, B5-1, B6-1, etc., the fuses for those positions are 1/2 A indicator fuses and the associated 7.5A fuses.

- If the fuse holds, proceed to Step **13**.
 - If the fuse does not hold, continue with Step **3**.
3. If the blown fuse is on the 48-volt fuse and alarm panel, continue with Step **4**.
 - If the blown fuse is not on that panel, proceed to Step **7**.
 4. Replace associated power unit or CP (circuit pack) listed in the appropriate table:
 - Table 2-1 for the CEF
 - Table 2-2 for the non-CEF multibay frame
 - Table 2-3 for the single-bay frame.
 5. Replace fuses.

Table 2-1. 48-Volt Power (for CEF)

Feed A Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
A1	411A,SM566, 424AA, or 563A	Unit 1	70D,5A	Green
A2	411A,SM566, 424AA, or 563A	Unit 2	70D,5A	Green
A3	411A,SM566, 424AA, or 563A	Unit 3	70D,5A	Green
A4	411A,SM566, 424AA, or 563A	Unit 4	70D,5A	Green
A5-1	Indicator for A5-2	-	70G,0.5A	Red
A5-2	CCI,ETSIIs	ECCN 0	74J,7.5A	-
A6-1	-	-	-	-
A6-2	-	-	-	-
A7	411AA,SM566, 424AA, or 563A	Unit 5	70D,5A	Green
A8	TG58	0SPU (SYNC 0)	70D,5A	Green
A9	411AA,SM566, 424AA, or 563A	Unit 6	70D,5A	Green
A12	411AA,SM566, 424AA, or 563A	Unit 7 (0PU)	70D,5A	Green
A13	411AA,SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
A14	411AA,SM566, 424AA, or 563A	Unit 10	70D,5A	Green
A15	411AA,SM566, 424AA, or 563A	Unit 11 (0PU)	70D,5A	Green
A16	411AA,SM566, 424AA, or 563A	Unit 13 (0PU)	70D,5A	Green
A17	411AA,SM566, 424AA, or 563A	Unit 14 (0PU)	70D,5A	Green
A18	411AA,SM566, 424AA, or 563A	Unit 15	70D,5A	Green
A19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-1. Continued

Feed B Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
B1	411A,SM566, 424AA, or 563A	Unit 1	70D,5A	Green
B2	411A,SM566, 424AA, or 563A	Unit 2	70D,5A	Green
B3	411A,SM566, 424AA, or 563A	Unit 3	70D,5A	Green
B4	411A,SM566, 424AA, or 563A	Unit 4	70D,5A	Green
B5-1	-	-	-	-
B5-2	-	-	-	-
B6-1	-	-	-	-
B6-2	-	-	-	-
B7	411AA,SM566, 424AA, or 563A	Unit 5	70D,5A	Green
B8	-	CRO	70D,5A	Green
B9	411AA,SM566, 424AA, or 563A	Unit 6	70D,5A	Green
B12	411AA,SM566, 424AA, or 563A	Unit 7	70D,5A	Green
B13	411AA,SM566, 424AA, or 563A	Unit 9 (0PU)	70D,5A	Green
B14	411AA,SM566, 424AA, or 563A	Unit 10 (0PU)	70D,5A	Green
B15	411AA,SM566, 424AA, or 563A	Unit 11	70D,5A	Green
B16	411AA,SM566, 424AA, or 563A	Unit 12 (0PU)	70D,5A	Green
B17	411AA,SM566, 424AA, or 563A	Unit 14	70D,5A	Green
B18	411AA,SM566, 424AA, or 563A	Unit 15 (0PU)	70D,5A	Green
B19	411AA,SM566, 424AA, or 563A	Unit 16 (0PU)	70D,5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-1. Continued

Feed C Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
C1	411A,SM566, 424AA, or 563A	Unit 1 (1PU)	70D,5A	Green
C2	411A,SM566, 424AA, or 563A	Unit 2 (1PU)	70D,5A	Green
C3	411A,SM566, 424AA, or 563A	Unit 3 (1PU)	70D,5A	Green
C4	411A,SM566, 424AA, or 563A	Unit 4 (1PU)	70D,5A	Green
C5-1	Indicator for C5-2	-	70G,0.5A	Red
C5-2	CCI,ETSIIs	ECCN 1	74J,7.5A	-
C6-1	-	-	-	-
C6-2	-	-	-	-
C7	411AA,SM566, 424AA, or 563A	Unit 5	70D,5A	Green
C8	TG58	1SPU (SYNC 1)	70D,5A	Green
C9	411AA,SM566, 424AA, or 563A	Unit 6 (1PU)	70D,5A	Green
C12	411AA,SM566, 424AA, or 563A	Unit 7 (1PU)	70D,5A	Green
C13	411AA,SM566, 424AA, or 563A	Unit 8 (1PU)	70D,5A	Green
C14	411AA,SM566, 424AA, or 563A	Unit 9	70D,5A	Green
C15	411AA,SM566, 424AA, or 563A	Unit 11 (1PU)	70D,5A	Green
C16	411AA,SM566, 424AA, or 563A	Unit 12	70D,5A	Green
C17	411AA,SM566, 424AA, or 563A	Unit 13 (1PU)	70D,5A	Green
C18	411AA,SM566, 424AA, or 563A	Unit 16	70D,5A	Green
C19	-	-	-	-

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-1. Continued

Feed D Fuse	Power Unit/CP			
	Type (Note)	Assignment	Size	Bead Color
D1	-	-	-	-
D2	-	-	-	-
D3	-	-	-	-
D4	-	-	-	-
D5-1	-	-	-	-
D5-2	-	-	-	-
D6-1	-	-	-	-
D6-2	-	-	-	-
D7	411AA,424AA, or	+5 MC Power	70D,5A	Green
D9	SM565 (MCP)	MC Power	70B,2A	Orange
D10	-	MTC	70G,0.5A	Red
D12	411AA,SM566, 424AA, or 563A	Unit 8 (0PU)	70D,5A	Green
D13	411AA,SM566, 424AA, or 563A	Unit 9 (1PU)	70D,5A	Green
D14	411AA,SM566, 424AA, or 563A	Unit 10 (1PU)	70D,5A	Green
D15	411AA,SM566, 424AA, or 563A	Unit 12 (1PU)	70D,5A	Green
D16	411AA,SM566, 424AA, or 563A	Unit 13	70D,5A	Green
D17	411AA,SM566, 424AA, or 563A	Unit 14 (1PU)	70D,5A	Green
D18	411AA,SM566, 424AA, or 563A	Unit 15 (1PU)	70D,5A	Green
D19	411AA,SM566, 424AA, or 563A	Unit 16 (1PU)	70d,5A	Green

Note: The type depends on the type of unit (IFTU, DSPU, or HDS3U).

Table 2-2. Multibay Power (Non-CEF)

Fuse	Power Unit/CP			
	Type	Designation/ Location	Size	Bead Color
A1	411AA	128-012	70D,5A	Green
A2	411AA	128-108	70D,5A	Green
A3	411AA	328-012	70D,5A	Green
A4	411AA	328-108	70D,5A	Green
A5-1	485AB	PU1 (CCN0)	70D,5A	Green
A5-2	-	-	-	-
A6-1	485AB	PU2 (CCN 0)	70D,5A	Green
A6-2	-	-	-	-
A7	411AA	1PU (Unit 5)	70D,5A	Green
A8	TG58	0SPU (SYNC 0)	70D,5A	Green
A8	-	0TB	70D,5A	Green
A9	411AA	1 PU (UNIT 6)	70D,5A	Green
B1	411AA	128-024	70D,5A	Green
B2	411AA	128-124	70D,5A	Green
B3	411AA	328-024	70D,5A	Green
B4	411AA	328-124	70D,5A	Green
B5-1, B5-2	485AB	PU3 (CCN 0)	70D,5A	Green
B6-1, B6-2	485AB	PU4 (CCN 0)	70D,5A	Green
B7	411AA	0PU (UNIT 5)	70D,5A	Green
B8	TG58	1SPU (SYNC 1)	70D,5A	Green
B8	-	1TB	70D,5A	Green
B9	411AA	0PU (UNIT 6)	70D,5A	Green

Table 2-2. Continued

Fuse	Power Unit/CP			
	Type	Designation/ Location	Size	Bead Color
C1	411AA	128-048 (Unit 1)	70D,5A	Green
C2	411AA	128-148 (Unit 2)	70D,5A	Green
C3	411AA*, 424AA, SM566, or 563A	328-048* (Unit 3)	70D,5A	Green
C4	411AA*, 424AA, SM566, or 563A	328-148* (Unit 4)	70D,5A	Green
C5-1	-	Indicator for C5-2	70G,,5A	Red
C5-2,	485AB	PU5 (1CCN)	70D,5A	Green
C6-1	-	Indicator for C6-2	70G,,5A	Red
C6-2,	485AB	PU6 (1CCN)	70D,5A	Green
C7	411AA	(Unit 5)	70D,5A	Green
C8	-	TLIs	70D,5A	Green
C9	SM566*, 424AA, 411AA, or 563A	DCP6* (Unit 6)	70D,5A	Green
D1	411AA	128-064 (Unit 1)	70D,5A	Green
D2	411AA	128-160 (Unit 2)	70D,5A	Green
D3	411AA*, 424AA, SM566, or 563A	328-064* (Unit 3)	70D,5A	Green
D4	411AA*, 424AA, SM566, or 563A	326-160* (Unit 4)	70D,5A	Green
D5-1	-	Indicator for D5-2	70G,,5A	Red
D5-2	485AB	PU7 (1CCN)	70D,5A	Green
D6-1	-	Indicator for D5-2	70G,,5A	Red
D6-2,	485AB	PU8 (1CCN)	70D,5A	Green
D7	411AA	226-148	70D,5A	Green
D8	-	226-160	70D,5A	Green
D9	411AA	226-136 (MCP)	70,2A	Orange
D10	-	MTC	70G,,5A	Red

Note: These are power units and locations for non-flex bay 3; An FTU in units 3 and 4, and a DSPU in unit 6.

Table 2-3. Single-Bay Power (Non-CEF)

Fuse	Power Unit	
	Type	Designation/Location
A1	411AA	FTU1-First PU
A2	TG58	0SPU (Sync Power)
A3	411AA	0PU (DSPU Side 0 Power)
A4	411AA	CCN2 Side 0 Power Unit
B1	411AA	FTU1-Second PU
B2	TG58	1SPU (Sync Power)
B3	411AA	1PU (DSPU Side 1 Power)
B4	411AA	CCN2 Side 1 Power Unit
C1	411AA	FTU1-Third PU
C2	NONE	48 Volts to TLIs 1-4, Both Sides
C3	SM566	DCP (DSPU Power)
D2	411AA	+5 Controller Power
D4	SM565	MCP (Main Controller Power)
D5	NONE	48 Volts to MTC Pack

6. If the fuse holds, verify that power unit output voltage is within limits (see Note 1) per Table 2-4 using a digital multimeter (such as KS-20599).

⇒ NOTE 1:

The FTU power units feed a common bus. To test the replacement for low voltage, one of the other units in the group must be temporarily disconnected.

- If output is out of limits, replace the power unit with one that meets requirements.
- If the fuse does not hold, refer to the appropriate schematic from the list below to locate the wiring trouble between feeder fuse and the power unit.
 - SD-96699-01 for CEF
 - SD-96658-01 for non-CEF multibay frame
 - SD-96684-01 for single-bay frame.

⇒ NOTE 2:

After the wiring trouble is corrected, you will have to use the commands of Figure 2-1 to restore all plug-ins that were removed from service (see trouble printout).

Table 2-4. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 -11.75 to -12.25	+V2 -V2	RTN RTN
411AA	+5.1 to +5.3	+	-
TG58	+4.75 to +5.25 -4.95 to -5.45	+	-
424AA	+5.0 to +5.5	+	-
485AB	+5.1 to +5.4	+	-
SM566	+4.75 to +5.25	+	-
563A	+4.9 to +5.3	5.5V	GRD

7. Refer to the appropriate table(s) that follows and the trouble printout to see the associated packs.
 - Table 2-5 for controller and sync fuses (CEF)
 - Table 2-6 for controller and sync fuses (non-CEF)
 - Table 2-7 for IFTU fuses
 - Table 2-8 for DSPU fuses (flexible bay)
 - Table 2-9 for DSPU fuses (original interface bay)
 - Table 2-10 for CCN fuses (original interface bay)
 - Table 2-11 for FTUs (original interface bay). See Note.

⇒ NOTE:

For LED-type fuses, the designation strips which have the right half offset up are read as follows: the lower left designation is for the bottom fuse on the fuse board, and the upper right one is for the top fuse (for example, CA at bottom and CH at top on ED-2C863-30, G1 dual fuse board).

8. Use RMV commands per Figure 2-1 to remove any affected packs from service that were not removed as part of error recovery (RMV ...COMPL in printout).
9. Disengage CPs associated with the blown fuse and replace fuse(s).

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSISs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 2-1. Maintenance Command Construction

10. If the fuse holds, continue with Step 11.

- If the fuse does not hold, refer to appropriate schematic listed below to clear wiring problem (see Note). After trouble is cleared, reinsert CPs; the packs affected by the power loss will also have to be restored to service per Figure 2-1.
 - SD-96699-01 for CEF
 - SD-96658-01 for non-CEF multibay frame
 - SD-96684-01 for single-bay frame.

⇒ **NOTE:**

You can use the coordinate location stamped over the plug-in position on the front panel to locate the slot wiring on the backplane.

11. Reinsert CPs one by one while watching fuse to find defective CP which blows fuse.
12. Replace CP that blows fuse and replace blown fuses.
13. Use RST commands per Figure 2-1 to restore affected packs (RMV ...COMPL in printout). The commands are listed according to the hierarchy of the packs in the frame.

If the CCI cannot be restored, enter **UTL : :BOOT, FRAME!** and, after the boot completes, restore the CCI to service.

- If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.

Table 2-5. Sync and Controller Fuses (CEF)

Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
1SPU /14-160	0TLI2 /10-112		EBX /04-128
	0TLI3 /10-120		CPU2 /04-120
	0TLI4 /10-128		EMTC /04-112
	0DPLL /12-084		CI /04-136
	1TLI4 /10-136		EBX /04-128
	1TLI3 /10-144		CPU2 /04-120
	1TLI2 /10-152		EMTC /04-112
	1TLI1 /10-160		CI /04-136

Table 2-6. Sync and Controller Fuses (non-CEF)

Synchronizer		Main Controller	
Power Unit/ Location	Associated Circuit Pack/Location	Power Unit/ Location	Associated Circuit Pack/Location
0SPU /227-010	0TLI1 /223-008	MCP /225-136	
	0TLI2 /223-016		BX /225-100
	0TLI3 /223-024		CPU2 /225-108
	0TLI4 /223-032		MTC /225-120
	0DPLL /225-076		CI /225-128
A8 FUSE	0TB /227-032	PU /225-148	
1SPU /227-064	1TLI1 /223-064		BX /225-100
	1TLI2 /223-056		CPU2 /225-108
	1TLI3 /223-048		MTC /225-120
	1TLI4 /223-040		CI /225-128

Table 2-7. IFTU Fuse Assignment

Fuse Boards	Designation (Note)	Associated Plug-Ins
ED-9C011-30 ED-9C011-30	+5A1 through +5A4 (1-4 through 17-20) +5A5	4 plug-ins (8 NPCs) per fuse (see +5A5 below)
ED-9C012-30 ED-9C011-30	+5A1 through +5A4 (1 through 20) +5A5, number 1 +5A5, number 2 +5A5, number 3 +5A5, number 4 +5A5, number 5	1 plug-in (2 NPCs) per fuse CPU UBX FTMI 0-Side FC 1-Side FC

Note: Designations +5A1 through +5A4 correspond to the modules (shelves) of the unit. The fuse numbers correspond to the plug-ins on the shelf (either 1 for 1 or 1 fuse per 4 plug-ins, depending on the fuse board).

Table 2-8. DSPU Fuses (Flexible Bay)

Fuse	Side	DSP Position (Note)
(Top) No. 1 No. 2 No. 3 No. 4	0 DSPU	(Left Panel) First and second Third and fourth Fifth and sixth Seventh and eighth
(Bottom) No. 5 No. 6 No. 7 No. 8	1 DSPU	(Right Panel) First and second Third and fourth Fifth and sixth Seventh and eighth

Note: Each fuse supplies two DSP circuit packs.

Table 2-9. DSPU Fuses - Original Interface Bay

DSPU5		DSPU6	
Fuse or PU/ Location	Associated Circuit Pack/Location	Fuse or PU/ Location	Associated Circuit Pack/Location
(SIDE 0) 0PU/109-160 JBH/109-148	NPC641 /109-006 NPC661 /109-012 NPC681 /109-018 NPC701 /109-024 NPC721 /109-030 NPC741 /109-036 NPC761 /109-042 NPC781 /109-048	(SIDE 0) 0PU/312-160 JBH/312-148	NPC801 /312-006 NPC821 /312-012 NPC841 /312-018 NPC861 /312-024 NPC881 /312-030 NPC901 /312-036 NPC921 /312-042 NPC941 /312-048
JBG		JBG	
JBF		JBF	
JBE		JBE	
(SIDE 1) 1PU/109-142 JBD/109-148	NPC641 /109-074 NPC661 /109-080 NPC681 /109-086 NPC701 /109-092 NPC721 /109-098 NPC741 /109-104 NPC761 /109-110 NPC781 /109-116	(SIDE 1) 1PU/312-142 JBD/312-148	NPC801 /312-074 NPC821 /312-080 NPC841 /312-086 NPC861 /312-092 NPC881 /312-098 NPC901 /312-104 NPC921-310 NPC941 /312-116
JBC		JBC	
JBB		JBB	
JBA		JBA	
DCP5 /109-130	CPU5 /109-056 DSPI5 /109-062	DCP6 /312-130	CPU6 /312-056 DSPI6 /312-062

Table 2-10. CCN Fuses - Original Interface Bay

CCN0		CCN1	
Fuse/ Location	Associated Circuit Pack/Location	Fuse/ Location	Associated Circuit Pack/Location
JA1 /215-072	0CCN1 /246-150	JA1 /215-088	1CCN1 /269-150
	0TSI11 /246-014		1TSI11 /269-014
	0TSI13 /246-020		1TSI13 /269-020
JA2	0CCB1 /246-032	JA2	1CCB1 /269-032
	0TSI15 /246-026		1TSI15 /269-026
	0TSI21 /246-038		1TSI21 /269-038
JA3	0TSI12 /254-014	JA3	1TSI12 /277-014
	0TSI14 /254-020		1TSI14 /277-020
	0TSI16 /254-026		1TSI16 /277-026
JA4	0CCB2 /254-032	JA4	1CCB2 /277-032
	0TSI22 /254-038		1TSI22 /277-038
JA5	0TSI23 /246-044	JA5	1TSI23 /269-044
	0TSI25 /246-050		1TSI25 /269-050
	0TSI31 /246-056		1TSI31 /269-056
JA6	0CCB3 /246-078	JA6	1CCB3 /269-078
	0TSI33 /246-066		1TSI33 /269-066
	0TSI35 /246-072		1TSI35 /269-072
JA7	0TSI24 /254-044	JA7	1TSI24 /277-044
	0TSI26 /254-050		1TSI26 /277-050
	0TSI32 /254-056		1TSI32 /277-056
JA8	0TSI34 /254-066	JA8	1TSI34 /277-066
	0TSI36 /254-072		1TSI36 /277-072
JB1 /215-076	0TSI41 /246-084	JB1 /215-092	1TSI41 /269-084
	0TSI43 /246-090		1TSI43 /269-090
	0TSI45 /246-096		1TSI45 /269-096
JB2	0TSI51 /246-102	JB2	1TSI51 /269-102
	0TSI53 /246-108		1TSI53 /269-108
JB3	0CCB4 /254-078	JB3	1CCB4 /277-078
	0TSI42 /254-084		1TSI42 /277-084
	0TSI44 /254-090		1TSI44 /277-090
JB4	0TSI46 /254-096	JB4	1TSI46 /277-096
	0TSI52 /254-102		1TSI52 /277-102
	0TSI54 /254-108		1TSI54 /277-108
JB5	0CCB5 /246-124	JB5	1CCB5 /269-124
	0TSI55 /246-118		1TSI55 /269-118
	0TSI61 /246-130		1TSI61 /269-130
JB6	0TSI63 /246-136	JB6	1TSI63 /269-136
	0TSI65 /246-142		1TSI65 /269-142
JB7	0CCB6 /254-124	JB7	1CCB6 /277-124
	0TSI56 /254-118		1TSI56 /277-118
	0TSI62 /254-130		1TSI62 /277-130
JB8	0TSI64 /254-136	JB8	1TSI64 /277-136
	0TSI66 /254-142		1TSI66 /277-142

Table 2-11. 77-Type, FTU Fuses - Original Interface Bay

Fuse (Note)	Associated NPCs			
	FTU 1	FTU 2	FTU 3	FTU 4
CA	1-8	161-168	321-328	481-488
CB	9-16	169-176	329-336	489-496
CC	17-24	177-184	337-344	497-504
CD	25-32	185-192	345-352	505-512
CE	33-40	193-200	353-360	513-520
CF	41-48	201-208	361-368	521-528
CG	49-56	209-216	369-376	529-536
CH	57-64	217-224	377-384	537-544
CI	65-72	225-232	385-392	545-552
CJ	73-80	233-240	393-400	553-560
CK	81-88	241-248	401-408	561-568
CL	89-96	249-256	409-416	569-576
CM	97-104	257-264	417-424	577-584
CN	105-112	265-272	425-432	585-592
CO	113-120	273-280	433-440	593-600
CP	121-128	281-288	441-448	601-608
CQ	129-136	289-296	449-456	609-616
CR	137-144	297-304	457-464	617-624
CS	145-152	305-312	465-472	625-632
CT	153-160	313-320	473-480	633-640
CU	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4	(0)FC 1-4
CV	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4	(1)FC 1-4
JW	FTMI 1-4	FTMI 1-4	FTMI 1-4	FTMI 1-4
JX	CPU, UBX	CPU, UBX	CPU, UBX	CPU, UBX

Note: The unit number that the fuses supply is identified on the fuse panel.

Clear Power Unit Trouble

1. To see which power unit has failed, enter **UTL : :QRY,ALMS!**.



NOTE:

The failed power unit is indicated by an "M" in the PWR line of the message. The left-to-right assignment on the PWR line is: positions 1 through 6 for units 1 through 6, 7 and 8 for syncs 0 and 1, 9 and 10 for ECCN sides 0 and 1, and 11 through 20 for units 7 through 16.

2. At the frame, locate the power unit with the lighted **ALM** LED. Figure 2-2 shows the relationship of the power units to the FTUs in an original interface bay and the power units in an IFTU of a flexible bay. The DSPU power units are mounted the same in both type bays.

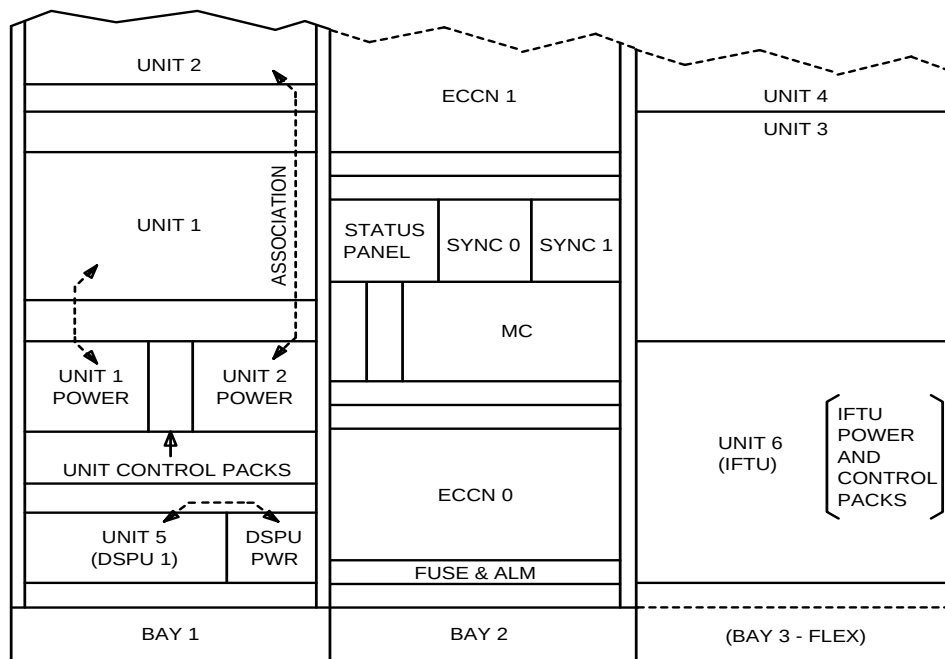


Figure 2-2. Retrofit Frame

3. If the **ALM** indicator is lighted on any power unit, then proceed to Step 6.
 - If no **ALM** indicator is lighted, then continue with Step 4.
4. See Note. With digital multimeter (such as KS-20599), check the outputs of the power units identified by the ALMS message. Measure between + and –V (and V2) jacks Table 2-12.

⇒ **NOTE:**

The FTU power units feed a common bus, and low voltage can only be detected if one power unit is failed or disconnected.

Table 2-12. Power Unit Requirements

Power Unit Code	Output Requirement (DC Volts)	Meter Connections	
		Positive Lead	Negative Lead
SM565	+11.75 to +12.25 –11.75 to –12.25	+V2 –V2	RTN RTN
411AA	+5.1 to +5.3	+	–
TG58	+4.75 to +5.25 –4.95 to –5.45	+	–
424AA	+5.0 to +5.5	+	–
485AB	+5.1 to +5.4	+	–
SM566	+4.75 to +5.25	+	–
563A	+4.9 to +5.3	5.5V	GRD

5. If the requirement of Table 2-12 is met, re-install any power unit that was removed and proceed to Step 11.
 - If the requirement of Table 2-12 is not met, continue with Step 6.
6. Reseat the suspect power unit by moving the latch switch to open and then back to closed.

⇒ **NOTE:**

To find a failed FTU, power unit (when LED is not lighted), use the process of elimination. Remove one power unit for that FTU and check for low voltage; reinstall that unit, remove a different one, and measure again. Repeat until you can determine which one causes the low voltage.

7. If the **ALM** indicator on the replacement goes off and remains off, proceed to Step 11.
 - If the **ALM** indicator does not go off and remain off, continue with Step 8.
8. See Notes 1 and 2; enter **RMV: :UNIT [q]q,UC!** to avoid possible ESR COND 31 message. Replace the suspect power unit with one that has the same equipment code.

⇒ **NOTE 1:**

To find a failed FTU power unit (when LED is not lighted), use the process of elimination. Remove one power unit for that FTU and check for low voltage; reinstall that unit, remove a different one, and measure again. Repeat until you can determine which one causes the low voltage.

⇒ **NOTE 2:**

Insertion of a power unit into a unit can produce an ESR COND 31 message and result in the unit UC being taken out of service. The unit UC can be manually removed before inserting the power unit to avoid the trouble message.

9. If the **ALM** indicator goes off and remains off, continue with Step 10.
 - If the **ALM** indicator does not go off and remain off, clear wiring trouble between power unit and unit fuses using the appropriate schematic listed below. After the trouble is cleared, the circuit packs affected by the power loss will still have to be restored to service per Figure 2-3.
 - SD-96699-01 for CEF
 - SD-96658-01 for non-CEF multibay frame
 - SD-96684-01 for single-bay frame.
10. If the unit UC was removed from service, enter **RST: :UNIT [q]q,UC!**.
11. To allow future alarms from subject power unit, enter **UTL: :CLR,PWR pp!**

Where: pp = 00 for all power units, 01 through 06 for corresponding unit, 07 or 08 for sync 0 or 1, 09 for ECCN0, and 10 for ECCN1, and 11 through 20 for corresponding power unit.

12. Enter **UTL::QRY,00S!** to see which packs have been autonomously removed from service.

**NOTE:**

The out-of-service status is indicated by the presence of a "1" in the out-of-service column for each pack. Unequipped NPCs are indicated by dashes.

13. Use the RST commands in Figure 2-3 to restore affected packs to service; MC and sync packs will be reset/restored (and sync will go to fast start) when power is reapplied.
 - If ETSIs (expanded time slot interchange) cannot be restored after a DSPU failure, do the following and retry the ETSI restoral after each corrective action. First, remove and restore the subject unit UC.
 - If the ETSIs still cannot be restored, remove any DMBs for those units from service, reseal them in the slots, and restore them.
 - If the ETSIs do restore, this procedure is completed.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSI,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 2-3. Maintenance Command Construction

Recover From Loss of Input Power

Overview: The most direct approach to recovering from a total input power loss is to simply reset the frame after the 48 V power is restored. The MC and sync packs will be reset/restored (and the sync will go to fast start). Unit and ECCN packs that are out-of-service must be restored using manual input commands. One factor that changes the reset operation is that if the DACS II cannot boot from the PMEM. This would only apply if the PMEM was corrupted because it was being written to at the time of the power loss. In this case, the PMEM card must be replaced with the most recent backup copy. If SMEM was in service at the time, it will also be corrupted and the archived memory card should be used. This archived copy should be placed in the PMEM slot.

 NOTE:

The database in the circuit pack memories is lost after a power failure, but the database can be restored from the flash cards, if they have not been corrupted.



CAUTION:

To prevent damage to the power converters from a power surge, disconnect converters before restoring power.

1. After the power is restored, reinsert the power units. Wait 30 minutes (not necessary if power is off only momentarily) for the sync TB ovens to heat up and, on the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
2. Watch the output messages. The reset will go through CI and MP STARTUP to the point where the system will attempt to use the PMEM to boot the frame.
 - If any STARTUP STF message is received, go to *Controller and Link Troubles* to clear startup trouble.
 - If BOOT FROM PMEM message was not received, continue with Step 3.
 - If the reset sequence proceeds to the receipt of RESET COMPL (with no COND code) message, proceed to Step 16.
 - If the reset sequence proceeds to the receipt of RESET COMPL (with COND code) message, go to *Data Base Troubles* to clear conditional reset.
3. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.

4. Replace the failed PMEM memory card with the most recent SMEM memory card (this may be the one currently installed in the SMEM slot on the CPU2 or it may be the most recent archived copy).
5. Insert a spare memory card in the SMEM slot.
6. Physically insert the CPU2 back into the slot.
7. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
8. The System should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, continue with step 16.
9. If the boot does not complete or the original problem persists, then the replacement card is also corrupted, continue with the next step. This is most likely to occur when the replacement card for PMEM was the SMEM card currently being used in the system. If the cards are mirror images of each other, i.e., both PMEM and SMEM are IS at the time the problem occurred, it is likely that both cards will contain the problem.
10. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.
11. Replace the failed PMEM memory card with the most recent archived memory card.
12. Physically insert a spare memory card in the SMEM slot.
13. Physically insert the CPU2 back into the slot.
14. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
15. The system should be brought into service with the correct version of the executables and database.
16. To restore the SMEM card, enter the following command:

RST : : SMEM, BKGRND

⇒ NOTE 1:

This command will overwrite the SMEM card with the contents of the PMEM card.

⇒ NOTE 2:

Any database changes made since the last archived copy was made, must be redone.

17. If early codes of NPCs (Series 2 DMBs) are installed, these codes will have to be disconnected from the frame and reinserted (reset by power up) in order for the packs to be restored to service.

18. Enter **UTL : : QRY, ALL !** to obtain listing of out-of-service, failed, and pested plug-ins.

**NOTE:**

Out-of-service, failed, and pested plug-ins are indicated by the presence of a "1" in the respective columns of the output message for each plug-in; unequipped NPCs are indicated by dashes.

19. To check only common equipment, enter the following command and read the output per Figure 2-4:

UTL : : QRY, {OOS | FAIL | PEST | ALL}, COMMON !.

M...UTL QRY <parameter> g h i j k l m n o p EOM

g = Link 1
 h = Link 2
 i = Link 3
 j = Link 4
 k = Link 5
 l = Link 6
 m = Cross-Connect Side 0
 n = Cross-Connect Side 1
 o = CCI 0 / CCNI 0
 p = CCI 1 / CCNI 1

Figure 2-4. Common Equipment Readout

20. See Note. If any CPs are equipped but out-of-service, enter the RST (restore) command per Figure 2-5 for the pack.
- If command denial occurs, find the meanings of the condition codes in *Command Denials*.

**NOTE:**

When a CP in a duplex/protected network (ECCN, DSPU, DS3U) fails, service is switched and all the CPs on the failed side/group are removed from service and pested. To correct the problem, the failure must be cleared so the side (or all CPs) can be restored. If both sides/groups are failed, trouble must be cleared on the out-of-service side/group first; removal of the other side will be denied.

21. If any CPs are failed, enter the DGN (diagnose) command per Figure 2-5 for the pack.
 - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear failed diagnostic.
 - If diagnostic passes, enter RST command.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 2-5. Maintenance Command Construction

22. To check for out-of-service, failed, and pested CPs, enter **UTL::QRY,ALL[,UNIT [q]q]!**.
23. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 2-5.
 - If command denial occurs, find the meanings of the condition codes in *Command Denials*.
 - If there are no pested CPs or command denials did not occur, this procedure is completed.

Facility Alarms

3

Contents

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This chapter contains the procedures to clear facility alarms on 2.048-Mb/s that connect to the DACS II.

⇒ NOTE:

If you already have isolated the alarm to one of the facility alarms listed, you can proceed directly to the procedure for that alarm; otherwise, you should go to *Trouble Identification* to first isolate the trouble.

Familiarize yourself with the following equipment considerations.

- The IFTU (and older FTU) equipment and the DS3U or HDS3U equipment terminate external facilities; the DSPU equipment does not. Any type unit can be placed in any of the three unit positions in a flexible interface bay.
- There is an NPC (network processing circuit) in the DACS II for each facility; this NPC performs the primary block circuit function. The NPC commands, including the STATE query, are operative for any type NPC. For 2.048-Mb/s terminations, the circuitry for two NPCs is mounted on a single DPC (dual primary card) plug-in unit.
- Replacing the NPC plug-in equipment is not the first line of action in clearing a facility trouble. Not only are multiple line signals affected (two 2.048 Mb/s lines per plug-in) when the plug-in is replaced, but it can take over 30 seconds for the line signal to be restored.

Clear 2.048-Mb/s Facility AR01 MISC ALM Message

Overview: This procedure isolates the cause of an incoming or outgoing signal problem to either the facility or the DACS II equipment and provides the interpretation of received alarm signals. The alarm message also indicates the alarm status: PMA for prompt maintenance, DMA for deferred maintenance, or MI for information. When a receive failure occurs, the DACS II sends a remote alarm signal over the facility to produce a remote alarm indication (RAI, REER, or R16) at the other end. Failure of a facility that serves as a timing link for the DACS II sync brings sync error messages.

1. If alarm cutoff is needed, enter **UTL : :ACO!**.
2. To list all current primary block alarms, enter **AUD : :QRY,CFA!** and if associated facilities are alarmed, check records and far-end conditions to determine if trouble is due to cable problem or maintenance activity. For PA type NPCs, the first character in a block can be an 'A' or an 'I', indicating that threshold crossing alarms are allowed or inhibited, respectively. For PB/PC NPCs, the first character will be a dash ('-').
 - If the alarms on other facilities are not related, continue with procedure to clear trouble on one facility and repeat for others.

NOTE:

A critical alarm indication on the status panel or a "C" at the beginning of the alarm message means six or more channel groups have failed. Failure of a facility that serves as a timing link for the DACS II sync will also cause sync error recovery messages.

3. When more than one alarm indication is received on the same facility, refer to Table 3-1 to determine the priority of the alarm types.

Table 3-1. Alarm Priorities

Priority	Alarm Type	Class	Prefix
1	R (LOS)[1]	PMA	** or *C
	P (PFWOOF)[2]	I	
2	A (AIS)	MI,DMA,or PMA	I, *, **, or *C
3	F (LOF)[2]	PMA	** or *C
4	C (LCMA)[2]	MI	I
	X (EER)	PMA	** or *C
5	V (A16)[3]	MI	I
	Y (RAI)	MI	I
	S (SFI)	MI	I
	I (RAIS)	MI	I
	B (BER)	DMA	*
6	L (LMA)[3]	PMA	** or *C
	G (FLCMA)[2]	MI	I
	E (RBER)	MI	I
7	M (RMA)[3]	MI	I

[1] R can be either LOF PBF or LOS PBF for PB/PC NPCs;
but R is LOS PBF for PA type NPCs.

[2] PA type NPCs only.

[3] These only occur with CAS line format.

4. Which alarm type appears in the MISC ALM message?
 - If **Y** or **E (Remote Alarm)**, continue with Step 5.
 - If **B, R, L, or X (Local Alarm)**, proceed with Step 8.
 - If other (**A, V, M, I, S, C, F, G, P**), proceed to Step 12.
5. At jack on DPC pack or at line interface jacks (if provided), use office test set to check signal at the MON jack for the transmit line (from DACS II).
 - If good clock signal with no alarms was detected, continue with Step 6.
 - If good clock signal with no alarms was not detected, proceed to Step 15 and replace the plug-in for the NPCs.

 NOTE:

The TG182 provides two 120 Ohm E1 line terminations. The TG182 provides two transmit line monitor points, one for each NPC. The jack layout for the TG182 is shown in Figure 3-1. These monitor points are attenuated by 30 dB from the signal level at the interface.

The TG185 provides two 75 Ohm E1 line terminations. The TG185 provides two transmit line monitor points, one for each NPC. The jack layout for the TG185 is shown in Figure 3-1. These monitor points are attenuated by 26 dB from the signal level at the interface.

The TG187 provides two 120 Ohm line terminations. The TG187 provides two transmit line monitor points, one for each facility. The jack layout for the TG187 is shown in Figure 3-1. These monitor points are attenuated by 30 dB from the signal level at the interface.

The TG192 provides two software selectable 75 or 120 Ohm E1 line terminations. The TG192 provides monitor points for both the receive and transmit interfaces for both NPCs. The monitor jack layout for the TG192 is shown in Figure 3-2. These monitor points are attenuated by slightly different levels depending on the line impedance selected. These attenuation values are:

Selected Impedance	Attenuation
75 Ohms	23.75 dB
120 Ohms	20 dB

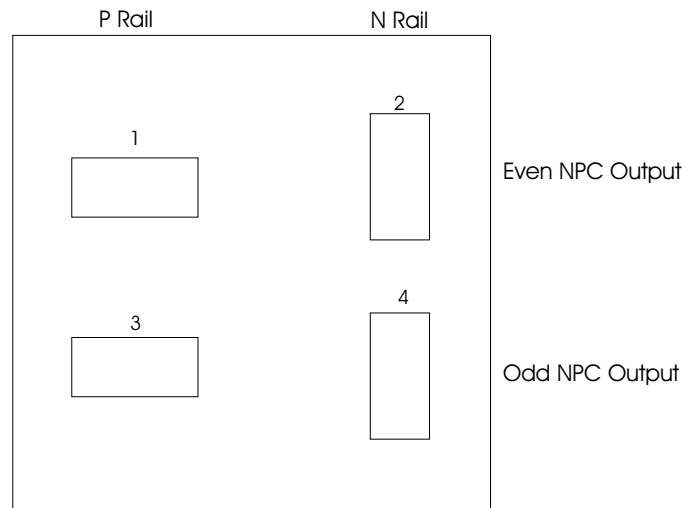


Figure 3-1. TG182, TG185, and TG187 Monitor Jack Layout

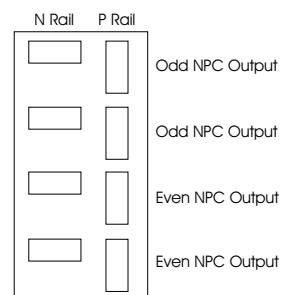


Figure 3-2. TG192 Monitor Jack Layout

⇒ NOTE:

The Y alarm type (TS0 bit 3) indicates loss of signal, excessive errors, or loss of frame alignment at the far end. The E alarm type (TS0 bit 4) indicates excessive error rate at the far end.

6. If the trouble is in the line going to the far end or in the alarm detection equipment at the far end, have far-end personnel check for pulses without errors with an external test set. If the line is at fault, have facility maintenance crew isolate trouble by testing for signal at intermediate offices. If the office equipment is at fault, replace receive pack.
7. If 2.048-Mb/s signal loopback (toward the line side) is requested at DACS II to allow testing from the far end, enter the following command:

CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],LPBK [d]t!

Where:

d = Loopback direction specifier. Required for PA type NPCs when initiating or stopping loopback. Optional if changing value of performance monitoring specifier (t). Not allowed for PB/PC type NPCs. One of the following:

- E** Equipment Loopback. Loops the outgoing 2.048 Mb/s signal back to the DACS II equipment.
- F** Facility Loopback. Loops the incoming 2.048 Mb/s bipolar signal back to the facility.
- N** Stop Loopback.

t = Loopback signal transmission performance monitoring specifier. One of following:

- A** Initiate loopback and send AIS (all 1s) downstream, reset all facility alarms/error counts, and disable facility performance monitoring.
- B** For PA type NPCs only. Initiate loopback, send AIS (all 1s) downstream/upstream and perform performance monitoring and alarm processing as usual.
- C** For PA type NPCs only. Initiate loopback with transparent pass-through of the received signal, turn off performance monitoring, and freeze the alarm and parameter counts for the NPC.
- T** Initiate loopback with transparent pass-through of the received signal.
- N** Terminate loopback.

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

For Local Alarm Indicator, Continue Here

8. The type L (LMA) indication means that there is a loss of multiframe alignment for the CAS signaling sent on time slot 16 for all service channels. Enter **UTL: :QRY, STATE, NPC <npc No.>!** for alarmed facility and verify that the NPC is provisioned for CAS (see Note).

Where: <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

⇒ NOTE:

The first digit of the NPC growth specification will be an odd number when the CAS option is selected.

9. If line interface jacks are provided, use the office test set to test signal at the MON jack for the receive line (to DACS II). The incoming line failure may be due to signal loss, loss of framing, or bit error rate greater than 10^{-3} .
 - If good clock with no alarms is detected, then proceed to Step 15 and replace the plug-in for the NPC.
 - If good clock was not detected, then continue with Step 10.
10. If the trouble is on the incoming facility or at far-end equipment, have far-end personnel check the signal with external test set. If the line is at fault, have maintenance crew isolate trouble by testing for signal at intermediate offices.

**NOTE:**

The type L alarm is not likely to be caused by the line; the far-end transmission equipment is suspected.

11. If 2.048-Mb/s line signal loopback (toward line-side) is requested to allow testing from the far end, enter the following command:

CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],LPBK t!

Where:

t = One of following: t=A to initiate loopback and send AIS (all 1s) downstream, reset all facility alarms/error counts, and disable facility performance monitoring; t=T to initiate loopback with transparent pass-through of received signal; t=N to terminate loopback.

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

For Alarm Type A, V, M, I, S, C, F, G, P Continue Here

12. Which alarm type appears in the MISC ALM message?
 - If **M**, proceed to Step **13**.
 - If **S**, notify the connecting DACS II tester to use ERR ESR SYNC to isolate the trouble. The type S (sync failure indication) means that the far-end DACS II frame timing has gone into the holdover mode. During holdover, the internal clock is supplying the signal without receiving timing from external timing links.
 - If **A, V, or I**, an alarm indication signal is being received from the far-end equipment, either on all channels (type A-AIS), on TS16 (type V-A16), or on TS0 bit 4 (I-type RAIS - remote AIS). This alarm is sent to indicate trouble upstream without registering a PBF; consequently, the trouble is isolated to the section with the PBF and RAI alarms. The alarm will clear when the trouble is cleared in the upstream equipment.
 - The **C, F, G, and P** alarms apply to PA type NPCs and indicate trouble upstream. For **F** and **P**, the unframed "All Ones" 2-Mb/s signal is sent downstream by DACS II. All of these alarms will clear when the trouble is cleared in the upstream equipment.
13. The type M (R16) indication appears when signaled from the far end equipment over time slot 16. This indicates that the far-end has lost multiframe alignment for CAS signaling in time slot 16 and consequently, has an LMA alarm.
14. Enter **UTL::QRY, STATE, NPC <npc No.>!** for alarmed facility to verify that the NPC is provisioned for CAS format (see Notes 1 and 2).

⇒ NOTE 1:

The first digit of the NPC growth specification will be an odd number when the CAS option is selected.

⇒ NOTE 2:

If the far end clears the trouble, the type M (R16) alarm will clear; otherwise, you may have to assist in troubleshooting.

To Replace Plug-In for NPC, Continue Here

15. Verify that NPC for alarmed facility is out-of-service (RMV NPC ...COMPL in printout) to allow more complete diagnostic testing; if necessary, enter **RMV::NPC <npc No.>[, INCL]!**

Where: INCL = Optional, needed to remove NPC with special circuits.

16. Enter **DGN::NPC <npc No.>!**.
 - If DGN ...STF message is received, continue with Step 17.
 - If DGN ...STF message is not received, the trouble is in cabling to the line interface jacks. Repair or replace the cabling; after trouble is cleared, enter **RST::NPC <npc No.>!** for each of the removed NPCs.

⇒ NOTE:

The diagnostic tests the NPC transmission paths except for the line transformers. So, if cabling is not at fault, the NPC could still be causing the trouble.

17. Arrange a time when both NPCs on the dual DPC card can be removed from service; enter **RMV::NPC <npc No.>[, INCL]!** for other NPC, and replace the dual pack.
18. Enter **RST::NPC <npc No.>!** for each of the removed NPCs.

Clear 2.048-Mb/s Facility Error Messages

Overview: This procedure is used to clear alarms that are registered when any facility errors reach alarm threshold levels. The parameters that the DACS II monitors are: bit error rate (BER), errored seconds (ERS), severe ERS (SERS), slips (SLIP), out-of-frame (OOF), framing error (FRER), cyclic redundancy (CRC), change of frame alignment (COFA), degraded minutes (DM), loss of frame alignment (LOFA), minor error rate (MER), and unavailable seconds (US).

For PA type NPCs, the threshold alarms are: code violations (CV), framing errors (FRER), CRC block errors (CRC), unavailable time count (UATC), controlled slip seconds (CSS), out-of-frame seconds (OOF), errored seconds (ES), severely errored seconds (SES), unavailable seconds (UAS), multiframe errors (MER), far-end block errors (FEBE), far-end errored seconds (FES), far-end severely errored seconds (FSES), and far-end unavailable seconds (FUAS).

The troubleshooting strategy is to first verify that correct NPC alarm options are selected, have the far end check for errors in the transmit direction, and then use signal loopback to check the digital line.



CAUTION:

The line looping in this procedure interrupts service on all channels of the line, so service will have to be removed or patched to another facility. For minor alarms (not service affecting), you may want to postpone testing until nonbusy hours.



NOTE:

The type of error (SLIP or ERS) and whether on a new facility often indicates the source of the trouble. Timing SLIPS are usually caused by not having the far end optioned for loop timing or by a loop timing pack not functioning. This is more likely to occur on a new facility as incorrect NPC provisioning. The other parameters indicate facility problems.



NOTE:

If threshold crossing alarms need to be temporarily disabled while performing this procedure for PA type NPCs, use the **CHG: :NPC <npc No.>, THMODE <mode>!** command, where **<mode>** is **INH** (inhibit).. In this mode, no threshold crossing messages are output. To exit this mode, enter the same command with **<mode>** set to **ALW** (allow). The previously programmed threshold values are re-applied unless they were changed while in the inhibit mode.

1. If alarm cutoff is not already operated, enter **UTL : :ACO!**.
2. Enter **UTL : :QRY, STATE, NPC <npc No.>!** for NPC on alarmed facility.

Where: <npc No.> = NPC number, either extended (for example, [0]001)
or hierarchical (for example, 01101).

3. Read the selected alarm threshold for the facility parameter from the output message and compare to office records or other (same type) NPCs.

- If the alarm threshold for the parameter is incorrect, enter the following command with the required parameter identifiers:
CHG : : {NPC <npc No.> | TYPE mnxyz}, OPTS (rr/l, ss/m ..., tt/n)!

Where:

NPC or = Selects number of NPCs to be changed: one
TYPE field NPC given as extended (for example, [0]001),
hierarchical (for example, 01101), or all NPCs
with the same type specification (mnxyz).

rr,ss,tt = Listing of any of the associated alarm types.
See Table 3-2.

l,m,n = Predefined number (0 through b) per Table
3-3 which selects alarm threshold. Monitoring
of a parameter can be disabled by entering
"c" for the alarm threshold.

Table 3-2. 2.048-Mb/s Interface Alarm Parameters (PA/PB/PC Type NPCs)

Facility Parameter (rr,ss,tt)	Meaning
11	Type PA CRC, 24 Hr.
12	Type PA FRER, 24 Hr.
13	Type PA OFS, 24 Hr.
14	Type PA ES, 24 Hr.
15	Type PA SES, 24 Hr.
16	Type PA CSS, 24 Hr.
17	Type PA CV, 24 Hr.
18	Type PA UAS, 24 Hr.
19	Type PA UATC, 24 Hr.
20	Type PA MER, 24 Hr.
21	Type PA FEBE, 24 Hr.
22	Type PA FES, 24 Hr.
23	Type PA FSES, 24 Hr.
24	Type PA FUAS, 24 Hr.
31	Type PB/PC DM, 1 Hr.
32	Type PB/PC DM, 24 Hr.
33	Type PB/PC SERS, 15 Min.
34	Type PB/PC SERS, 24 Hr.
35	Type PB/PC ERS, 15 Min.
36	Type PB/PC ERS, 24 Hr.
37	Type PB/PC US, 15 Min.
38	Type PB/PC US, 24 Hr.
39	Type PB/PC SLIPs, 15 Min.
40	Type PB/PC SLIPs, 24 Hr.
81	Type PA CRC, 15 Min.
82	Type PA FRER, 15 Min.
83	Type PA OFS, 15 Min.
84	Type PA ES, 15 Min.
85	Type PA SES, 15 Min.
86	Type PA CSS, 15 Min.
87	Type PA CV, 15 Min.
88	Type PA UAS, 15 Min.
89	Type PA UATC, 15 Min.
90	Type PA MER, 15 Min.
91	Type PA FEBE, 15 Min.
92	Type PA FES, 15 Min.
93	Type PA FSES, 15 Min.
94	Type PA FUAS, 15 Min.

Table 3-3. 2.048-Mb/s Interface Option Selection

Alarm Class	Option 0 (Default)	Option 1	Option 2	Option 3*
MI (Info)	0	3	6	9
DMA (Deferred)	1	4	7	A
PMA (Prompt)	2	5	8	B

* Only valid option for PB/PC types.

Note: C - disables monitoring of a facility parameter

4. Enter **UTL::CLR,<parameter>,NPC <npc No.>[-<range>]!**, and, after recording period, enter **UTL::QRY,<parameter>,NPC <npc No.>!**.

Where:

<parameter> = For 2.048-Mb/s facility:

PB/PC types: CRC, DM, ERS, FRER, MER, SERS, SLIP, or US. Use PM to clear DM, ERS, SERS, SLIP and US.

PA types: CRC, FRER, MER, ES, SES, UAS.

<range> = Optional, last NPC of continuous range.

5. If an alarm is received on facility or error count is still near alarm threshold, continue with Step 6.
 - If there is no alarm or high error counts, there is no trouble at this time; either return facility to service and watch for further trouble or test the facility for a longer period.
6. At far end, have tester connect external test set to MON jack at line interface bay for transmit direction and check for errors.
 - If errors were registered (and far end has DACS II), have far-end tester refer to Step 13.
 - If errors were registered (and far end does not have DACS II), refer trouble to tester at far-end terminal equipment.
 - If errors were not registered at far end, continue with Step 7.



CAUTION:

Signal looping in the following portion will interrupt service on all channels of the line; service must be patched to another facility or customers notified of loss of service.

7. In the following portion, a signal loopback will be established at line interface bay at one end so that the other end can check the entire line (both directions) for errors.
8. Either patch service to another facility or arrange for facility to be taken out-of-service.
9. Have the far-end tester place a loop on the line side at line interface bay to loop the signal toward you.
10. At end receiving looped signal, either check errors again with test set, or with DACS II, enter **UTL::CLR,<parameter>,NPC <npc No.>!** and, after recording period, enter **UTL::QRY,<parameter>,NPC <npc No.>!**.
 - If alarm is received or high error count is still received, continue with Step 11.
 - If alarm or high error count is not received, there is an intermittent line trouble or the far-end terminal was causing errors. Either return the facility to service and watch for further trouble or test the facility (or far terminal) for a longer period.
11. At end receiving looped signal, place looping cord on equipment side jacks on line interface bay to test local cabling and receive equipment. Have far-end personnel remove any line-side signal loop.
12. Either check errors again with test set or enter **UTL::CLR,<parameter>,NPC <npc No.>!** and, after recording period, enter **UTL::QRY,<parameter>,NPC <npc No.>!**.
 - If alarm is received or high error count is still received, continue with Step 13.
 - If alarm or high error count is not received, there is trouble on the facility. Remove signal loopback and isolate defective span line by placing signal loops (or testing) at intermediate offices. After trouble is cleared, remove all line-interface bay signal loops.

13. Enter **RMV::NPC <npc No.>[, INCL]!** to remove the involved NPC from service in order to run complete diagnostics.

Where: INCL = Optional, needed to remove NPC with special circuits.

⇒ NOTE:

The NPC itself is not a likely source of errors. The out-of-service diagnostic checks some transmit and receive error detecting and clearing circuits. The NPC line transformers are not included in internal loop during the diagnostics.

14. Enter **DGN::NPC <npc No.>!**.
15. If DGN ...STF message is received, continue with Step **16**.
 - If DGN ...STF message is not received, there is trouble in cabling to line-interface bay; repair or replace cabling.
16. Arrange a time when both NPCs can be removed from service. Enter **RMV::NPC <npc No.>[, INCL]!** for that NPC and replace the card.
17. Enter **RST::NPC <npc No.>!** for each NPC. Remove all line interface bay signal loops.

⇒ NOTE:

The parameter counts are cleared during restore operation.

Check Facility ALM IDLD or INFO Message

Overview: This procedure deals with facility alarm IDLD (idled) and INFO (information) messages. Alarm idled messages are received after the line signal is restored on a facility that previously had a PBA (primary block alarm). Alarm information messages are received on 2.048-Mb/s lines when an alarm condition designated as maintenance information occurs. Alarm idled messages do not occur after minor alarms due to facility error (for example, for SLIP or BER) are cleared. The error counts for these parameters are checked and the counts are cleared using utility commands.

1. Which one of the following keywords appears in the message?
 - If **IDLD**, then continue with Step 2.
 - If **INFO**, proceed to Step 5.
2. This message reports that an alarm has cleared. For facility alarms, the NPC and the type of alarm are given in the message; for example, PBA (primary block alarm) and facility parameter BER.
3. For the PBA type, you can relate the IDLD message to the alarm onset message by the NPC number. Table 3-4 gives the meanings of the alarm types that appear in the alarm onset message for reference.

Table 3-4. PBA Alarm Parameters

Indicator	Meaning
A	All 1s signal (AIS) received from far end.
B	Incoming high bit error rate (BER).
C	Loss of CRC4 multiframe alignment in TS0 (LCMA). [Note 3]
E	Excessive errors received at far end (REER).
F	Loss of frame (LOF). [Note 3]
G	Far-end loss of CRC4 multiframe alignment in TS0 (FLCMA).
I	Remote all 1s indication (RAIS).
L	Loss of multiframe alignment (LMA). [Note 1]
M	Remote loss of alignment sent on TS16 (R16). [Note 1]
P	TS0 pseudo-frame word out-of-frame (PFWOOF).
R	Loss of signal primary block failure (LOS PBF); loss of frame primary block failure (LOF PBF). [Note 2]
S	Far end sync has gone into holdover (Sync Fail Indication).
V	All 1s indication on TS16 (A16). [Note 1]
X	Incoming excessive error rate (EER).
Y	Remote alarm indication (RAI).

Note 1: These only occur with CAS line format.

Note 2: R can be either LOF PBF or LOS PBF for PB/PC NPCs;
but R is LOS PBF for PA NPCs.

Note 3: PA type NPCs only.

- If the message is for a timing link failure (ESR SYNC messages), refer to Table 3-5 for the meaning of the alarm type.

Table 3-5. Keyword Meanings

Alarm Keyword	Meaning
AIS	Alarm indication signal
BER	Bit error rate high
LOS	Loss of signal
LEN	Loss of energy
EXJ	Excessive jitter
PHS	Phase shift
OOF	Out of frame
MAJ	Error rate, major alarm
MIN	Error rate, minor alarm

5. An "A" after the PBA word and NPC number reports the receipt of an AIS (alarm indication signal, all 1s, blue signal) from the far end.

**NOTE:**

The far-end NPC can be grown to send an all 1s signal when it is removed from service.

Enter Commands to Check 2.048-Mb/s Line Loopback and Operate Line Loopback

Overview: This procedure contains the commands to check the loopback status of NPC and to change/operate the loopback. This loopback is of the entire framed signal (256 bits). The loopback is toward the line side and can be used to check transmission and alarms at the far end. The diagnostic NPC command at DACS II is used to verify the operation of the DPC (dual primary card) at the DACS II.

1. If you want to check the current loopback status, continue with Step 2.
 - If you want to operate (or change) the line loopback, proceed to Step 4.
2. Enter the command to check the loopback status as follows:
UTL:[FRM xy,SEQ ww]:QRY,LPBK,NPC <npc No.>[-<range>]!
Where:
 - xy = Optional, DACS II frame number.
 - ww = Optional, command sequence number.
 - <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).
 - <range> = Optional, last NPC of continuous range of NPCs.
 - If UTL ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
3. Read the loopback state of the NPC from the output message and note the following about accompanying message keywords. An AIS means all 1s signal is sent downstream, and an fpa-off means that the NPC monitoring (facility performance alarms) of facility errors is disabled.

4. To change the loopback state, enter

CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],LPBK [d]t!

Where:

d = Loopback direction specifier. Required for PA type NPCs when initiating or stopping loopback. Optional if changing value of performance monitoring specifier (**t**). Not allowed for PB/PC type NPCs. One of the following:

- E** Equipment Loopback. Loops the outgoing 2.048 Mb/s signal back to the DACS II equipment.
- F** Facility Loopback. Loops the incoming 2.048 Mb/s bipolar signal back to the facility.
- N** Stop Loopback.

t = Loopback signal transmission performance monitoring specifier. One of following:

- A** Initiate loopback and send AIS (all 1s) downstream, reset all facility alarms/error counts, and disable facility performance monitoring.
- B** For PA type NPCs only. Initiate loopback, send AIS (all 1s) downstream/upstream and perform performance monitoring and alarm processing as usual.
- C** For PA type NPCs only. Initiate loopback with transparent pass-through of the received signal, turn off performance monitoring, and freeze the alarm and parameter counts for the NPC.
- T** Initiate loopback with transparent pass-through of the received signal.
- N** Terminate loopback.

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC of continuous range of NPCs.

- If CHG ...COMPL message is received, find the meanings of the condition codes in *Command Denials*.
5. Check the output message to verify the loopback state.

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This chapter contains the procedures for clearing hardware troubles that are detected and processed by the DACS II error recovery operation.

Error recovery is an autonomous operation in the DACS II. This activity is evidenced by ERR ESR messages and the service removal and diagnostic failure on a plug-in. The failure brings a major office alarm. For failures in the duplicated circuit groups (sync, cross-connect network, etc.), the service removal is preceded by a side switch to the duplicated side to maintain service.

⇒ NOTE:

Never replace packs or take packs from the active side of a duplicated group (for example, SYNC) when the other side is failed. The in-service side is carrying service; it is not a source of spare plug-ins.

Error Recovery Operation

Error recovery begins with the detection of an internal hardware error, proceeds with a monitoring period (hit timing) to verify that the trouble was not a transient, and results in the service removal of the failed pack. This recovery process evaluates all error inputs (including power converters) and, if the trouble is not transient, reports the service removal and the diagnostic failure on the most likely cause of the trouble. When more than the failed pack itself can cause the trouble, the other packs are listed in the ERR ANALYSIS REPORT. A side switch occurs for any single failure on the active side of a duplicated (or protected) circuit group. For a power converter failure, only high-level control packs are removed from service so that fewer packs need to be restored after the trouble is cleared. If needed to enable maintenance on the MC, error recovery will place the frame in the maintenance condition as evidenced by the RST MC MCOND message.

Cross-Connect Side Out-of-Service

Clear ALM ECCN OOS Message

Overview: This alarm indicates that one side of the ECCN is out-of-service and troubleshooting is required to return the side to service. The alarm must be cleared because a failure on the other side or inadvertent maintenance activity on the other side could cause loss of customer service. To force this maintenance effort, the DACS II goes to a major alarm if the initial minor alarm indication is pested for more than 2 minutes because of other alarms. The DACS II does not remove a failed pack when its mate on the other side is already out-of-service; the alarms on the active side are pested.

**CAUTION:**

Never replace packs or take packs from the active side of a duplicated group (for example, ECCN) when the other side is failed. The in-service side is carrying service; it is not a source of spare plug-ins.

**NOTE:**

If you have not checked for power troubles (per the *Trouble Identification* section), do so before proceeding.

1. If ESR ...ANALYSIS REPORT message occurs in the printout, notice the listing of implicated plug-ins (see Note) in the message and proceed to Step 3; otherwise, continue with Step 2.

**NOTE:**

The plug-ins are listed in the order of likelihood of causing the trouble, and the first plug-in will already be removed from service.

2. If the pack has been autonomously removed from service (with no failed DGN), try restoring the pack to service per Figure 4-1 and proceed to Step 11.
 - If pack has not been removed, notice the pack named in the DGN ...STF message and continue with Step 3.
3. Replace the first pack named in the ESR ...ANALYSIS REPORT or the pack named in the DGN ...STF message if no ANALYSIS REPORT.
4. Enter command to restore the replacement to service per Figure 4-1. If associated ETSIs on mate NPC were removed, enter command to restore those packs to service.

- If DGN ...STF message is received, continue with Step 5.
- If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
- If RST ...COMPL message is received, proceed to Step 8.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSISs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-1. Maintenance Command Construction

5. If the single pack (or all packs) listed in the ANALYSIS REPORT has been replaced, proceed to Step 10.
 - If all the packs have not been replaced, continue with Step 6.
6. The previous pack was not the cause of trouble. Enter the command to remove the next pack from service per Figure 4-1. Replace the pack and repeat from Step 4.
7. If trouble persists or same trouble recurs, repeat the procedure, but this time work with the next pack listed in the ANALYSIS REPORT.
8. If another pack was autonomously removed (on other side or other protection group) after the original trouble cleared, repeat the procedure to clear next trouble.
 - If another pack was not removed, continue with Step 9.
9. Enter **UTL : :QRY,ALL!** to find packs which are still failed, pested, or out-of-service, and perform the necessary corrective action to place all equipped packs in service.

**NOTE:**

The conditions are indicated by the presence of a "1" in the respective columns (out-of-service, failed, and pested) for each pack. Unequipped NPCs are indicated by dashes.

10. From Table 4-1, find the explanation of the COND code which appears in the ERR,ESR message for the subject pack.
11. If you were able to clear the trouble using the meaning of the ESR code, go to Step 9.
 - If you were not, continue with Step 12.
12. If there are any other ERR ESR messages involving packs in other circuit groups, go to Section 4.3.
 - If there are no other ERR ESR messages, continue with Step 13.

13. To make a record of the error history on the PMEM (for use by technical consultant), enter one of the following commands (see Note):

Time of Day/Time Interval:

UTL : : QRY, ERR, HWER, {INT mn} [DATE modayr,] TOD hrmsc}!

Suspect Entity:

UTL : : QRY, ERR, HWER, ENTY eee!

Where: INT = Interval of time (past 59 minutes)

TOD = Time of day consisting of hour (hh=00 through 23),
minutes (mm=00 through 60), seconds (ss=00 through 60).

Date (month, day, year) is optional.

eee = Plug-in designation for example: CCI, DMB,
EBX, ETSI, FC, SYNC, or TLI.

⇒ NOTE:

All error events are logged on PMEM; however, the file is overwritten when the file capacity is reached. If you do not know how full the error log is (not recently cleared), you will want to use a short interval, perhaps the past 5 minutes, to avoid overloading the link with old errors.

14. Contact technical consultant.

Table 4-1. ESR Condition Codes - CCI, ETSI

COND 01	Software could not access CCI; pack does not acknowledge. Corrective Action: (1) verify that CCI is securely seated; (2) look for loss of sync to CCI and replace CCI; (3) look for MC, EBX, or CPU interface trouble.
02	Incorrect version number on CCI.
03	Summary bit set, but no other errors.
04	CCI ERR bit set in system status register.
05	ETSI ERR bit set in system status register.
06	Peripheral unit bit set in system status register.
07	Bus terminator pack absent.
08	32-MHz clock out of phase lock.
09	240 frame sync misaligned.
0A	Loss of 240 frame sync.
0B	Loss of 8-kHz frame sync.
0C	CCI detected address parity error.
0D	CCI detected low byte data parity error.
0E	CCI detected high byte data parity error.
0F	CCI -5.2 power supply failure.
10	CCI detected bus status parity error.
11	Peripheral unit alarm.
12	Sync summary bit set on CCI pack.
20	Software could not access ETSI; pack does not acknowledge. Corrective Action: see CCI action and substitute ETSI for CCI in wording.
21	Incorrect version number on ETSI pack.
22	Summary bit set, but no other errors.
23	Loss of 32.768-MHz clock.
24	Loss of 240 frame sync.
25	Receive MDX summary bit set.
26	Control RAM summary bit set.
27	Transmit MDX summary bit set.
28	Loss of 3.3-volt power from CCI pack.
29	Peripheral unit port alarm (receive MDX).
2A	Receive MDX data source time-slot parity error.
2B	Receive MDX sync error.
2C	Receive MDX address parity error.
2D	Receive MDX write data parity error.
2F	Receive cannot be accessed; incorrect chip ID.
30	Transmit MDX data parity error.
31	Transmit MDX data source time-slot parity error.
32	Transmit MDX sync error.
33	Transmit MDX address parity error.
34	Transmit MDX write data parity error.
35	Transmit MDX cannot be accessed; incorrect chip ID.
37	Control RAM parity error.
38	Control RAM sync alarm.
39	Control RAM port alarm.
3A	Control RAM BIST flag is set.
3B	Data RAM BIST flag is set.
3C	Control RAM address parity error.
3D	Control RAM write data parity error.
3E	Control RAM device cannot be accessed; incorrect chip ID.
3F	Control RAM circuit pack parity.
40	Control RAM device is in reset state.
41	Control RAM port alarm summary bit set.
42	TRD3 status exercise bit is set.
43	Ready high error detected from CCI.
44	Ready timeout error from CCI; CCI cannot access ETSI.
45	Control RAM stuck bit error.

Clear ALM CCN OOS Message

Overview: This alarm indicates that one side of the CCN is out-of-service and troubleshooting is required to return the side to service. The alarm must be cleared because a failure on the other side or inadvertent maintenance activity on the other side could cause loss of customer service. To force this maintenance effort, the DACS II goes to a major alarm if the initial minor alarm indication is pested for more than 2 minutes because of other alarms. The DACS II does not remove a failed pack when its mate on the other side is already out-of-service; the alarms on the active side are pested.

**CAUTION:**

Never replace packs or take packs from the active side of a duplicated group (for example, CCN) when the other side is failed. The in-service side is carrying service; it is not a source of spare plug-ins.

**NOTE:**

If you have not checked for power troubles (per the *Trouble Identification* section), do so before proceeding.

1. If ESR ...ANALYSIS REPORT message occurs in the printout, notice the listing of implicated plug-ins (see Note) in the message and proceed to Step 3: otherwise, continue with Step 2.

**NOTE:**

The plug-ins are listed in the order of likelihood of causing the trouble, and the first plug-in will already be removed from service.

2. If the pack has been autonomously removed from service (with no failed DGN), try restoring the pack to service per Figure 4-2 and proceed to Step 11.
 - If pack has not been removed, notice the pack named in the DGN ...STF message and continue with Step 3.
3. Replace the first pack named in the ESR ...ANALYSIS REPORT or the pack named in the DGN ...STF message if no ANALYSIS REPORT.
4. Enter command to restore the replacement to service per Figure 4-2. If associated TSIs on mate NPC were removed, enter command to restore those packs to service.

- If DGN ...STF message is received, continue with Step 5.
- If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
- If RST ...COMPL message is received, proceed to Step 8.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sfl!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSISs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-2. Maintenance Command Construction

5. If the single pack (or all packs) listed in the ANALYSIS REPORT has been replaced, proceed to Step 10.
 - If all the packs have not been replaced, continue with Step 6.
6. The previous pack was not the cause of trouble. Enter the command to remove the next pack from service per Figure 4-2. Replace the pack and repeat from Step 4.
7. If trouble persists or same trouble recurs, repeat the procedure, but this time work with the next pack listed in the ANALYSIS REPORT.
8. If another pack was autonomously removed (on other side or other protection group) after the original trouble cleared, repeat the procedure to clear next trouble.
 - If another pack was not removed, continue with Step 9.
9. Enter **UTL : :QRY,ALL!** to find packs which are still failed, pested, or out-of-service, and perform the necessary corrective action to place all equipped packs in service.

**NOTE:**

The conditions are indicated by the presence of a "1" in the respective columns (out-of-service, failed, and pested) for each pack. Unequipped NPCs are indicated by dashes.

10. From Table 4-2, find the explanation of the COND code which appears in the ERR,ESR message for the subject pack.
 - If you were able to clear the trouble using the meaning of the ESR code, go to Step **9**.
11. If there are any other ERR ESR messages involving packs in other circuit groups, go to Section 4.3.
 - If there are no other ERR ESR messages, continue with Step **12**.

12. To make a record of the error history on the PMEM (for use by technical consultant), enter one of the following commands (see Note):

Time of Day/Time Interval:

UTL : : QRY, ERR, HWER, {INT mn} [DATE modayr,] TOD hrmsc}!

Suspect Entity:

UTL : : QRY, ERR, HWER, ENTY eee!

Where: INT = Interval of time (past 59 minutes)

TOD = Time of day consisting of hour (hr=00 through 23),
minutes (mn=00 through 60), seconds (sc=00 through 60).

Date (month, day, year) is optional.

eee = Plug-in designation for example: CCB, CCNI,
DMB, DSPI, EBX, FC, SYNC, TLI, TSI.

⇒ NOTE:

All error events are logged on PMEM; however, the file is overwritten when the file capacity is reached. If you do not know how full the error log is (not recently cleared), you will want to use a short interval, perhaps the past 5 minutes, to avoid overloading the link with old errors.

13. Contact technical consultant.

Table 4-2. ESR Condition Codes - CCNI, CCB, TSI

CCNI Pack	
COND 90	Software could not access CCNI; pack does not acknowledge. Corrective Action: (1) verify that CCNI is securely seated; (2) look for loss of sync to CCNI and replace CCNI; (3) look for MC, BX or CPU interface trouble.
91	RAM error in high data byte on MC-MP. Trouble in MC (BX or CPU), or CCNI.
92	RAM error in low data byte on MC-MP. See COND 91.
93	Address parity error. Corrective Action: enter command to restore CCNI.
94	Autonomous switch error. Circuit in CCNI for side switch independent of MP disagrees with mate CCNI.
95	Bus status error. Circuit cannot determine active side. Corrective Action: (1) replace CCNI; (2) if persists, report possible software error.
96	Stuck summary bit. Error leads from CCB or TSI stuck high, but no trouble can be found. Subject CCB and TSI packs are identified in messages.
CCB Pack	
COND A0	Software could not access CCB; pack does not acknowledge. Corrective Action: (1) verify that CCB is securely seated; (2) look for loss of sync to CCB and replace CCB; (3) look for MC, BX or CPU interface trouble.
A1	Loss of sync pulse signal for approx. 100 ms. Trouble in CCB or SYNC or sync interface between.
A2	Loss of 8 MHz clock. See COND A1.
A3	Bad data from TSI ports. If most ports are reported in ESR, probably the CCB is bad. If only a few ports are reported, probably the TSIs are bad.
A4,A5	Zero bit stuck at 1 in CCB (A4) or CCNI (A5).
TSI Pack	
B0	Software could not access TSI; pack does not acknowledge. Corrective Action: (1) verify that TSI is securely seated; (2) look for loss of sync through CCB and replace TSI; (3) look for MC, BX or CPU interface trouble.
B1	Stuck summary bit that indicates troubles from TSI devices, but no actual trouble can be found.
B2	TSI device error that clears during recovery; transient error.
B3	Software could not access TSI device; device failed or lost sync clock.
B4	Diagnostic exercise bits set on TSI device. Replace TSI.
B5	Error on address bus to TSI device. Trouble in TSI, CCNI, or MC-BX pack.
B6	TSI device not receiving good sync clock. Trouble in TSI, related CCB, or SYNC.
B7	Error on TSI control RAM which defines maps. Replace TSI.
B8	Parity error on port from FC or DSPU-DMB. If most all TSI ports are reported in ESR message, replace TSI. If isolated ports are reported, the FCs or DMBs are probably bad. Adjacent NPCs that share the DBM ports will be reported although only one is bad.
B9	Parity error from CCNI.

Clear ERR ESR ANALYSIS REPORT Message

1. If a CRITICAL alarm is being registered (CRITICAL lighted on status panel LED and "*"C" message prefix), continue with Step 2.
 - If a CRITICAL alarm is not registered, go to Step 5.
2. Which of the following conditions caused the CRITICAL alarm?
 - If **multiple NPCs removed**, continue with Step 3.
 - If **both duplex sides alarmed**, proceed to Step 4.
3. Check the frame for blown fuses or failed power units. A blown fuse feeding NPCs or two failed power units for a unit would cause multiple NPC failures.
4. From the trouble printout, determine which side of the ECCN/CCN (0 or 1) has been removed from service; that will be the side on which the failed plug-in has been autonomously removed. Proceed to Step 5 and clear the trouble **on the out-of-service side**.

⇒ **NOTE:**

For duplex (both sides) failures, clearing out-of-service side will enable side switch and work on the other side. The alarm status will also change from critical to major.

⇒ **NOTE:**

The DACS II does not remove a duplicated pack when its mate is already out-of-service; instead, the DACS II posts alarms on the active side.

5. See Figure 4-3 for the general format and sequence of messages of the error recovery operation with an ERR ...ANALYSIS REPORT message. The plug-in which is most suspect will be removed from service and the diagnostic results given. Other likely causes of the trouble will also be listed in the report.

```
ERR ESR <entity> COMPL

ERR ESR ANALYSIS REPORT EVENT eeee X LN MSG:
<suspect plug-in No.1>
<suspect plug-in No.2>
<suspect plug-in No.3>
<suspect plug-in No.4> COMPL

RMV <entity> COMPL

DGN <entity> STF ppqq COMPL
```

Figure 4-3. Error Analysis Report

6. Replace the first pack named in the ESR ...ANALYSIS REPORT.
7. Enter command to restore the replacement to service per Figure 4-4. If associated ETSIs or TSIs on mate NPC were removed, enter command to restore those packs to service.
 - If DGN ...STF message is received, continue with Step 8.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
 - If RST ...COMPL message is received, proceed to Step 11.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sfl!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSIs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-4. Maintenance Command Construction

8. If all the plug-ins listed in the ERR ANALYSIS REPORT have been replaced, proceed to Step **10**.
 - If all the listed plug-ins have not been replaced, enter the command to remove the next pack from service per Figure 4-4 (see Note) and replace that plug-in. The previous pack was not the cause of trouble.

⇒ NOTE:

When facility NPCs are removed from service, the service on all channels is interrupted. Arrangements must be made to patch service or notify data customers.

9. Enter command to restore the replacement to service per Figure 4-4. If associated ETSIs or TSIs on mate NPC were removed, enter command to restore those packs to service.
 - If DGN ...STF message is received, continue with Step **10**.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
 - If RST ...COMPL message is received, proceed to Step **11**.
10. If you are clearing ERR SYNC messages, go to Section 4.4.
 - If you are not clearing ERR SYNC messages, go to Section 4.7.
11. If another pack was autonomously removed on the other side (or other protection group) after the original trouble was cleared, then repeat the procedure to clear the next trouble.
12. Enter **UTL : :QRY, ALL!** to find packs which are still failed, pested, or out-of-service and perform the necessary corrective action to place all equipped packs in service.

**NOTE:**

Out-of-service, failed, and pested plug-ins are indicated by the presence of a "1" in respective columns (out-of-service, failed, and pested) of the output for each plug-in; unequipped NPCs are indicated by dashes.

Clear ERR [ESR] <entity> Messages

1. Check for a blown fuse (see Note) and failed power units (which give ERR PWR message). Loss of power causes removal of transmission plug-ins.
 - If power trouble is present, go to *Power Failures* to clear power trouble.

⇒ NOTE:

Blown fuses are indicated by one of the following: (1) for a 48 V fuse, lighted FAL indicator and extended color bead on 48 V fuse and alarm panel, or (2) lighted LED fuse or LED indicator on unit fuse board.

2. If sync error messages occur in the printout, check if there are any timing link troubles or if timing link trouble has cleared (COND E800 series messages). See Table 4-3 for meaning of alarm keywords in ERR [ESR] SYNC TLI SSP messages.

⇒ NOTE:

If the timing link for the highest priority sync port fails and the DACS II switches to the port on the other side, it can take up to 35 minutes for the DACS II to switch back to the higher priority port.

- To force the switch back to the higher port after the timing link trouble is cleared, enter the commands to remove and restore the higher priority port as follows (the query output shows the priorities):

UTL : : QRY, ALL, COMMON !

RMV : : SYNC a, TLI n, SSP s !

RST : : SYNC a, TLI n, SSP s !

Table 4-3. Sync Alarm Keywords

Alarm Keyword	Meaning
LOS	Loss of signal
LEN	Loss of energy
EXJ	Excessive jitter
PHS	Phase shift
OOF	Out of frame
MAJ	Error rate, major alarm
MIN	Error rate, minor alarm

3. If the plug-in named in the ERR [ESR] message was autonomously removed but there was no failed diagnostic (DGN ...STF) for that plug-in, enter the RST command for that plug-in.

⇒ NOTE:

If hardware mismatch condition (COND 43) accompanies the removal of the plug-in, it indicates that the plug-in code is not correct for the type that was grown.

4. If there is a failed diagnostic (DGN ...STF), enter the command to remove the plug-in (if not already removed) per Figure 4-5, and replace the failed plug-in.

⇒ NOTE:

When facility NPCs are removed from service, the service on all channels is interrupted. Arrangements must be made to patch service or notify data customers.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSISs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-5. Maintenance Command Construction

5. Enter command to restore the replacement to service per Figure 4-5. If associated ETSIs or TSIs on mate NPC were removed, enter command to restore those packs to service.
 - If DGN ...STF message is received, continue with Step 6.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
 - If RST ...COMPL message is received, proceed to Step 7.
6. If you are clearing ERR [ESR] SYNC messages, go to Section 4.4.
 - If you are not clearing ERR [ESR] SYNC messages, go to Section 4.7.
7. If another pack was autonomously removed on the other side (or other protection group) after the original trouble was cleared, repeat this procedure to clear next trouble.
8. Enter **UTL : :QRY, ALL!** to find packs which are still failed, pested, or out-of-service and perform the necessary corrective action to place all equipped packs in service.

**NOTE:**

Out-of-service, failed, and pested plug-ins are indicated by the presence of a "1" in the respective columns (out-of-service, failed, and pested) of the output for each plug-in; unequipped NPCs are indicated by dashes.

Clear ERR SYNC Message

Overview: This procedure is used for sync troubles after completing Section 4.2 or 4.3 which deals with the error messages on sync plug-ins. The corrective action is based primarily on the ERR SYNC COND code. The series of codes beginning with E0 implicate the DPLL pack, the interface with the controller MP, or the SPU power. The E1 series indicates an internal DPLL problem; the E2 series implicates the DPLL and the TB; the E3 series indicates a phase-locked loop problem or input timing problem; and the E4 series indicates a cross-couple problem in which the two syncs are not locked together in phase.



CAUTION:

Never attempt to troubleshoot and replace packs on the in-service side and never take packs from the in-service side for use as replacements for the failed side.

1. Check the printout for RMV ...SYNC message to verify that the failed SYNC was removed from service.
2. If the trouble is found before you reach the end of this procedure, ignore "if trouble persists" steps and go to the end of the portion to restore the sync to service.
3. Which series of COND codes does your ERR SYNC message fall into?
 - If **E2 SERIES**, continue with Step 4.
 - If **E0** or **E1 SERIES**, proceed to Step 9.
 - If **E3** or **E4 SERIES**, proceed to Step 14.

COND E2-- CODES

4. For COND E205, the TB (time base) oven has not reached operating temperature. Wait at least 30 minutes and enter **RST: :SYNC a!** (a = failed sync side). Although the sync can be restored after 30 minutes, it can take up to 2 hours for a stratum 2 sync to reach rated precision.
5. For other COND code or if E205 persists, replace the TB pack and wait for oven to reach operating temperature. Then, enter **RST: :SYNC a!**.
6. If sync failure persists, unplug TB pack and check the slot for broken pins or damaged backplane. Reinstall TB after inspection and allow for warmup time.

7. If no wiring problem is found, replace the DPLL pack and enter **DGN::SYNC a!** for the subject sync side.
8. After the TB ovens have reached temperature (30 minutes), enter **RST::SYNC a!**.

COND E0-- OR E1-- CODES

9. Unplug and reseal the DPLL pack and enter **DGN::SYNC a!**.
10. If failure persists (for original E0-- code trouble), unplug DPLL and check plug-in position for bent pins or damaged backplane. Reinstall DPLL after inspection.
11. If sync failure persists, replace DPLL pack and reenter sync diagnostic.
12. If ERR SYNC ...COND E004 message is received with the failed diagnostic, continue with Step **13**.
 - If the COND E004 message is not received, replace the TB pack for the sync and reenter the sync diagnostic. If the trouble cleared, allow time for the TB ovens to reach temperature (30 minutes) and enter **RST::SYNC a!**.
13. Replace SPU pack for failed sync side and reenter sync diagnostic command.
 - If DGN ...ATP (or CATP) is received, enter **RST::SYNC a!** for the subject sync side (0 or 1) and to clear all power alarms, enter **UTL::CLR,PWR 00!**.
 - If sync failure persists, enter **RMV::MC!**, unplug the same CPU2, and check plug-in position for bent pins or damaged backplane. Reinstall CPU2, enter **RST::MC!** and reenter sync diagnostic.
 - If trouble persists, remove the MC from service, replace the CPU2 in the main controller, and enter restore MC to service.

COND E3-- OR E4-- CODES

14. Replace the DPLL pack and enter **DGN::SYNC a!**.
15. If DGN ...STF message is received, continue with Step **16**.
 - If the message is not received, proceed to Step **22**.

16. Which ERR SYNC ...COND code message do you have?
 - If **COND E3--**, continue with Step 17.
 - If **COND E4--**, proceed to Step 19.
17. Enter **UTL::QRY, STATE, SYNC!** to determine the active SSP. Remove the active SSP on the failed side as follows: **RMV::SYNC a, TLI n, SSP s!**. Enter command to remove the same SSP on the other side.
18. Reenter the sync diagnostic command and watch for the reoccurrence of the sync error.
 - If the trouble was found, enter **RST::SYNC a!**.
 - If the trouble was not found, there is an obscure trouble; contact technical consultant.
19. Unplug the DPLL and check the plug-in position for bent pins or backplane damage. Reinstall DPLL after inspection.
20. If no wiring problem is found, the other sync side may be causing the problem. During nonbusy hours, make attempts to restore the failing sync by entering **RST::SYNC a!**. If the sync will remain in service even for a brief time, enter **DGN::SYNC a!** for the other sync, and repeat this portion of troubleshooting if other side fails.
21. If the trouble was found (or diagnostic passed), continue with Step 22.
 - If the trouble was not found, there is an obscure trouble; contact technical consultant.
22. Enter **RST::SYNC a!**.
23. If TLI-SSP was removed from service (in Step 17), the timing link was probably causing the trouble. Either check or replace the timing link. Enter **RST::SYNC a, TLI n, SSP s!** for both removed SSPs.

Respond to Failed Status for Plug-In

1. To obtain listing of equipped CPs (circuit packs), enter
UTL: :QRY, EQD[, {UNIT [q]q|UNITS|ETSI|TSIS|NPCS}]! See Figure 4-6 for link and CCN/ECCN plug-ins if entire frame is checked.

Where:

UNIT [q]q, UNITS, = Optional, to request the equipage
ETSI, TSIs, NPCs in specific unit or of specific
plug-ins instead of entire frame.

⇒ NOTE:

Equipped CPs are indicated by a "1" alongside the CP or by the CP number in the sequence. For duplicated entities (FC, ETSIs/TSIs), there will be listings for both the zero and one sides for each duplicated plug-ins.

2. To obtain a listing of out-of-service, failed, and pested CPs (see Notes), enter **UTL: :QRY, ALL[, UNIT [q]q]!** where: [q]q = Unit number (1 through 16).

⇒ NOTE:

The conditions are indicated by the presence of a "1" in the respective columns (out-of-service, failed, and pested) for each pack. For duplicated entities (FC, ETSIs/TSIs), there will be listings for both the zero and one sides for each duplicated plug-ins. Unequipped NPCs are indicated by dashes.

⇒ NOTE:

If XON option is selected, you can use CTRL-S and CTRL-Q to stop and start the output.

3. To check only common equipment, enter
UTL: :QRY, {OOS|FAIL|PEST|ALL}, COMMON! and see Figure 4-6 to read the link and ECCN/CCN output.

M...UTL QRY <parameter> g h i j k l m n o p EOM

g = Link 1
h = Link 2
i = Link 3
j = Link 4
k = Link 5
l = Link 6
m = Cross-Connect Side 0
n = Cross-Connect Side 1
o = CCI 0 / CCNI 0
p = CCI 1 / CCNI 1

Figure 4-6. Common Equipment Readout

4. See Note. If any CPs are equipped but out-of-service, enter the RST (restore) command per Figure 4-7 for the pack.
 - If command denial occurs, find the meanings of the condition codes in *Command Denials*.

⇒ NOTE:

When a CP in a duplex/protected network (ECCN/CCN, DSPU, DS3U, HDS3U) fails, service is switched and all the CPs on the failed side/group are removed from service and pested. To correct the problem, the failure must be cleared and the side (or all CPs) can be restored. If both sides/groups are failed, trouble must be cleared on the out-of-service side/group first; removal of the other side will be denied.

5. If any CPs are failed, enter the DGN (diagnose) command per Figure 4-7 for the pack.
 - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear failed diagnostic.
 - If diagnostic passes (ATP or CATP), enter RST command.

6. To check for out-of-service, failed, and pested CPs, enter
UTL:::QRY,ALL[,UNIT [q]q]!.
7. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 4-7.
 - If command denial occurs, find the reason for denial in the output message and perform corrective action to obtain command completion. The *Command Denials* section gives the meanings of the condition codes.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSI,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-7. Maintenance Command Construction

Clear Transient Trouble Using ERROR LOG Message

Overview: All error messages are recorded on the PMEM and can be read on command; transient errors for which the DACS II does not produce autonomous output messages are also recorded. When there is an overload of messages, the frame may report a lot of ERR MSGS messages. FRADTS messages and the autonomous removal of units with a COND D1 (unknown error) may also occur.

1. To get the history of hardware errors, enter
UTL::QRY,ERR,HWER,INT tt! where tt is interval up to 59 minutes ago. It is advisable to start with a small interval (say 1 minute) because a dump of the whole contents could take hours.
2. Familiarize yourself with the ERR message output per Figure 4-8.

M	...	UTL	QRY	ERR	HWER	...	5	LN	MSG										
HOST00xx		ENTT00xx		ERRC00xxxx		ERRTxxxx		TRANxxxx		EVENxxxx									
<data7>		<spare>		<spare>		<data10>		<data11>		<data12>									
<data13>		<data14>		<data15>		<data16>		<data17>		<data18>									

Figure 4-8. General Error History Message Format

3. Refer to Table 4-4 for the meaning of the first 2 data bytes (HOST -host ID and ENTT -entity) and to Table 4-5 for the meaning of data 3 (ERRC -error class).

Table 4-4. Host ID and Entity

Host	Meaning	ENTT	Meaning
0000	UC1 error	1	unit UC
0001	UC2 error	2	UBX
0002	UC3 error	3	EBX
0003	UC4 error	4	FTMI
0004	UC5 error	5	FC
0005	UC6 error	6	DDC
0006	UC7 error	7	DSPI
0007	UC8 error	8	DMB
0008	UC9 error	9	CCNI
0009	UC10 error	a	CCB
000A	UC11 error	b	TSI
000C	UC13 error	d	EMTC
000D	UC14 error	e	Sync
000E	UC15 error	f	TLI
000F	UC16 error	10	Timing Link
0010	CI error	11	PMEM
0011	MP error	12	SMEM
0012	CCN error	13	MP
0013	Frame error	14	CI
0014	Local error	15	LINK
0015	Unknown error	16	NPC
0016	MC error	17	MC
0017	PMEM error	18	MJU
0018	SMEM error	19	SRM
		1a	DS3U MXR
		1b	DS3U FLI
		1c	DS3U FMT
		1d	DS3U MIU
		1e	PR
		1f	EMTC
		20	EBX
		21	CCI
		22	ETSI

Table 4-5. Error Class Meanings

Code	Meaning
1	Hardware error
2	Transient error
3	Power error
4	Sanity bit error
5	CI link errors
6	Sync mode switch
7	Software error recovery
8	Error not found
9	Sync booted
A	Sync timing link errors
B	Background audits
C	Facility errors
D	Hardware error detected by application software

4. Use data 10 (or data 13 for DSPU NPC) to identify the hardware entity as follows:
- For a duplicated unit entity, the left half (4 digits) of data 10 gives the unit number (0 through 5 for units 1 through 6) and the right half gives the module (0 through 3 for FTM 1 through 4).
 - For an ETSI entity, the left half (4 digits) of data 10 gives the side (0, 1) and the right half gives the unit (0 through F for units 1 through 16).
 - For an FTU NPC entity, the left half (4 digits) of data 10 gives the unit number (0-5 for units 1 through 6) and the right half gives the NPC number in HEX. To get the NPC number, convert the HEX number to decimal and add 1 (see Figure 4-9 and Table 4-6).
 - For a DSPU NPC entity, the left half (4 digits) of data 13 gives the side (0, 1) and the right half gives the NPC number in HEX. To get the NPC number, convert the HEX number to decimal and add 1 (see Figure 4-9).
 - If ERRC=d then data 10 will correspond to an ASCII text file name. For Example:

```

ENTT0016 - npc
ERRC000d
Byte 10 BYTE11 BYTE12
55434650 706274 72 65732E63
UCFP pbtr eb.L

```

Powers of 16 = $16^3 16^2 16^1 16^0$
Example: Hex = 005A
Decimal Number = (0×16^3)
 $+ (0 \times 16^2)$
 $+ (5 \times 16^1)$
 $+ (A \times 16^0)$, where $16^0 = 1$
0s = $(0 \times 0) = 0$
5 = $(5 \times 16) = 80$
A = $+ (A \times 1) = 10$, where **A** = 10
Decimal Number = 90
(NPC Number = 90 + 1 because internal count started with 0)
Hex Characters: = A = 10, B = 11, C = 12, D = 13, E = 14, F = 15

Figure 4-9. Hexadecimal-to-Decimal Conversion Example

Table 4-6. Hexadecimal Numbers

(1) 01	(21) 15	(41) 29	(61) 3D	(81) 51	(101) 65	(121) 79	(141) 8D
02	16	2A	3E	52	66	7A	8E
03	17	2B	3F	53	67	7B	8F
04	18	2C	40	54	68	7C	90
05	19	2D	41	55	69	7D	91
06	1A	2E	42	56	6A	7E	92
07	1B	2F	43	57	6B	7F	93
08	1C	30	44	58	6C	80	94
09	1D	31	45	59	6D	81	95
(10) 0A	(30) 1E	(50) 32	(70) 46	(90) 5A	(110) 6E	(130) 82	(150) 96
0B	1F	33	47	5B	6F	83	97
0C	20	34	48	5C	70	84	98
0D	21	35	49	5D	71	85	99
0E	22	36	4A	5E	72	86	9A
0F	23	37	4B	5F	73	87	9B
10	24	38	4C	60	74	88	9C
11	25	39	4D	61	75	89	9D
12	26	3A	4E	62	76	8A	9E
13	27	3B	4F	63	77	8B	9F
(20) 14	(40) 28	(60) 3C	(80) 50	(100) 64	(120) 78	(140) 8C	(160) A0

5. Find the meaning of the condition code given in data 4 (ERRT) from Table 4-7 or Table 4-8 in Section 4.7.

**NOTE:**

The CCI and ETSI errors are interactive; errors on one will affect the other. If most of the ETSIs for a unit are reporting errors, the common CCI for the unit has probably failed. If a CCI is reporting errors, one of the connecting ETSIs may have failed.

6. Enter command to remove the entity from service per Figure 4-10.
7. Enter command to diagnose same pack per Figure 4-10.

**NOTE:**

Attempt to clear pested packs on the same side before working on the other side. Only, if both sides are pested, you will need to bring the entire side up to service before attempting restoral of any failed or pested packs on the other side.

8. If DGN ...STF message is received, then go to *Manual Diagnostic Failures* to clear failed diagnostic.
 - If the message is not received, continue with Step 9.
9. Replace the plug-in for the subject entity (or other replacements per Section 4.7) and enter commands to restore replacement packs to service per Figure 4-10.
10. If same transient messages are recorded again in error history on PMEM, contact technical consultant.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sfl!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-10. Maintenance Command Construction

Isolate Trouble with ERR COND Code Meanings

1. From Table 4-7 or Table 4-8, find the explanation of the COND code which appears in the ERR,ESR message for the subject pack.
2. If you were able to clear the trouble using the meaning of the ERR code, go to Step 4.
 - If you were not, continue with Step 3.
3. Check printout for ERR SOFTWARE message.
 - If ERR SOFTWARE message also occurs in printout, go to *Software Error*.

4. To make a record of the error history on the PMEM (for use by technical consultant), enter one of the following commands (see Note):

Time of Day/Time Interval:

UTL : : QRY, ERR, HWER, {INT mn} [DATE mmddyy,] TOD hhmmss} !

Suspect Entity:

UTL : : QRY, ERR, HWER, ENTY eee !

Where:

INT = Interval of time (past 59 minutes)

TOD = Time of day consisting of hour (hh=00 through 23), minutes (mm=00 through 60), seconds (ss=00 through 60). Date (month, day, year) is optional.

eee = Plug-in designation, for example: BX, CCB, CCI, CCNI, FC, FTMI, LINK, MC, MP, MTC, NPC, SYNC, TLI, TSI, UBX, UC.

⇒ NOTE:

All error events are logged on PMEM; however, the file is overwritten when the file capacity is reached. If you do not know how full the error log is (not recently cleared), you will want to use a short interval, perhaps the past 5 minutes, to avoid overloading the link with old errors.

5. Contact technical consultant.

Table 4-7. ESR Condition Codes - CCNI,CCB,TSI

CCNI Pack	
COND 90	Software could not access CCNI; pack does not acknowledge. Corrective Action: (1) verify that CCNI is securely seated; (2) look for loss of sync to CCNI and replace CCNI; (3) look for MC, BX or CPU interface trouble.
91	RAM error in high data byte on MC-MP. Trouble in MC (BX or CPU), or CCNI.
92	RAM error in low data byte on MC-MP. See COND 91.
93	Address parity error. Corrective Action: enter command to restore CCNI.
94	Autonomous switch error. Circuit in CCNI for side switch independent of MP disagrees with mate CCNI.
95	Bus status error. Circuit cannot determine active side. Corrective Action: (1) replace CCNI; (2) if persists, report possible software error.
96	Stuck summary bit. Error leads from CCB or TSI stuck high, but no trouble can be found. Subject CCB and TSI packs are identified in messages.
CCB Pack	
COND A0	Software could not access CCB; pack does not acknowledge. Corrective Action: (1) verify that CCB is securely seated; (2) look for loss of sync to CCB and replace CCB; (3) look for MC, BX or CPU interface trouble.
A1	Loss of sync pulse signal for approx. 100 ms. Trouble in CCB or SYNC or sync interface between.
A2	Loss of 8 MHz clock. See COND A1.
A3	Bad data from TSI ports. If most ports are reported in ESR, probably the CCB is bad. If only a few ports are reported, probably the TSIs are bad.
A4,A5	Zero bit stuck at 1 in CCB (A4) or CCNI (A5).
TSI Pack	
B0	Software could not access TSI; pack does not acknowledge. Corrective Action: (1) verify that TSI is securely seated; (2) look for loss of sync through CCB and replace TSI; (3) look for MC, BX or CPU interface trouble.
B1	Stuck summary bit that indicates troubles from TSI devices, but no actual trouble can be found.
B2	TSI device error that clears during recovery; transient error.
B3	Software could not access TSI device; device failed or lost sync clock.
B4	Diagnostic exercise bits set on TSI device. Replace TSI.
B5	Error on address bus to TSI device. Trouble in TSI, CCNI, or MC-BX pack.
B6	TSI device not receiving good sync clock. Trouble in TSI, related CCB, or SYNC.
B7	Error on TSI control RAM which defines maps. Replace TSI.
B8	Parity error on port from FC or DSPU-DMB. If most all TSI ports are reported in ESR message, replace TSI. If isolated ports are reported, the FCs or DMBs are probably bad. Adjacent NPCs that share the DBM ports will be reported although only one is bad.
B9	Parity error from CCNI.

Table 4-8. ESR Condition Codes**MC-CI Pack**

COND D0	RAM parity error.
D5	Illegal/unknown condition code.

MC-MP Pack

COND D0	RAM parity error.
D5	Illegal/unknown condition code.
2E	Unused bit error.
2F	Unknown error source.
30	Power failure.
31	Processor not sane.
Corrective Action: verify that MP pack is securely seated.	

MC-MTC Pack

COND D5	Illegal/unknown condition code.
2B	Unknown interrupt from MTC.
2C	Stuck summary bit.
2D	Unused bit error.
30	Power failure.
31	Pack no same.

MC-EBX Pack

COND D5	Illegal/unknown condition code.
16	Write RAM parity error, low byte.
17	Write RAM parity error, low byte.
18	RAM parity, CPU-EBX.
19	D9 bit error.
1A	D10 bit error.
1B	D11 bit error.
20	Access error.
Corrective Action: (1) verify that EBX is securely seated;	
(2) replace EBX pack.	
21	RAM parity error, low byte.
22	RAM parity error, high byte.
23	Fan Bank 0 error flag.
24	D5 spare bit error.
25	Fan Bank 1 error flag.
26	D5 spare bit error.
27	Stuck summary bit.
28	Unknown interrupt.
29	Error from side 0 bus extension.
2A	Error from side 1 bus extension.

Continued on next page

Table 4-8. Continued

Unit-UC or UBX Pack (Types UA, UD, UC)	
COND 10	CPU parallel bus parity error.
11	CPU serial bus parity error.
0F	CPU internal bus error.
31	Unit UC is not sane.
	Corrective Action: verify that unit CPU is securely seated.
D0	Unit UC has RAM parity error.
	Corrective Action: replace unit CPU.
D1	Unknown error.
D2	Error source not found.
D3	Stuck bit in register on the pack.
D4	Failed UBX pack.
	Corrective Action: replace UBX pack.
D5	Invalid condition code.
30	Power failure.
FTMI Pack	
COND D5	Illegal/unknown condition code.
40	Error detected on bus from FTMI. Trouble either in FTMI, UBX, or MC-CPU.
41	Communications device (CIA) error.
42	Communications device (CIB) error.
43	Communications device (CIC) error.
44	Software could not access FTMI; pack does not acknowledge.
	Corrective Action: (1) verify that the FTMI is securely seated;
	(2) verify that FCs are securely seated and not failed;
	(3) verify that CCIs and ETSIs for unit are securely seated and not failed.
45	Loss of sync clock from UBX.
46	Device ID disagreement.
47	Data strobe signal.
48	Address parity error.
	Corrective Action: enter command to restore FTMI.
49	Stuck bit on port from FC. If most of the ports are listed in ESR, the FTMI is probably bad.
	If isolated ports are reported, an FC is probably bad.
4A	Stuck bit on port from NPC. If most of the ports are listed in ESR, the FTMI is probably bad. If isolated ports are reported, an FC is probably bad.
4B	All FTMIs have lost sync clock. Trouble on related CCB or SYNC.

Continued on next page

Table 4-8. Continued

FC Pack	
COND D5	Illegal/unknown condition code.
4C	Software could not access FC; pack does not acknowledge. Corrective Action: (1) verify that FC is securely seated; (2) look for loss of sync from CCIs and ETSIs and replace FC; (3) look for unit UBX or UC trouble.
4D	Pack timer error.
4E	Circuit ID error.
4F	Transmit formatter error on ports from NPCs. If most of the ports are listed in ESR, the FC is probably bad.
50	Receive formatter error on ports from NPCs. Corrective action: (1) Restore FC; if restore denies, replace pack. (2) If FC is removed again and NPC is implicated in message, replace NPC.
51	Sanity timer interrupt.
52	RF bus error.
DS3U MXR Pack	
COND 14	DS3 loss of signal.
15	Unknown error.
34	M23 summary register stuck bit.
97	Communications link error.
A6	Chan controller transmit data error.
A7	Chan controller receiver data error.
A8	Chan controller exercise error.
A9	Chan controller register stuck bit.
AA	Transceiver framer error.
AB	Transceiver receive sync error.
AC	Transceiver transmitter error.
AD	M23 device error.
AE	M12 device error.
AF	M12 summary stuck error.
D5	Illegal/unknown condition.
D8	MXR ROM error.
D9	MXR LCA error.
DA	MXR queue overflow.
DB	Chan controller loss of clock.
DC	Chan controller frame sync error.
DD	Chan controller config register error.
DE	Chan controller instruction RAM error.
DF	Chan controller parity error.

Continued on next page

Table 4-8. Continued

FTU-NPCs (Common for DPCs and DDCs)	
COND 53	DDC bus error.
54	Software could not access NPC; pack does not acknowledge. Corrective Action: (1) verify that NPC is securely seated; (2) check loss of sync from FC; (3) check unit UBX or UC trouble; (4) if persists, replace NPC.
55	NPC is sending a port alarm to the FC.
56	Facility processor on NPC is not sane.
57	SYNC error on FC.
58	Loss of sync clock to channel controller.
59	Loss of frame sync error to channel controller.
5A	Channel controller configuration error.
5B	Channel controller RAM error. Corrective Action: enter command to restore NPC.
5C	Channel controller parity error. Corrective Action: enter command to restore NPC.
5D,5E	Channel controller transmit (5D) or receive (5E) error.
5F	Channel controller exercise error.
60	Channel controller summary bit error.
61	Hard RAM error.
62	Hard ROM check error.
63	Hard error stuck bit.
64,67	Transceiver A (64) or B (67) stuck bit.
65,68	Transceiver A (65) or B (68) transmit slip.
66,69	Transceiver A (66) or B (69) error.
6A	Circuit ID error.
6B	Facility errors.
6C	DDC address parity error.
6D	Invalid FPA state.
6E	Invalid DDC pack ID.
D5	Illegal/unknown condition.
DSPU NPC - MJU	
	Corrective Action for COND BF-C7: replace MJU (subject side).
COND BF	Serial access error.
C0	Clock error.
C1	Processor interface error.
C2	Input data interface error.
C3	Error correction circuitry failure.
C4	Control memory failure.
C5	Output block failure.
C6	Sampling circuitry failure.
C7	Control memory or state machine failure.

Continued on next page

Table 4-8. Continued**DSPU NPC - SRM**

COND C8	Corrective Action for COND C8-CF: replace SRM (subject side).
C9	Serial access error.
CA	Clock error.
CB	Processor interface failure.
CC	Input data interface failure.
CD	Error correction block failure.
CE	Control memory failure.
CF	Multiplexer block failure.
	Output block failure.

FTU NPC - CEPT DPC

COND 3D	ROM error.
3C	TS0 monitoring overflow.
3E	Loss of timing.
3F	OOS test ran while pack was in service.

DSPU-DSPI

COND 6D	Software could not access DSPI; pack does not acknowledge. Corrective Action: (1) verify that DSPI is securely seated; (2) look for loss of sync from UBX and replace DSPI; (3) look for unit CPU trouble.
6E	Bus parity error. Trouble either on unit CPU or DSPI.
6F	Bus address parity error.
D3	Corrective Action: enter command to restore DSPI. Stuck bit on unit CPU, but no ESR bits set on DSPI.

CPR Packs

COND 98	CPR serial access error.
99	CPR clock error.
9A	CPR processor interface failure.
9B	CPR input data interface failure.
9C	CPR D-bit interface parity error.
9D	CPR control memory failure.
9E	CPR control memory or state machine failure.
9F	CPR FIFO FRDY/FFULL stuck bit.

Continued on next page

Table 4-8. Continued**DSPU NPC - DMB**

COND 70	Software could not access DMB. Corrective Action: (1) verify that DMB is securely seated; (2) check clock loss from DSPI; (3) replace DMB; and (4) replace DSPI.
71	No reply on serial interface bus to NPC pair.
72	No reply on parallel interface bus to NPC pair.
73	Diagnostic exercise bits for DMB set on DSPI. If error persists after DSPI replacement, report possible software trouble.
74	DMB data processing error.
75	Multiple data parity error; however, check bit in DMB not set. Corrective Action: replace associated unit ETSI pack.
76	Sync clock error. Trouble in NPC or associated unit ETSI.
77	Sync clock error on multiple DMBs. Trouble in associated unit ETSI or the SYNC.
78	DMB FIFO error.
79	Power failure on DSPU side.
7A,7B	Transient error on control memory 0 (7A) or mem 1 (7B).
7C,7D	RAM parity error on control memory 0 (7C) or mem 1 (7D).
7E,7F	Interface error on control memory 0 (7E) or mem 1 (7F).
80,81	Loss of sync on control memory 0 (80) or mem 1 (81).
82,83	Input data parity error on control memory 0 (82) or mem 1 (83).
84,85	Transient on conferencer 0 (84) or conferencer 1 (85).
86,87	Control interface error on conferencer 0 (86) and 1 (87).
88,89	Control RAM parity error in control data or configuration field for conferencer 0 (88) or conferencer 1 (89).
8A,8B	Input data parity error on conferencer 0 (8A) or 1 (8B).
8C,8D	Parity, configuration, or reset error on conferencer 0 (8C) or conferencer 1 (8D).
8E,8F	Bit alarms on control memory 0 (8E) or mem 1 (8F).
D5	Illegal/unknown condition.

CCI Pack

COND 01	Software could not access CCI. Corrective action: (1) verify that CCI is securely seated; (2) look for loss of clock (3) replace CCI; and (4) check MC, EBX, or CPU interface trouble.
02	Incorrect version number on CCI.
03	Summary bit set, but no other errors.
04	CCI ERR bit set in system status register.
05	ETSI ERR bit set in system status register.
06	Peripheral unit bit set in system status register.
07	Bus terminator pack absent.
08	2-MHz clock out of phase-lock.
09	240 frame sync misaligned.
0A	Loss of 240 frame sync.
0B	Loss of 8-kHz frame sync.
0C	CCI detected address parity error.
0D	CCI detected low byte data parity error.
0E	CCI detected high byte data parity error.
0F	CCI -5.2 power supply failure.
10	CCI detected bus status parity error.
11	Peripheral unit alarm.
12	Sync summary bit set on CCI pack.

Continued on next page

Table 4-8. Continued

ETSI Pack	
COND 20	Software could not access ETSI; pack does not acknowledge. Corrective Action: (1) verify that ETSI is securely seated; (2) look for loss of sync to ETSI and replace ETSI; (3) look for MC, EBX, or CPU interface trouble.
21	Incorrect version number on ETSI pack.
22	Summary bit set, but no other errors.
23	Loss of 32.768-MHz clock.
24	Loss of 240 frame sync.
25	Receive MDX summary bit set.
26	Control RAM summary bit set.
27	Transmit MDX summary bit set.
28	Loss of 3.3-volt power from CCI pack.
29	Peripheral unit port alarm (receive MDX).
2A	Receive MDX data source time-slot parity error.
2B	Receive MDX sync error.
2C	Receive MDX address parity error.
2D	Receive MDX write data parity error.
2F	Receive cannot be accessed; incorrect chip ID.
30	Transmit MDX data parity error.
31	Transmit MDX data source time-slot parity error.
32	Transmit MDX sync error.
33	Transmit MDX address parity error.
34	Transmit MDX write data parity error.
35	Transmit MDX cannot be accessed; incorrect chip ID.
37	Control RAM parity error.
38	Control RAM sync alarm.
39	Control RAM port alarm.
3A	Control RAM BIST flag is set.
3B	Data RAM BIST flag is set.
3C	Control RAM address parity error.
3D	Control RAM write data parity error.
3E	Control RAM device cannot be accessed; incorrect chip ID.
3F	Control RAM circuit pack parity.
40	Control RAM device is in reset state.
41	Control RAM port alarm summary bit set.
42	TRD3 status exercise bit is set.
43	Ready high error detected from CCI.
44	Ready timeout error from CCI; CCI cannot access ETSI.
45	Control RAM stuck bit error.

Continued on next page

Table 4-8. Continued

SYNC Packs	
COND 96	Transient error on sync pack.
D5	Illegal/unknown condition.
E000	Gross SYNC error registered at CCI. Communications with SYNC failed. Corrective Action: check if SYNC plug-ins have been disconnected.
E001	SYNC reports bad DPLL pack to error recovery.
E002	SYNC reports bad TB pack to error recovery.
E003	SYNC restarted itself autonomously.
E004	Software could not communicate with SYNC. Trouble with SYNC or in MC-MP.
E100	Transient caused by MP to SYNC communications failure. This error also brings E004 and remove SYNC.
E101	SYNC ROM checksum failure.
E102	SYNC RAM data or address error.
E103	SYNC has phase/freq. output latch error.
E104	Loss of 2.048 MHz output from frequency synthesizer.
E105	Loss of 2.048 MHz output from phase shift circuit.
E106	Loss of generated sync pulse output.
E107	Loss of time base strobe pulse.
E108	SYNC interrupt controller error.
E109	SYNC interrupt holding register error.
E10A	SYNC UART error.
E10B	SYNC control data output latch error.
E200	Unknown TB transient error; brings E004 message and RMV SYNC.
E201	Loss of output from TB.
E202	SYNC could not read TB pack ID or oven temperature.
E203	For MASTER timing, SYNC finds its TB has drifted out of limits.
E204	Ovens in both SYNC TBs are cold.
E205	New TB pack oven has not reached temperature. For Stratum 3, message appears once, though subsequent restorals will fail until temperature is reached. For Stratum 2, the message is repeated.
E300	Unknown PLL transient error; also brings E004 and RMV SYNC.
E301	One or both SYNCs report that PLL remains at end of range for 1 minute. If both SYNCs report the TLI is removed. If one reports, that SYNC is removed.
E302	Reporting SYNC finds excessive phase error (125 μ out of phase).
E303	Reporting SYNC found PLL violations.
E304	Noise on timing link caused PLL to go from fast start to normal mode.
E305	Accompanies E301 to declare timing link (SSP) failure.
E400	Unknown mate SYNC transient; also brings E004 and RMV SYNC.
E401	Reporting SYNC found bad mate. Mate declared out-of-service; ESR bits are from reporting SYNC.
E402	One SYNC communicated failure to reporting SYNC. ESR bits are from reporting SYNC.
E403	One SYNC communicated loss of cross-coupling for 1 millisecond to reporting SYNC. ESR bits are from reporting SYNC.

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Table 4-8. Continued

SYNC Packs (contd)	
COND E404	One SYNC communicated loss of cross-coupling for 30 msec. See E403.
E405	Communication link with mate is down. ESR bits are from reporting SYNC.
E406	Cross-coupling violation that indicates trouble with mate rather than DPLL. ESR bits are from reporting SYNC.
E407	Cross-couple fast lock circuit failed to align phase of two syncs.
E408	For MASTER timing, the TB in the mate SYNC has drifted out of limits.
E409	One SYNC communicated loss of cross-couple lock to reporting SYNC.
E500	Transient TLI error; no further communication. Brings E004 message and RMV SYNC.
E501	TLI hardware error as defined by the ESR message bits. For TE type, one or both SSPs may be effected.
E600	Unknown SSP error; no further communication. Brings E004 message and RMV SYNC.
E601	Subject SSP has errors and cannot be used as timing source. Error brings diagnostic on SSP. Trouble either on incoming link or in TLI-SSP.
E602	Subject TLI-SSP was found to be cause of errors and was removed from service.
E603	Incoming unipolar clock does not match frequency field requirements defined in ESR message bits.
E700	Unknown CRO error; no further communication. Error brings E004 message and RMV SYNC.
E701	Loss of CRO clock signal.
E702	Loss of CRO clock signal. If one SYNC declares error, trouble is probably TB or DPLL. If both declare error, trouble is probably CRO which will be removed.
E703	SYNCs report that CRO has drifted out of limits.
E704	SYNC declared that CRO is out-of-service.
E800	Unknown clear message.
E801	Mate error cleared.
E802	PLL error cleared.
E803	TB error cleared.
E804	CRO error cleared.
E805	Timing link error cleared; link can once again be used as source. Error brings diagnostic and updated link status.
E806	TLI error cleared.
EF00	Transient unknown SYNC side switch error. Error brings E004 message and RMV SYNC.
EF01	SYNC changed to NORMAL mode and is on named SSP source.
EF02	SYNC changed to HOLDOVER mode and is on internal osc.
EF03	SYNC changed to FAST START and is on named SSP source.
EF04	SYNC switched to different TLI for timing source.
EF05	SYNC changed to CROSS-COUPLE and derives timing from mate.

Clear ERR HARDWARE Message

1. Notice which plug-in is named in the ERR HARDWARE message in the field after the HARDWARE keyword. Also check for error code or further explanation in the message.
2. Study the associated messages to determine if the subject plug-in has been removed and diagnosed.
3. Check for a blown fuse on the 48-volt fuse and alarm panel and on the frame fuse boards. Also check for ERR PWR message (for failed power unit) in printout.
 - If there is a blown fuse, go to *Power Failures* to clear the blown fuse trouble.
 - If there is a failed power unit, go to *Power Failures* to clear the failed power unit.
4. Which of the following codes/explanations are given in the ERR message?
 - If **Code E1**, then continue with Step 5.
 - If **Code E2**, then proceed to Step 8.
 - If **Code E3**, then proceed to Step 10.
 - If **other code**, then proceed to Step 12.
 - If **no code or explanation**, check trouble printout for associated trouble messages. If you cannot identify the trouble using printout and the *Trouble Identification* section, contact technical consultant.
5. Hardware does not match inventory in data base or there is a hardware failure. Enter following command and check if correct equipment code plug-ins are installed for sync or NPC plug-ins that have growth specifications.
UTL : : QRY, ALL [, UNIT [q]q] ! where UNIT field limits NPC information to one unit.

⇒ NOTE:

The conditions are indicated in the output message by the presence of a "1" in the out-of-service, failed, and pested columns for each pack. Unequipped NPCs are indicated by dashes.

- If incorrect plug-in installation was found and if the plug-in named in message was removed from service, enter RST command for CP per Figure 4-11. This procedure is completed.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sf!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSISs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 4-11. Maintenance Command Construction

6. If plug-in named in message was not removed from service and diagnosed, enter the **RMV** and **DGN** commands for the CP per Figure 4-11.
 - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear the failed diagnostic.
7. Enter RST command for plug-in.
 - If trouble persists, contact technical consultant.

For Code E2, Continue Here

8. Software could not access subject pack. Verify that the pack is installed.
9. If the subject pack has not been diagnosed, enter DGN command to diagnose pack per Figure 4-11.
 - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear the failed diagnostic.

For Code E3, Continue Here

10. Hardware boot failed. If the subject pack has not been removed from service, enter RMV command to remove pack per Figure 4-11.
11. Enter RST command to restore same pack to service per Figure 4-11.
12. Find expanded explanation in Table 4-9 and perform corrective action. Refer to Figure 4-11 for command construction. Remember to enter commands to remove pack before replacing, and restore after replacing.
 - If you were not able to find the trouble, check trouble printout for associated trouble messages. If you cannot identify the trouble using printout and the *Trouble Identification* section, contact technical consultant.

Table 4-9. Error Hardware Explanations

Code	Explanation/Corrective Action
E0	Hardware and data base do not agree. Check associated ERR ESR message for named plug-in (hardware).
E1	Attempt to write to named pack failed.
E2	Attempt to boot (reset or restore) pack failed.
E3	X.25 layer 3 protocol failure; far end is not transmitting or responding. Check on far-end equipment or software failure.
E4	For X.25 link, there is a layer 1 (clear-to-send) failure; check link cabling and connections. For Snider link, there is a possible CI (DUART circuit) failure; enter DGN : : LINK ! and replace CI to clear failure.
E5	X.25 layer 1 or 2 protocol failure; far-end is not transmitting or responding. Check far-end equipment or software failure.
E6	Software failure forced link out-of-service. Enter RST : : LINK j !
E7	Unit could not be reset for boot. Enter appropriate RMV command (UNIT [q]q, UC or MC), replace CPU (in UNIT) and MTC (in MC), and restore pack. Check unit to MC cabling.
E8	Unit failed sanity check for boot. Enter remove UNIT UC , replace CPU in unit, and restore pack.
E9	NPC failed to insert trunk conditioning. Enter DGN : : NPC ! Remove and replace if necessary.
EA	NPC failed to remove trunk conditioning. Remove and replace NPC.
EB	Failure to verify ECCN side switch. Enter DGN : : CCI s ! for each side. If no failure is found, enter commands to remove and restore each CCI to reestablish active side.
EC	NPCs/facilities hardware error overflow. Check for DS3 or multiple facility failures or all NPCs in unit failing because of common equipment.
ED	Duplex entity failed. On side (for plug-in) that was autonomously removed from service, replace failed plug-in, and enter restore command.
EE	Lost clear-to-send signal on X.25 links.
EF	Frame audit reboot DDC failure.

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This chapter contains the procedures to clear failed diagnostic tests on the DACS II circuit packs or circuit groups. The failed diagnostic will be reported as a result of a manual entry of the diagnostic command or autonomous error recovery operation. A failed diagnostic is always indicated by the STF keyword in the message.

⇒ NOTE:

If you already have isolated the trouble to a failed diagnostic, proceed directly to the procedure for that failed diagnostic; otherwise, go to *Trouble Identification* to first isolate the trouble.

The following equipment considerations pertain to the diagnostic tests:

- The diagnostic for a plug-in specifically tests that plug-in, and the plug-in itself is always the first one implicated by the failure.
- The diagnostic tests are run as part of the command to restore the plug-in to service.
- The diagnostics for facility NPCs include loopback tests which check the internal transmission paths (except line transformers) and tests which checks the facility error detecting circuits.
- With the CEF (capacity expansion frame), diagnostic tests for various plug-ins also include cabling tests. The FC and DSP NPC diagnostics check wiring between the unit and the ECCN. The unit UC diagnostic checks wiring between the unit and the FC. The ETSI diagnostic sources and reads time slots in and out of the ECCN bus.

Clear Failed MC Diagnostic

1. If alarm cutoff is needed, enter **UTL::ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Locate the diagnostic trouble number that appears immediately after the STF word in the output message.
3. On CEF frame, if the trouble number is 0C00, check if the CCI packs are installed in both sides of the network.
 - If the packs are not installed, clear the trouble by installing and restoring the CCI packs, using the command **RST::CCI s!** (s = Side 0 or 1).
 - If the MC (main controller) was removed from service (RMV MC ...COMPL), proceed to Step 7.
4. If trouble number is in the range from 0100 to 0500, enter the diagnostic command for the implicated plug-in per Table 5-1 and refer to the trouble procedure for the failed diagnostic.
5. If an RMV MC ...COMPL message did not accompany the DGN MC ...STF message, enter **RMV::MC!** to remove the MC from service.
6. If the trouble number is greater than 0500, replace the pack implicated by the diagnostic trouble number per Table 5-1.

Table 5-1. Implicated MC Plug-Ins

Trouble Number	Implicated CP	Diagnostic	Reference
0100	MP	DGN::MP!	Section 5.2
0200	CI	DGN::CI!	Section 5.3
0400	PMEM	DGN::PMEM!	Section 5.15
0500	SMEM	DGN::SMEM!	Section 5.16
0600, 0700, 0800, or 0900	EMTC/MTC	None	None
0A01, 0A02, 0A03, 0A04, 0A05, or 0C00	EBX/BX2	None	None
0B00, 1000	EBX/BX2 or CCI (active side)	None	None

7. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

**NOTE 1:**

The terminal must be set to the default baud rate (1200 baud) to see the information as it scrolls on the screen.

**NOTE 2:**

The RESET activity in this step initializes the components in the MC and boots the unit controllers and frame memories with data from the PMEM (or from SMEM if the PMEM cannot be used). The reset sequence begins with the startup diagnostics of the CI, MP, and continues with the boot. It may take several minutes for the reset to complete depending on the size of the frame; a BOOT IN PROGRESS message will be output every 20 seconds during the boot routine.

**NOTE 3:**

If the unit controllers and frame memories are booted with data from the SMEM, the MC will be in MCOND and no database will be present. The SMEM only supplies executables when the PMEM cannot be used for booting.

- If RESET...COMPL (with no COND) message is received, this procedure is completed.
 - If RESET...COMPL (with COND) message is received, go to *Data Base Troubles* to clear conditional reset completion.
8. Enter **DGN : :MC!**
 - If DGN MC ...STF message is received, contact technical consultant.

Clear Failed MP Diagnostic

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Find the diagnostic trouble number that is located immediately after STF in the message.
3. If the MC (main controller) has not been removed from service (as shown by previous RMV MC COMPL or RST MC DNY in printout), enter **RMV : :MC!**.

⇒ NOTE:

If the remove command is entered and the MC is already out of service, the RMV COND 04 DNY message will be received.

4. Replace the CPU2 (code TM778) located in the MC.
5. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

⇒ NOTE 1:

The terminal must be set to the default baud rate (1200 baud) to see the information as it scrolls on the screen.

⇒ NOTE 2:

The RESET activity in this step initializes the components in the MC and boots the unit controllers and frame memories with data from the PMEM (or from SMEM if the PMEM cannot be used). The reset sequence begins with the startup diagnostics of the CI, MP, and continues with the boot. It may take several minutes for the reset to complete depending on the size of the frame; a BOOT IN PROGRESS message will be output every 20 seconds during the boot routine.

⇒ NOTE 3:

If the unit controllers and frame memories are booted with data from the SMEM, the MC will be in MCOND and no database will be present. The SMEM only supplies executables when the PMEM cannot be used for booting.

- If STARTUP STF message is received in the reset sequence, follow the same sequence to replace the CPU2.

- If RESET ...COMPL (with no COND code) message is received, you have completed this procedure.
 - If RESET ...COMPL (with COND code) message is received, refer to *Data Base Troubles* to clear conditional reset completion.
6. If trouble persists, contact technical consultant for assistance.

Clear Failed CI Diagnostic

1. If the alarm cutoff is not already operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the MC (Main Controller) has not been removed from service, enter **RMV : :MC!**.

⇒ NOTE:

If the remove command is entered and the MC is already out of service, the RMV COND 04 DNY message will be received.

3. Replace the CI (TM658C), ECI (TM736C), or HECI (TM762), whichever is installed, circuit pack with the same circuit pack code.
4. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

⇒ NOTE 1:

The terminal must be set to the default baud rate (1200 baud) to see the information as it scrolls on the screen.

⇒ NOTE 2:

The RESET activity in this step initializes the components in the MC and boots the unit controllers and frame memories with data from the PMEM (or from SMEM if the PMEM cannot be used). The reset sequence begins with the startup diagnostics of the CI, MP, and continues with the boot. It may take several minutes for the reset to complete depending on the size of the frame; a BOOT IN PROGRESS message will be output every 20 seconds during the boot routine.

⇒ NOTE 3:

If the unit controllers and frame memories are booted with data from the SMEM, the MC will be in MCOND and no database will be present. The SMEM only supplies executables when the PMEM cannot be used for booting.

5. Early in the reset sequence, if CI STARTUP ATP message is received, continue with the Step 6.

- If CI STARTUP ATP message is not received, check CI/ECI slot and backplane for damage. If no wiring problem is found, contact technical consultant for assistance.
6. During the sequence, if STARTUP STF is received for MP, refer to Section 5.2.
 - If STARTUP STF is not received, continue with Step 7.
 7. If MC RESET COMPL (with no COND code) is received, you have completed this procedure.
 - If MC RESET COMPL (with COND code) is received, refer to *Data Base Troubles* to clear reset completed conditionally.

Clear Failed Sync Diagnostic

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.

**CAUTION:**

Never attempt to troubleshoot and replace packs on the in-service side and never take packs from the in-service side for use as replacements for the failed side.

2. If the SYNC has not been removed from service (RMV SYNC COMPL or RST SYNC DNY in printout), enter **RMV : :SYNC a!**

Where: a = Sync side (0 or 1).

3. If SYNC ESR ...E001 message is found in connection with failed sync, disengage and reinsert the DPLL pack (on the same side as failed sync) for the sync and proceed to Step 17.

- If ESR ...E001 message does not occur, continue with Step 4.

4. If required to prevent circuit noise (see Note), enter commands to remove all unit FCs **on the same side** as follows: **RMV : :UNIT [q]q,FC sb!** for all units (q) and modules (1through 4) in each unit. The FC number (sb) consists of the side and the unit module.

**NOTE:**

If a series G2 backplane (printed wiring) is used for the FTU or if CN 00118.1mv has been implemented on the G1 backplane (hard wiring), it is not necessary to remove the FCs before replacing sync packs. The CN (change notice) involved adding a wiring termination board to the FTU backplane.

**CAUTION:**

Be sure to unplug packs from the inactive side because unplugging FC packs on the active side of the network will cause loss of service in the unit.

5. Unplug the same FCs that were previously removed from service.
6. Replace DPLL pack (TM590 code) for the sync side named in failed sync message. The TLIs are not implicated by this failure; separate messages occur for the TLI and CRO.

7. Enter **DGN::SYNC a!**.
 - If DGN ...STF 0100 message is received, continue with Step 8.
 - If DGN ...STF 0200 message is received, proceed to Step 14.
8. If failed diagnostic is accompanied with the ESR SYNC COND E004 message, replace SPU pack for failed sync side and reenter sync diagnostic command.
 - If ESR ...E004 does not occur, proceed to Step 14.
9. If trouble persists, enter **RMV::MC!**.
10. Replace the CPU2 (TM778) located in the main controller.
11. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
12. Reenter **DGN::SYNC a!** for subject sync side.
13. If trouble persists, enter **RMV::MC!**. Unplug the same CPU2 pack and check plug-in position for bent pins or damaged backplane. The connections between the CPU2 and the sync are suspect. Reinstall CPU2 after inspection and perform frame reset.
 - If trouble is found, proceed to Step 17.
 - If trouble is not found, check backplane for damage. If no wiring trouble is found, contact technical consultant for assistance.
14. Replace the TB pack and wait at least 30 minutes for the TB oven to warm up. The TB can be restored; but, for stratum 2 operation, it may take up to 2 hours to reach rated precision.
15. Reenter **DGN::SYNC a!** for subject side.
16. If trouble persists, unplug the DPLL and TB and check positions for bent pins or damaged backplane. The connections between the two positions are suspect. Reinstall packs after inspection.
 - If trouble is cleared, continue with Step 17.
 - If trouble is not cleared, check backplane for damage. If no wiring trouble is found, contact technical consultant for assistance.
17. Enter **RST::SYNC a!** to restore the sync.
18. Enter **CFR::SYNC a,FPLL!** to initiate sync fast start.

19. After approximately 5 minutes, enter **UTL : :QRY, STATE, SYNC!** to verify that the MODE for the subject side is NORMAL. Table 5-2 lists the outputs for each field of the query.

Table 5-2. SYNC Status Outputs

Message Field	Outputs and Meanings
CFR STRATUM MODE SOURCE	MASTER or SLAVED sync configuration. STR2, STR3, CEPT TOLL, or CEPT LOCAL. HOLDOVER, FAST, or NORMAL for each DPLL. Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE).
IN SERVICE-DPLL	DPLL side 0 side 1, TB side 0 side 1, SOURCE side 0 side 1; presence of a 0 for side means out-of-service and a 1 means in-service.
ACTIVE-LINK	Gives TLI No. and its SSP (0, 1) which is active on each side (0 and 1).
PLL TIMING ERROR	Presence of 0 for side means no error and presence of 1 for side means error.

20. Reinstall FC packs in their slots and enter the command(s) to restore each one as follows: **RST : :UNIT [q]q, FC sb!**
Where: sb = FC number which consists of side (s) and unit module (b).
21. Enter **UTL : :QRY, ALL!** to find any packs that are failed or out-of-service and perform corrective action.

⇒ NOTE:

The conditions are indicated by the presence of a "1" in the out-of-service, failed, and pested columns for each pack. Unequipped NPCs are indicated by dashes.

22. See Note. If any CPs are equipped but out-of-service, enter the RST (restore) command per Figure 5-1 for the pack.
- If command denial occurs, find the meanings of the denial codes in *Command Denials*.

⇒ NOTE:

When a CP fails in the sync, ECCN/CCN, or DSPU, service is switched and all the CPs on the failed side/group are removed from service and pested. To correct the problem, the failure must be cleared and the side (or all CPs) can be restored. If both sides/groups are failed, trouble must be cleared on the out-of-service side/group first; removal of the other side will be denied.

23. If any CPs are failed, enter the DGN (diagnose) command per Figure 5-1 for the pack.
 - If DGN ...STF message is received, refer to appropriate procedure in this chapter to clear the failed diagnostic.
 - If diagnostic passes (ATP or CATP), enter RST command.
24. To check for out-of-service, failed, and pested CPs, enter **UTL::QRY,ALL[,UNIT [q]q]!**.
25. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 5-1.
 - If command denial occurs, find the meanings of the denial codes in *Command Denials*.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 5-1. Maintenance Command Construction

Clear Failed CRO Diagnostic

1. If the alarm cutoff is not already operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If TLI 3 has not been removed from service (RMV COMPL in printout), enter **RMV : :SYNC, TLI 3, CRO!**.
3. Replace the CRO (clock reference oscillator) (that is, the additional TB pack on lower shelf) with the same code as the original one.
4. Enter **DGN : :SYNC, TLI 3, CRO!**.
 - If DGN ...STF message is received, continue with Step 5.
 - If DGN ...STF message is not received, wait 30 minutes for TB oven to reach temperature and then enter **RST : :SYNC, TLI 3, CRO!** to restore the CRO and to complete this procedure.
5. Locate diagnostic trouble number which appears immediately after STF in the diagnostic message.
 - If trouble number is 0600, continue with Step 6.
 - If the trouble number is not 0600, check CRO slot and backplane for damage. If no wiring trouble is found, contact technical consultant for assistance.
6. Verify that the same code of TB is used for all the sync TBs and determine if the sync configuration was changed subsequent to installation. The CRO (TLI 3 CRO) must be grown with the same TYPE designation as the other TBs in the sync.
 - If the CRO was equipped incorrectly, enter grow command as follows:

RMV : :SYNC, TLI 3, CRO! to remove additional TB pack from service.

DGRTH : :SYNC, TLI 3! to degrow the additional TB.

Enter command to regrow same TB with same type field as the TBs on the sides, **GRTH : :SYNC, TLI 3, TYPE TBpqr!**.

Wait 30 minutes for TB oven to reach temperature and then enter **RST : :SYNC, TLI 3, CRO!**.
 - If the CRO was equipped correctly, contact technical consultant for assistance.

Clear Failed TLI Diagnostic

1. If alarm cutoff has not already been operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Locate the trouble number which appears immediately after STF in the failed diagnostic message.
 - If trouble number is 0400, continue with Step 3.
 - If trouble number is not 0400, proceed to Step 4.
3. Check for ESR,ERR SYNC ...COND E601 message which indicates the T1 timing link connecting to the failed TLI has failed or has errors.
 - If you could determine there is trouble on the associated facility timing link, proceed to Step 8.
 - If not, continue with Step 4.
4. If the failed TLI has not been removed from service (as shown by previous RMV TLI COMPL or RST TLI DNY in printout), enter **RMV : :SYNC a, TLI m[, SSP b]!**

Where:

a = Subject sync side (0 or 1)

m = TLI number (1 through 4)

b = SSP number (0 or 1); required for all TLI types except type TD.

⇒ NOTE:

If the remove command is entered and the TLI is already out of service, the RMV TLI COND 04 DNY message will be received.

5. Replace the subject TLI pack with the same code as the original.
6. Enter **DGN : :SYNC a, TLI m[, SSP b]!**.
 - If DGN ...STF message is received, continue with Step 7.
 - If DGN ...STF message is not received, enter **RST : :SYNC a, TLI m[, SSP b]!** to restore the sync and to complete this procedure.
7. If the trouble number in the failed diagnostic is 0400, continue with Step 8.
 - If the trouble number in the failed diagnostic is not 0400, check TLI slot and backplane for damage. If no wiring problem is found, contact technical consultant.

8. Trouble is on facility timing link. Isolate trouble on timing link or contact network timing coordinator about using another facility. The TLI must be restored after the timing link is operating; the command is
RST::SYNC a,TLI m[,SSP b]!

Where:

a = Sync side

m = Subject TLI number.

b = SSP number (0 or 1); required for all TLI types except type TD.

Clear Failed Unit UC Diagnostic

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the UC (unit controller) has not been removed from service (as shown by previous RMV UC COMPL or RST UC DNY in printout), enter **RMV : :UNIT [q]q, UC!**

**NOTE:**

If the remove command is entered and the unit UC is already out of service, the RMV UC COND 04 DNY message will be received.

3. Find the diagnostic trouble number that appears immediately after STF in the diagnostic message.
 - If trouble number 0A00 or 0B00 is received, then replace the UBX (UM28 code) and proceed to Step 5.
 - If other trouble number is received, continue with Step 4.
4. Replace the CPU2 (TM778) for the unit.
5. Enter **RST : :UNIT [q]q, UC!**

Where: [q]q = Unit number (1 through 16).

- If DGN ...STF message is received, check UC slot and backplane for damage. The diagnostic includes continuity tests:
 - STF 0700 indicates LAN wiring (two twisted pairs)
 - STF 0900 indicates CPU error wiring (one wire with ground)
 - STF 0600 indicates CPU reset wiring (one wire with ground)
 - If no wiring problem is found, contact technical consultant.
- If RST ...DNY is received, find the meanings of the denial codes in *Command Denials*.

Clear Failed FTMI Diagnostic

1. If alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Check if the UBX pack (UM28 code) associated with the unit is installed. If it is not, install the pack and enter respective restore commands.
3. Enter **DGN : :UNIT [q]q, FTMI d!**
Where:
[q]q = Unit number (1 through 16)
d = FTMI number (1 through 4).
 - If DGN ...STF message is received, continue with Step 4.
 - If DGN ...STF message is not received, proceed to Step 12.
4. If the FTMI (facility terminating module interface) has not been removed from service (RMV FTMI COMPL or RST FTMI DNY in printout), enter **RMV : :UNIT [q]q, FTMI d!**.
5. Replace the FTMI (TG81 code) for the unit. This pack is implicated by any of the DGN FTMI ...STF trouble numbers.
6. Enter **DGN : :UNIT [q]q, FTMI d!** to diagnose the FTMI.
 - If DGN ...STF message is received, continue with Step 7.
 - If DGN ...STF message is not received, proceed to Step 12.
7. Locate the data bytes on the line below the STF number in the failed diagnostic message. These are referred to as data 5 through data 0, going from left to right.
 - If data 5 byte is equal to FF, continue with Step 8.
 - If not, proceed to Step 9.
8. The FTMI is not functioning, possibly because it is not receiving timing which is delivered through the associated FC. Verify that these packs are in-service and check printout for string of failure messages; also check the backplane for obvious damage to pins at the involved plug-in positions.
 - If the trouble is found and corrected, proceed to Step 12.
 - If not, contact technical consultant for assistance.
9. Enter **RMV : :UNIT [q]q, UC!**.

Where: [q]q = Unit number (1 through 16).

10. Replace UBX (UM28 code).
11. Enter **RST::UNIT [q]q,UC!**.
12. Enter **RST::UNIT [q]q,FTMI d!**.
 - If DGN ...STF message is received, contact technical consultant for assistance.
 - If not, this procedure is completed.

Clear Failed DSPI Diagnostic

1. If the alarm cutoff is not already operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Notice which DSPU is named in the failed diagnostic message.
3. Enter **UTL : :QRY, ALL, COMMON!** to determine if the ETSI on one side for the unit is in-service and not failed. Ones in the 3-digit field for each ETSI indicate out-of-service, failed, or pested conditions.
 - If the ETSIs on both sides for the unit are failed, refer to Section 5.13 to clear the CCI failure which is causing the DSPI failure.
4. If the DSPI has not been removed from service (RMV DSPI COMPL or RST DSPI DNY in printout), enter **RMV : :UNIT [q]q, DSPI!**

Where: [q]q = Unit number (1 through 16).

5. Replace the DSPI pack (UM29 code) for that DSPU. There is only one DSPI in the unit and it is the interface between the unit UC and the other DSP packs; it does not carry service channels.
6. Enter **RST : :UNIT [q]q, DSPI!**.
 - If DGN ...STF message is received, check connector pins at DSPI slot and check backplane for damage. If no wiring trouble is found, contact technical consultant.
 - If RST ...COMPL message is received, this procedure is completed.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.

Clear Failed FC Diagnostic

⇒ NOTE:

The FC diagnostic runs continuity tests between the FC and the ECCN. These tests actually involve accessing time slots on an NPC in the unit and checking the connection through the cables and the ECCN. Similarly, when the ETSI for the unit was diagnosed, the interconnection between it and the other ETSIs was tested.

1. If alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Check if the UBX (UM28 code) and the network CCI/CCNI and ETSI/TSI packs associated with the unit are installed and/or restored. If they are not, install the pack(s) and enter the respective restore commands.
3. If all the FCs on the inactive side have failed, check for SYNC ...ERR,ESR messages (see Note). To check for change from cross-couple timing, enter **UTL : :QRY,STR,SYNC a!** (a = Side 0 or 1), and see Figure 5-2.

⇒ NOTE:

A sync error can cause the mate sync to lose cross-couple timing which will cause loss of timing to the FCs. If there are no cross-connections on the frame, this condition will not be reported.

4. Enter **DGN : :UNIT [q]q,FC sb!**

Where:

[q]q = Unit number (01 through 16)

sb = FC number consisting of side (0 or 1)
and FC in module (1 through 4).

- If DGN ...STF message is received, continue with Step 5.
- If DGN ...STF message is not received, proceed to Step 16.

5. If the FC has not been removed (RMV FC COMPL or RST FC DNY in printout), enter **RMV::UNIT [q]q,FC sb!**.
6. Replace subject FC pack (TG79 code). The FC itself is always implicated by any of the DGN FC ...STF trouble numbers.
7. Enter **DGN::UNIT [q]q,FC sb!** for the same unit and FC numbers.
 - If DGN ...STF message is received, continue with Step **8**.
 - If DGN ...STF message is not received, proceed to Step **16**.
 - If message has one of the following trouble numbers: STF 0F03 through 0F06 and optional second line giving UPN and XPN numbers, proceed to Step **10**.

M...UTL QRY STR SYNC a
 byte1, byte2, byte3, byte4, byte5, byte6
 byte7, byte8, byte9, byte10, byte11, byte12 COMPL

BYTE 1 (BITS abcdefgh)

a = spare	e = TLI 1 in service
b = sync hardware failed	f = TLI 2 in service
c = mate failed or OOS	g = TLI 3 in service
d = TB failed or OOS	h = TLI 4 in service

BYTE 3 (BITS abcdefgh)

a = sync reset, needs config.	e = crosscouple trouble
b = DPLL hardware error	f = CRO timing trouble
c = TB error	g = spare
d = PLL symmetry error	h = spare

BYTE 5 BIT POSITIONS: ab cde fgh

SOURCE (BITS ab)	ACTIVE PORT (BITS cde) (if BITS ab = 01)
00 = holdover	000 = TLI 1, SSP 0
01 = timing link	001 = TLI 1, SSP 1
10 = cross-couple	010 = TLI 2, SSP 0
11 = CRO	011 = TLI 2, SSP 1
	100 = TLI 3, SSP 0
	101 = TLI 3, SSP 1
	110 = TLI 4, SSP 0
	111 = TLI 4, SSP 1
BITS fgh (unused)	

BYTE 9 (BITS abcdefgh)

a = loss of energy	d = TB oven still cold
b = TB command error	e = spare
c = TB oscillator drift (master mode)	fgh = 000 for stratum 3, 001 for 2-Mb/s local 010 for 2-Mb/s toll, 011 for stratum 2

Figure 5-2. Sync Status Register

8. Convert the first data byte after the STF number in the diagnostic message to binary. The right HEX-digit gives bits 4,3,2,1. If bit 2 equals 1, a network ETSI or CCB could be causing the diagnostic failure; check the printout for ETSI or SYNC ...ERR,ESR messages.
9. If you found an ETSI or CCB related failure, continue with Step 10.
 - If you did not find an ETSI or CCB related failure, proceed to Step 13.
10. If the ETSI or CCB for the same unit and side as the failed FC is not out-of-service, enter appropriate command as follows:

RMV::ETSI sqq!.

RMV::CCB sf!.

Where: s = Side

qq = Unit number

f = CCB number (1 through 6).

11. Replace that ETSI or CCB and enter appropriate command as follows:

RST::ETSI sqq!.

RST::CCB sf!.

12. Enter **DGN::UNIT [q]q,FC sb!** for the subject unit and FC.
 - If DGN ...STF message is received, continue with Step 13.
 - If DGN ...STF message is not received, proceed to Step 16.
 - If message has one of the following trouble numbers: STF 0F03 through 0F06 and optional second line giving UPN and XPN numbers, proceed to Step 17.

13. Enter **RMV::UNIT [q]q,UC!.**

14. Replace the UBX (UM28 code) for the subject unit.

15. Enter **RST::UNIT [q]q,UC!** for the subject unit.

16. Enter **RST::UNIT [q]q,FC sb!** for the subject unit and FC.
 - If DGN ...STF message is received, obscure problem; contact technical consultant.
 - If DGN ...STF message is not received, this procedure is completed.

17. From Table 5-3, identify the faulty cable connecting to the subject FC pack by the UPN (unit plug number) and XPN (ECCN plug number) named in the message. Notice that there are different listings for the flexible interface and original interface bays and that the ECCN plug number includes the unit number.
18. Replace (or have repaired) the cable identified above. The unit and ECCN plug numbers are stamped alongside the connectors on the ECCN panel; see Figure 5-3.
19. Enter **RST::UNIT [q]q,FC sb!** for the subject unit and FC.

**NOTE:**

The diagnostic reports one cable problem at a time; so if different UPN and XPN numbers occur, clear that trouble before contacting the technical consultant.

- If DGN ...STF message is received, obscure problem; contact technical consultant.

Table 5-3. Cable Identification

Unit Plug (Flex Bay)	Unit Plug (Orig. Bay)	ECCN Plug	Direction	Involved FC
P1	P2	P<unit>A	Receive	FC 01
P2	P1	P<unit>E	Transmit	FC 01
P3	P7	P<unit>B	Receive	FC 02
P4	P6	P<unit>F	Transmit	FC 02
P5	P12	P<unit>C	Receive	FC 03
P6	P11	P<unit>G	Transmit	FC 03
P7	P17	P<unit>D	Receive	FC 04
P8	P16	P<unit>H	Transmit	FC 04
P10	P5	P<unit>A	Receive	FC 11
P11	P4	P<unit>E	Transmit	FC 11
P12	P10	P<unit>B	Receive	FC 12
P13	P9	P<unit>F	Transmit	FC 12
P14	P15	P<unit>C	Receive	FC 13
P15	P14	P<unit>G	Transmit	FC 13
P16	P20	P<unit>D	Receive	FC 14
P17	P19	P<unit>H	Transmit	FC 14

(LEFT SIDE OF ECCN PANEL)							
P3A	P3B	P3C	P3D	P3E	P3F	P3G	P3H
P4A	P4B	P4C	P4D	P4E	P4F	P4G	P4H
P6A	P6B	P6C	P6D	P6E	P6F	P6G	P6H
P9A	P9B	P9C	P9D	P9E	P9F	P9G	P9H
P10A	P10B	P10C	P10D	P10E	P10F	P10G	P10H
P12A	P12B	P12C	P12D	P12E	P12F	P12G	P12H
P15A	P15B	P15C	P15D	P15E	P15F	P15G	P15H
P16A	P16B	P16C	P16D	P16E	P16F	P16G	P16H
B O T T O M	P17A	P17B	P18A		P19		
	P14A	P14B	P14C	P14D	P14E	P14F	P14G
	P14H						
	P13A	P13B	P13C	P13D	P13E	P13F	P13G
	P13H						
	P11A	P11B	P11C	P11D	P11E	P11F	P11G
	P11H						
	P8A	P8B	P8C	P8D	P8E	P8F	P8G
	P8H						
	P7A	P7B	P7C	P7D	P7E	P7F	P7G
	P7H						
	P5A	P5B	P5C	P5D	P5E	P5F	P5G
	P5H						
	P2A	P2B	P2C	P2D	P2E	P2F	P2G
	P2H						
	P1A	P1B	P1C	P1D	P1E	P1F	P1G
	P1H						
(RIGHT SIDE OF ECCN PANEL)							

Figure 5-3. Cable Connectors on ECCN Panel

Cross-Connect Interface

Clear Failed CCI Diagnostic

Overview: This procedure deals with a failed CCI (clock control interface) diagnostic. If the trouble is not the CCI pack itself, it can be caused by circuit packs associated with ECCN, MC, or SYNC depending on the diagnostic trouble code. For an associated ETSI (trouble code 0800), the raw data bytes in the DGN CCI STF message are used to identify the particular ETSI.

1. If alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the CCI has not been removed from service (RMV CCI COMPL or RST CCI DNY in printout), enter **RMV : :CCI s!** for the side (0 or 1) that failed.
3. Locate the trouble number which appears immediately after STF in the diagnostic message.
4. If trouble number 0080 appears in the message, then check CCI slot and backplane for damage. For associated sync trouble, the suspect wiring is in the two small 6-wire cables going between the top of P19 and P37 for ECCN1 and the bottom of P19 and P36 for ECCN0. If no wiring problem is found, contact technical consultant.
 - If trouble number 0080 does not appear, proceed to Step 7.
5. Unseat the CCI pack for the side of the network named in the message and reinsert the pack to reset it.
6. Enter **DGN : :CCI s!** for the same CCI pack.
 - If DGN ...STF message is received, continue with Step 7.
 - If DGN ...STF message is not received, proceed to Step 27.
7. Replace CCI pack (BBS1 code) named in the diagnostic message.
8. Enter **DGN : :CCI s!** for same pack.
 - If DGN ...STF message is received, continue with Step 9.
 - If DGN ...STF message is not received, proceed to Step 27.

9. Which trouble number appears in the diagnostic message?

- If **0000**, proceed to Step **12**.
- If **0100**, continue with Step **10**.
- If **0001** or **0010**, proceed to Step **12**.
- If **0004**, **0040**, or **0200**, check CCI slot and backplane for damage. For associated sync trouble, the suspect wiring is in the two small 6-wire cables going between P20, P36, and P37. If no wiring problem is found, contact technical consultant.
- If **0020**, proceed to Step **12**.
- If **0002** or **0008**, proceed to Step **18**.
- If **0800**, proceed to Step **20**.
- If **8000**, proceed to Step **10**.

10. Verify that the BT on each side of the ECCN shelf is securely installed.



NOTE:

The bus terminators contain only passive components and are not likely to fail. However, if the same diagnostic trouble number persists after all suspect packs have been replaced, you may want to try replacing the BTs, one at a time.

11. If DGN ...STF message is received after BTs are reseated (or replaced) and diagnostic is reentered, continue with Step **12**.

- If DGN ...STF message is not received, proceed to Step **27**.

Continue for Trouble No. 0000, 0001, 0010, 0020, 0100, or 8000

12. Enter **RMV::MC!**.
13. Disconnect and reseat appropriate pack in the MC for trouble number as follows:
 - For 0020, replace the EMTC (UM75 code).
 - For others, replace the EBX (UM71 code).
14. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

**NOTE:**

It is important to remember that after this RESET is complete, the frame will be in simplex mode. Resetting the frame does not automatically restore the side containing the new CCI circuit pack.

15. Enter **DGN::CCI s!**.
 - If DGN ...STF message is received, continue with Step **16**.
 - If DGN ...STF message is not received, proceed to Step **27**.
16. Replace the plug-in that was previously resealed.
17. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button and proceed to Step **26**.

Continue for Trouble No. 0002 or 0008

18. Enter **RMV::SYNC s!** for the sync on the same side as the failed CCI.
19. Replace the DPLL (TM590 code) in the same side of the sync and enter **RST::SYNC s!** to restore the same sync.
 - If DGN ...STF message is received, go to Section 5.6.
 - If DGN ...STF message is not received, proceed to Step 27.

Continue for Trouble No. 0800

20. Notice the data bytes starting on the second line of the failed CCI diagnostic message. These bytes are referred to as data 21 through data 00, starting on the second line and running to the end of the third line.
21. If data 19 (third from the left in the top row of data) equals 07, continue with Step 22.
 - If data 19 (third from the left in the top row of data) does not equal 07, then check CCI slot and backplane for damage. For associated sync trouble, the suspect wiring is in the two small 6-wire cables going between P20, P36, and P37. If no wiring problem is found, contact technical consultant.
22. Convert data 21 and 20 (first two data bytes in the top row of data) from hexadecimal to binary as follows:
 - Work with each digit of a data byte individually.
 - Convert each hexadecimal digit to the 4-place binary equivalent. Hex numbers run from 1 through 9 and a through f (for 10 through 16); for example, hex 5 = 0101 binary.
23. Combine the patterns of the binary numbers for data 21 and 20 and locate the bit position where the value is a 1. For example, if data 21 equals 00000000 binary and data 20 equals 10000000 binary, the combined pattern would be 0000000010000000, and the value 1 is located in position 8 (counting from right to left).
24. Enter **RMV::ETSI sqq!** for the ETSI of the unit number that matches the bit position with the value 1. (In the above example, that would be unit 08.)

Where:
s = Side 0 or 1
qq = Unit number (01 through 16).
25. Replace the same ETSI (BBS2 code) and enter **RST::ETSI sqq!** for that pack.

26. Enter **DGN::CCI s!**.
 - If DGN ...STF message is received, check CCI slot and backplane for damage. For associated sync trouble, the suspect wiring is in the two small 6-wire cables going between P20, P36, and P37. If no wiring problem is found, contact technical consultant.
 - If DGN ...STF message is not received, continue with Step 27.
27. Enter **RST::CCI s!** to restore CCI to service.
28. If DGN ...STF message is received, check CCI slot and backplane for damage. For associated sync trouble, the suspect wiring is in the two small 6-wire cables going between P20, P36, and P37. If no wiring problem is found, contact technical consultant.
29. If DGN ...STF message is not received, enter **UTL::QRY,ALL!** to find any packs that are failed or out-of-service and perform corrective action.

**NOTE:**

The conditions are indicated by the presence of a "1" in the out-of-service, failed, and pested columns for each pack. Unequipped NPCs are indicated by dashes.

Clear Failed CCNI Diagnostic

Overview: This procedure deals with a failed CCNI (cross-connect network interface) diagnostic. If the trouble is not caused by a failed CCNI or BX in the MC, it may be caused by an error from a unit FTMI, a network CCB, or a TSI connected to the CCNI. When the failed diagnostic is caused by an error from an associated pack, that pack is identified by the raw data fields of the DGN CCNI STF message.

1. If alarm cutoff is needed, enter **UTL::ACO!**.
2. If the CCNI has not been removed from service (RMV CCNI COMPL or RST CCNI DNY in printout), enter **RMV::CCNI s!** for the side (0 or 1) that failed.
3. Replace CCNI pack (UM30 code) for the side of the CCN network named in the diagnostic message.
4. Enter **DGN::CCNI s!**.
 - If DGN ...STF message is received, continue with Step 5.
 - If DGN ...STF message is not received, proceed to Step 12.

5. Locate trouble number which appears immediately after STF in the diagnostic message.
 - If the trouble number does NOT start with 074 or 07B, proceed to Step 9.
 6. Enter **RMV::MC!**.
 7. Replace BX pack in the MC.
 8. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button, and proceed to Step 12.
 9. Locate the data bytes to the right of the STF number in the failed diagnostic message. These bytes are referred to as data 5 through data 0, going from left to right.
 - If any of the these bytes (data 5 through data 1) have nonzero characters, then continue with Step 10.
 - If not, check CCNI slot and backplane for damage. If no wiring problem is found, contact technical consultant.
 10. From Table 5-4, determine the pack which is sending an error to the CCNI. The value of the character (8,4,2,1) and its position in the 4-place data byte indicates the associated pack. For example, if data byte d2 = 0040 (row "cccc" in table), the 4 in the column implicates TSI s54. The side (s) is the same as the subject CCNI.
 11. Enter command to remove the same pack from service and replace the pack. For FTMI, enter **RST::UNIT q,FTMI b!** to restore it to service.
- Where: q = Unit number
b = FTMI number (1 through 4) in the unit.
12. Enter **RST::CCNI s!**.
 - If DGN ...STF message is received in restore sequence, check CCNI slot and backplane for damage. If no wiring problem is found, contact technical consultant.
 13. If an associated TSI or CCB was removed from service, enter command to restore it using the appropriate command, **RST::TSI sft!** or **RST::CCB sf!**.

Where:

sf = CCB number consisting of side (0 or 1)
and unit number.

sft = TSI number consisting of side (0 or 1),
from-side unit number, and to-side number.

14. Enter **UTL::QRY,ALL!** to find any packs that are failed or out-of-service and perform corrective action.

**NOTE:**

The conditions are indicated by the presence of a "1" in the out-of-service, failed, and pested columns for each pack. Unequipped NPCs are indicated by dashes.

Table 5-4. Port Alarms (CCNI Diagnostic)

SINGLE CHARACTER VALUE	DATA 1 (ESR1, TSI FROM, TO UNIT ID)			
	b	b	b	b
8	43	63	22	41
4	33	52	12	31
2	23	42	61	21
1	13	32	51	11
DATA 2 (ESR2, TSI FROM, TO UNIT ID)				
	c	c	c	c
8	26	45	64	24
4	16	35	54	14
2	65	25	44	63
1	55	15	34	53
DATA 3 (ESR3, FTM NO. OR TSI FROM, TO UNIT ID)				
	d	d	d	d
8	Unit 3,FTMI 4	Unit 2,FTMI 4	Unit 1,FTMI 4	66
4	Unit 3,FTMI 3	Unit 2,FTMI 3	Unit 1,FTMI 3	56
2	Unit 3,FTMI 2	Unit 2,FTMI 2	Unit 1,FTMI 2	46
1	Unit 3,FTMI 1	Unit 2,FTMI 1	Unit 1,FTMI 1	36
DATA 4 (ESR4, FTM NO. OR CCB NO.)				
	e	e	e	e
8	CCB4	Unit 6,DSPI	Unit 5,DSPI	Unit 4,FTMI 4
4	CCB3	Unit 6,DSPI	Unit 5,DSPI	Unit 4,FTMI 3
2	CCB2	Unit 6,DSPI	Unit 5,DSPI	Unit 4,FTMI 2
1	CCB1	Unit 6,DSPI	Unit 5,DSPI	Unit 4,FTMI 1
DATA 5 (ESR5, CCB NO.)				
	f	f	f	f
8	-	-	-	-
4	-	-	-	-
2	-	-	-	CCB 6
1	-	-	-	CCB 5

Time Slot Interchange

Clear Failed ETSI Diagnostic

Overview: This procedure deals with the failed ETSI (expanded time slot interchange) diagnostic. If the trouble is not the ETSI pack itself, it can be caused by other ECCN packs or an associated MC or Sync pack depending on the diagnostic trouble number. The data bytes in the diagnostic message in some cases identify another suspect ETSI pack; otherwise, the other ETSI is determined by trial and error. *Multiple ETSI failures are usually caused by a failed CCI pack; autonomous error recovery operations may have already removed the CCI to allow replacement.*

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the subject ETSI has not been removed from service (RMV ETSI COMPL or RST ETSI DNY in printout), enter **RMV : :ETSI sqq!**

Where: sqq = Failed ETSI number consisting of the side (s)
and unit number (qq) that it serves.

3. To avoid the possibility of alarms on ETSI ports, enter command to remove service from side with failed ETSI, **RMV : :CCI s!** (s = side).
4. Replace the subject ETSI pack (BBS2 code) named in the failed diagnostic message. If a second ETSI pack is named in the message, that ETSI pack will be addressed (as an additional suspect pack) in subsequent steps.
5. Enter command to restore side to service, **RST : :CCI s!** (s = side).
6. Enter **DGN : :ETSI sqq!**.
 - If DGN ...STF message is received, continue with Step 7.
 - If DGN ...STF message is not received, enter **RST : :ETSI sqq!** for the subject ETSI pack. This procedure is completed.
7. Locate the trouble number which appears immediately after STF in the diagnostic message. Also notice the data bytes starting on the second line of the failed ETSI diagnostic message. These bytes are referred to as data 15 through data 00, starting on the second line and running to the end of the third line.

8. Which trouble number (or keyword) appears in the message?
 - If **additional ETSI named in message**, proceed to Step 22.
 - If **0080**, continue with Step 9.
 - If **0100**, continue with Step 9.
 - If **0008**, proceed to Step 14.
 - If **0020, 0040, 0800, or 1000**, proceed to Step 27.
 - If **8000**, proceed to Step 15.
 - If **other number**, proceed to Step 15.
9. Locate data 1; the data bytes occur in left-to-right order from d15 to data 00. Convert the 2 lower digits (right half) to binary as follows:
 - Work with each digit of the data byte individually.
 - Convert each hexadecimal digit to the 4-place binary number equivalent. Hex numbers run 1 through 9 and a through f (for 10 through 16); for example, hex 5 = 0101 binary.
10. The resulting 8-bit binary number represents the connecting ports from the FC (in FTU), FMT (in DS3U or HDS3U), or NPC (in DSPU), as applicable; a 1 in the port position indicates a trouble. Identify the suspect pack as follows:
 - For FCs, each pair of bits (in the 8-bit number) represents the FC for the module as follows: pair 8-7 is module 4, pair 6-5 is module 3, pair 4-3 is module 2, and pair 2-1 is module 1.
11. If any ports are alarmed, enter the RMV command for the suspect pack per Figure 5-4 and reseal the same pack. Enter commands to restore the subject ETSI (for timing to unit) and the suspect pack.

**NOTE:**

If DSPU NPC is to be replaced, remove the side from service before doing replacement (**RMV : CCI s!**). Restore side to service after replacement (**RST : CCI s!**).

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPi}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 5-4. Maintenance Command Construction

12. If either a DGN ...STF or RST ...DNY message is received, enter command to remove the suspect pack, replace it, and enter the command to restore it to service.
13. Enter **DGN::ETSI sqq!** for the subject ETSI pack.
 - If DGN ...STF message is received, proceed to Step 15.
 - If DGN ...STF message is not received, enter **RST::ETSI sqq!** for the subject ETSI pack.
14. Check for any 48-volt fuse feeding the ECCN on the ED-2C945-30 fuse panel blown (indicator fuse bead extended).
 - If there is a blown fuse, go to *Power Failures*.

15. If not already removed from service, enter **RMV::CCI s!** to remove the CCI for the failed side.
Where: s = Side (0 or 1).
 16. Replace CCI pack (BBS1 code) for failed side.
 17. Enter **RST::CCI s!**.
 18. Enter **DGN::ETSI sqq!** for subject ETSI pack.
 - If DGN ...STF message is received, continue with Step 19.
 - If DGN ...STF message is not received, enter **RST::ETSI sqq!** for the subject ETSI pack.
 19. If there is another pack listed in Table 5-5 for the trouble number, continue with Step 20.
 - If there is not another pack, proceed to Step 21.
 20. Enter command to remove next pack listed in Table 5-5, replace the pack, and enter command to restore the pack to service considering the following:
 - For DPLL, work on same side of Sync as failed ETSI.

 **CAUTION:**
No circuit card nor the SMEM memory card should be physically removed from the frame or inserted into the frame while a frame reset or reboot is in progress.
 - To restore EBX or CPU, reset frame using RESET controls on the status panel.
 - The BTs contain passive components for resistive termination. If suspect, check if they are securely inserted and enter ETSI diagnostic; if secure, replace one at time and reenter diagnostic each time.

 **NOTE:**
To prevent alarms, remove the side before replacing an ECCN plug-in (**RMV::CCI s!**). Restore the side after the replacement (**RST::CCI s!**).
- Repeat from Step 18.

Table 5-5. Implicated Plug-Ins

Trouble No.	Plug-Ins	Commands
0001	ETSI CCI DPLL (in sync)	{RMV RST}::ETSI sqq! {RMV RST}::CCI s! {RMV RST}::SYNC a!
0002, 0010, 0020, 0040, 0100, 0200, or 0800	ETSI	{RMV RST}::ETSI sqq!
0004	ETSI CCI EBX (in MC) BTs	{RMV RST}::ETSI sqq! {RMV RST}::CCI s! RMV::MC!
0008, 0400, or 8000	ETSI CCI	{RMV RST}::ETSI sqq! {RMV RST}::CCI s!
0080 or 1000	ETSI BTs	{RMV RST}::ETSI sqq!

**NOTE:**

Trouble number 0800 may also indicate a ribbon cable problem.

21. If you are clearing trouble number 0004, proceed to Step 27.
 - If you are not clearing trouble number 0004, check ETSI slot and backplane for damage. If no wiring problem is found, contact technical consultant.

**NOTE:**

For STF 0100, the port alarm pack identification also identifies the suspect wiring.

Continue for Additional ETSI in Message

22. Notice the suspect ETSI identified by the optional SNN designation in the failed ETSI diagnostic.
23. Enter **RMV::ETSI sqq!**.
24. Enter **RMV::CCI s!** to remove the side from service. Replace the ETSI.
25. Enter **RST::CCI s!** to restore the side to service.
26. Enter **DGN::ETSI sqq!** for the ETSI that originally failed.
 - If DGN ...STF message is received, check ETSI slot and check backplane for damage. If no wiring problem is found, contact technical consultant.
 - If DGN ...STF message is not received, enter **RST::ETSI sqq!** commands to restore the ETSI packs.

Continue for Trouble No. 0020, 0040, 0800, or 1000

27. If diagnostic trouble 0020 or 0040 is received, continue with Step 28.
 - If diagnostic trouble 0020 or 0040 is not received, proceed to Step 30.
28. Locate data byte 04 and convert it to binary as follows:
 - Work with each digit of the data byte individually.
 - Convert each hexadecimal digit to the 4-place binary number equivalent. Hex numbers run 1 through 9 and a through f (for 10 through 16); for example, hex 5 = 0101 binary.
29. The resulting 16-bit binary number represents the ETSIs in the frame, with ETSI 16 on the left and 1 on the right. Identify each suspect ETSI which is indicated by a 1 in the 16-bit binary number.
30. See Notes 1 and 2. Select one of the implicated plug-ins and enter command to remove that ETSI and unplug it. Enter **DGN::ETSI sqq!** for the original ETSI. Repeat as necessary for each of the suspect ETSIs.

⇒ NOTE 1:

To prevent alarms, remove the side before replacing ETSI (**RMV::CCI s!**). After replacement, restore the side to enable ETSI diagnostic and restoral (**RST::CCI s!**).

⇒ NOTE 2:

The implicated ETSIs are either the ones identified by data 04 in Step 28 or all the remaining ones if none were identified by data 04.

31. If DGN ...ATP (or CATP) was received when one of the implicated ETSIs was unplugged, replace ETSI found to be causing the failure and install ETSIs that were unplugged. Enter **RST::ETSI sqq!** commands to restore ETSI packs.
 - If the DGN ...ATP (or CATP) was not received, continue with Step 32.
32. If there is another pack listed in Table 5-5 for the trouble number, continue with Step 33.
 - If there is not another pack, contact technical consultant.
33. Enter command to remove next pack listed in Table 5-5, replace the pack, and enter command to restore the pack to service considering the following:
 - For DPLL, work on same side of sync as failed ETSI.
 - To restore EBX or CPU, reset frame using RESET controls on the status panel.
 - The BTs contain passive components for resistive termination. If suspect, check to see if they are securely inserted and enter ETSI diagnostic; if secure, replace one at a time and reenter diagnostic each time.

 **NOTE:**
To prevent alarms, remove the side before replacing an ECCN plug-in (**RMV::CCI s!**). Restore the side after the replacement (**RST::CCI s!**).
34. Enter **DGN::ETSI sqq!**.
 - If DGN ...STF message is received, repeat from Step 32.
 - If DGN ...STF message is not received, enter **RST::ETSI sqq!** for the subject ETSI pack.

Clear Failed TSI Diagnostic

1. If the alarm cutoff is not already operated, enter **UTL : :AC0!**.
2. If the subject TSI (time slot interchange) has not been removed from service (RMV TSI COMPL or RST TSI DNY in printout), enter **RMV : :TSI sft!**

Where: sft = Failed TSI number.

3. Replace the TSI pack (TM660 code) named in the failed diagnostic message.
4. Enter **DGN : :TSI sft!**

Where: sft = Failed TSI number which consists of Side (0 or 1), From-unit (1 through 6), and To-unit (1 through 6).
For example, TSI 013 is on side 0 and receives data from unit 1 and connects to unit 3.

- If DGN ...STF message is not received, proceed to Step 10.

5. Locate the trouble number which appears immediately after STF in the diagnostic message.
 - If none of the following trouble numbers are received (01B0, 0540, 05B0, or any starting with 014), check connector pins at failed TSI slot and check backplane for damage. If no wiring trouble is found, contact technical consultant.
6. Enter command to remove the CCNI for the failed side as follows:
RMV : :CCNI s!

where: s = Side (0 or 1).

7. Replace that CCNI pack (UM30 code).
8. Enter **RST::CCNI s!**.
9. Enter **DGN::TSI sft!** to diagnose TSI that originally failed.
 - If DGN ...STF message is received, check connector pins at failed TSI slot and check backplane for damage. If no wiring trouble is found, contact technical consultant.
10. Enter command to restore subject TSI pack to service as follows:
RST::TSI sft!.
 - If trouble persists, contact technical consultant.

Clear Failed NPC (FTU) Diagnostic

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Enter **DGN : :NPC <npc No.>!** where the NPC number is the same one given in the failed diagnostic message.
 - If DGN ...STF message is received, continue with Step 3.
 - If DGN ...STF message is not received, proceed to Step 12.

**NOTE:**

The diagnostic includes looped tests that check the NPC transmission paths and tests that check the facility performance monitoring.

3. In order to see if the ECCN packs are affecting the failure, configure the ECCN to the other side as follows:
 - Enter **UTL : :QRY,STR,XC a!** for each side (a = 0,1) and determine the active side from output (rightmost data byte equals 05 for in-service and active).
 - Enter **UTL : :QRY,ALL,COMMON!** to verify that packs on the inactive side are not failed because switching to a failed side could cause loss of service.
 - If the inactive side is not failed, enter **CFR : :XC a!** (for inactive side) to switch ECCN sides.
4. Enter **DGN : :NPC <npc No.>!** where the NPC number is the same one given in the failed diagnostic message.
 - If DGN ...STF message is received, proceed to Step 10.
 - If DGN ...STF message is not received, continue with Step 5.
5. Enter **RMV : :UNIT [q]q,FC sb!** for the same unit ([q]q), inactive side, and module (b) in the unit, replace that FC pack, and enter **RST : :UNIT [q]q,FC sb!**.
6. At low traffic time, enter **CFR : :XC a!** (for inactive side) to switch to other ECCN side.

7. Enter **DGN::NPC <npc No.>!** where the NPC number is the same one given in the failed diagnostic message.
 - If DGN ...STF message is received, continue with Step 8.
 - If DGN ...STF message is not received, proceed to Step 12.
8. Perform the appropriate action as follows:
 - If the original failure occurred immediately after a cross-connection was entered, find the implicated ETSI. The ETSI number (sqq) consists of side (opposite - original side) and the unit number associated with the FROM and TO sides of the cross-connection. Enter **RMV::ETSI sqq!**, replace the ETSI pack, and enter **RST::ETSI sqq!**.
 - If failure cannot be related to cross-connection, enter commands to individually remove and restore the ETSIs on the inactive side and look for failed diagnostics.
9. Enter **DGN::NPC <npc No.>!** where the NPC number is the same one given in the failed diagnostic message.
 - If DGN ...STF message is received, continue with Step 10.
 - If DGN ...STF message is not received, proceed to Step 12.

**CAUTION:**

When an NPC is removed, service is interrupted on all the cross-connected circuits of that NPC and trunk conditioning is sent on the channels. Contact special service customers and replace plug-ins quickly.

10. When the other NPC on the affected dual card (for example, DPC) can be removed from service, enter command to remove the other NPC as follows: **RMV::NPC <npc No.>[, INCL]!**.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

INCL = Optional, needed to remove NPC with red circuits and CUS circuits. Enter

UTL::QRY, MARK <npc No.>!

to see if the NPC has red or CUS circuits.

11. Replace the pack for the two affected NPCs.

12. If needed (see Note), enter **RST::NPC <npc No.>[-<range>]!** for the subject NPC and for the other NPC on the pack if that NPC was also removed.

**NOTE:**

The NPC restoral is needed if the NPC was removed from service (manually or autonomously as part of error recovery) or if a previous restore command was denied because of a failed diagnostic.

- If DGN ...STF message is received, check connector pins at plug-in slot and check backplane for damage. If no wiring problem is found, contact technical consultant.
- If RST ...COMPL message is received, this procedure is completed.
- If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.

Clear Failed DSPU NPC Diagnostic

⇒ NOTE:

The DSPU NPC diagnostic runs continuity tests between the DSPU and the ECCN. These tests actually involve accessing timeslots on an NPC in the unit and checking the connection through the cables and the ECCN. Similarly, when the ETSI for the unit was diagnosed, the interconnection between it and the other ETSIs was tested.

1. If the alarm cutoff is needed, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Notice which NPC number and side (0 or 1) are named in the failed diagnostic message.

⇒ NOTE:

The plug-in for the DMB function contains two NPCs, but the CPR plug-in only has circuitry for one NPC. The DSP positions are duplicated on the sides of the DSPU so that service will be switched to the mate when an NPC fails or is removed.

3. If the subject NPC has not been removed from service (RMV COMPL or RST DNY in printout), enter
RMV : :NPC <npc No.>,SIDE s[, INCL]!

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

s = Side (0 or 1).

INCL = Optional, needed to remove NPC with cross-connected red circuits, and subrate circuits with established channels.

4. Enter **DGN : :NPC <npc No.>,SIDE s!** for subject NPC number and side.
 - If DGN ...STF message is received, continue with Step 5.
 - If DGN ...STF message is not received, proceed to Step 15.
5. Enter **RMV : :CCI s!** or **RMV : :CCNI s!** (whichever is appropriate) for the same side as the failed DSP NPC. This prevents an alarm (and DSP removal) on other DSPs. Even though the ECCN side is not active, if it is in-service, a glitch on the bus can trigger the alarm.
6. Replace the DSP plug-in for the NPCs (for example, DMB) on the side.

7. Enter **RST::CCI s!** or **RST::CCNI s!** (whichever is appropriate) to restore the network side to service.
8. Enter **DGN::NPC <npc No.>,SIDE s!** for subject NPC number and side.
 - If DGN ...STF message is received, continue with Step 9.
 - If DGN ...STF message is not received, proceed to Step 15.
 - If message gives a trouble number in the range STF 0F03 through 0F06 and optional second line with UPN and XPN numbers, proceed to Step 13.
9. Enter **RMV::UNIT [q]q,DSPI!**, replace DSPI, and enter **RST::UNIT [q]q,DSPI!**.
10. Enter **DGN::NPC <npc No.>,SIDE s!** for subject NPC number and side.
 - If DGN ...STF message is received, continue with Step 11.
 - If DGN ...STF message is not received, proceed to Step 15.
11. Enter **RMV::UNIT [q]q,UC!**, replace CPU, and enter **RST::UNIT [q]q,UC!**.
12. Enter **DGN::NPC <npc No.>,SIDE s!** for subject NPC number and side.
 - If DGN ...STF message is received, continue with Step 13.
 - If DGN ...STF message is not received, proceed to Step 15.
13. Perform one of the following (use appropriate commands for the type of frame):
 - If the original failure occurred immediately after a cross-connection was entered, try replacing the involved ETSIs/TSIs. Enter **RMV::ETSI sqq!** or **RMV::TSI sft!**, replace the ETSI/TSI pack, and enter **RST::ETSI sqq!** or **RST::TSI sft!**. The involved ETSI(s)/TSI(s) are those on the same side as the NPC and the unit(s) containing the NPC(s) in the cross-connection.
 - If failure cannot be related to cross-connection, enter commands to individually remove and restore the ETSIs/TSIs on the inactive side and look for failed diagnostics.

14. Enter **DGN::NPC <npc No.>,SIDE s!** for subject NPC number and side.
 - If DGN ...STF message is received, obscure problem; contact technical consultant. After trouble is cleared, enter command to restore NPCs to service.
 - If DGN ...STF message is not received, continue with Step **15**.
 - If message gives a trouble number in the range STF 0F03 through 0F06 and optional second line with UPN and XPN numbers, proceed to Step **16**.
15. Enter **RST::NPC <npc No.>,SIDE s!** for the first NPC (if NPC pair) and side.
 - If RST ...COMPL message is received, this procedure is completed.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
16. From Table 5-6, identify the faulty cable connecting to the subject NPC by the UPN (unit plug number) and XPN (ECCN plug number) named in the message. Notice that the ECCN plug number includes the unit number.

Table 5-6. Cable Identification

Unit Plug	ECCN Plug	Side	Direction	Involved DSP Plug-In
P1	P<unit>A	0	Receive	1st & 2nd DSP
P2	P<unit>E	0	Transmit	1st & 2nd DSP
P3	P<unit>B	0	Receive	3rd & 4th DSP
P4	P<unit>F	0	Transmit	3rd & 4th DSP
P5	P<unit>C	0	Receive	5th & 6th DSP
P6	P<unit>G	0	Transmit	5th & 6th DSP
P7	P<unit>D	0	Receive	7th & 8th DSP
P8	P<unit>H	0	Transmit	7th & 8th DSP
P10	P<unit>A	1	Receive	1st & 2nd DSP
P11	P<unit>E	1	Transmit	1st & 2nd DSP
P12	P<unit>B	1	Receive	3rd & 4th DSP
P13	P<unit>F	1	Transmit	3rd & 4th DSP
P14	P<unit>C	1	Receive	5th & 6th DSP
P15	P<unit>G	1	Transmit	5th & 6th DSP
P16	P<unit>D	1	Receive	7th & 8th DSP
P17	P<unit>H	1	Transmit	7th & 8th DSP

17. Replace (or have repaired) the cable identified above. The unit and ECCN plug numbers are stamped alongside the connectors on the ECCN panel; see Figure 5-5.
18. Enter **RST::NPC <npc No.>,SIDE s!** for the first NPC (if NPC pair) and side.
 - If DGN ...STF message is received (see Note), obscure problem; contact technical consultant. After trouble is cleared, enter command to restore NPCs to service.

⇒ NOTE:

The diagnostic reports one cable problem at a time; so if different UPN and XPN numbers occur, clear that trouble before contacting the technical consultant.

- If RST ...COMPL message is received, this procedure is completed.
- If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.

(LEFT SIDE OF ECCN PANEL)							
P3A	P3B	P3C	P3D	P3E	P3F	P3G	P3H
P4A	P4B	P4C	P4D	P4E	P4F	P4G	P4H
P6A	P6B	P6C	P6D	P6E	P6F	P6G	P6H
P9A	P9B	P9C	P9D	P9E	P9F	P9G	P9H
P10A	P10B	P10C	P10D	P10E	P10F	P10G	P10H
P12A	P12B	P12C	P12D	P12E	P12F	P12G	P12H
P15A	P15B	P15C	P15D	P15E	P15F	P15G	P15H
P16A	P16B	P16C	P16D	P16E	P16F	P16G	P16H
B O T T O M	P17A	P17B	P18A		P19		
	P14A	P14B	P14C	P14D	P14E	P14F	P14G
	P14H						
	P13A	P13B	P13C	P13D	P13E	P13F	P13G
	P13H						
	P11A	P11B	P11C	P11D	P11E	P11F	P11G
	P11H						
	P8A	P8B	P8C	P8D	P8E	P8F	P8G
	P8H						
	P7A	P7B	P7C	P7D	P7E	P7F	P7G
	P7H						
	P5A	P5B	P5C	P5D	P5E	P5F	P5G
	P5H						
	P2A	P2B	P2C	P2D	P2E	P2F	P2G
	P2H						
	P1A	P1B	P1C	P1D	P1E	P1F	P1G
	P1H						
(RIGHT SIDE OF ECCN PANEL)							

Figure 5-5. Cable Connectors on ECCN Panel

Primary Memory (PMEM) Card Failure Recovery Procedure

The recovery procedure when a PMEM card failure occurs is as follows:

1. Perform the following diagnostic tests on both the PMEM and SMEM cards:
 - a. Do the card diagnostic test, craft code X'0004.
 - b. Do the validate data base test, craft code X'0010.
 - c. Validate the boot block, craft code X'0020.
 - d. Validate executable header, craft code X'0040.
 - e. Validate executables, craft code X'0080.

Several possible cases can result from this set of tests that lead to different actions to resolve the problems:

- a. If the PMEM card fails card diagnostics and the SMEM card passes all tests, then go to Step 2.
 - b. If the PMEM card succeeds on the card diagnostic test, but fails any of the other tests, while the SMEM card succeeds on all tests, then go to Step 3.
 - c. If the PMEM and SMEM card both succeed on the card diagnostic tests, but both fail on one of the other diagnostic tests, then go to Step 4.
 - d. If the SMEM card fails card diagnostics and the PMEM card passes all tests, then go to Step 5.
 - e. If the SMEM card passes card diagnostics, but fails any of the other tests, while the PMEM card succeeds on all tests, then go to Step 6.
2. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to be defective):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service..
 - c. Replace the PMEM card with the card currently in the SMEM slot.

- d. Insert a spare memory card into the SMEM slot.
- e. Physically insert the CPU2 pack into the frame.
- f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
- g. The System should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, discard the bad PMEM card and continue with Step 7.

If PMEM fails to boot, run diagnostics on the PMEM card. The card diagnostic tests (craft code X'0004) will most likely fail, because the problem is most likely a PMEM card connector problem and the CPU2 board itself should be replaced. The system should be rebooted with the PMEM and SMEM cards in their original slots but with a new CPU2 pack.

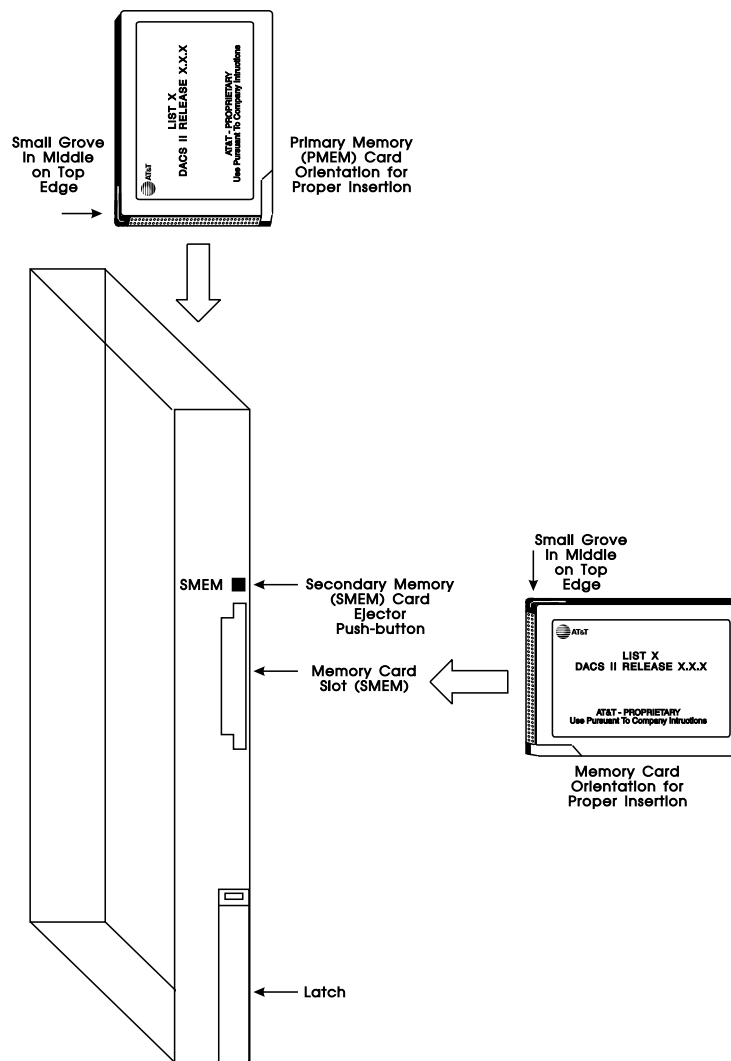


Figure 5-6. Memory Card Locations on CPU2

3. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the card currently in the SMEM slot.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The system should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, continue with Step 7. (The old PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card (Figure 8-2) with the most recently archived memory card by doing the following (PMEM and SMEM cards are suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the most recently archived memory card.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The System should be brought into service with the correct version of the executables and a valid but most likely not current database. If the boot completes successfully, continue with Step 7. (The PMEM card and the SMEM card may be recycled as future SMEM cards.)

5. Replace the SMEM card (Figure 8-3) with a spare memory card or with an older archive card that may be recycled. (SMEM card is suspected to be defective.):
 - a. Remove the SMEM card physically from the CPU2 card. (Since the card has been found to be defective by the system, it must already be logically removed from the system.)
 - b. Insert the spare memory card physically into the SMEM slot.
 - c. Discard the bad SMEM card and continue with Step 7.
6. The SMEM card is good but has bad information on it.
Restore the SMEM card:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a "mirrored image" of the other.

RST : : SMEM, BKGRND !

If the command is denied because of bad or mismatching information on the SMEM card with the message:

Warning: The SMEM Card being restored has the following problems!
<message describing the problem>
If YOU STILL WISH TO PROCEED, USE FRC OPTION

Then use the command with the **FRC** option:

RST : : SMEM, FRC, BKGRND !

You will get a response:

ARE YOU SURE? (YES/NO)

Answer YES and the restore operation should complete. Then go to Step 8.

7. To restore the SMEM card, enter the following command:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a “mirrored image” of the other.

RST : : SMEM, BKGRND !

8. If there is now a replacement card in the PMEM slot, then the PMEM may not contain the latest db changes, depending on which replacement card was used. Any changes not present need to be re-done.
9. Create a new archive copy if needed (archived copy was used to replace the PMEM). Refer to the "Database Archive Procedure" (Volume 1).

Clear Failed Link Diagnostic

1. If the alarm cutoff is not already operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Repeat the diagnostic for the failed link (which is named in the original failed DGN message). Enter the command from another link as follows:
DGN : :LINK j!

Where: j = Link number (1 through 6).

3. If DGN LINK ...STF 0300 message is received, it means that the clock signal is not received on the synchronous link. So, verify wiring connections to the link at the back of the frame.
 - If DGN LINK ...STF message is not received, there is no problem at this time. If intermittent trouble recurs and another DACS II link is available, move the data link connections to the next link and set the link parameters.
4. Enter the diagnostic command for other links to determine if CI, ECI, or HECI must be replaced.
5. If DGN LINK ...STF message is received for any other link, enter **RMV : :MC!**.
 - If DGN LINK ...STF message is not received for any other link, proceed to Step 8.
6. Replace the CI, ECI, or HECI (high-speed) pack, whichever is installed in the MC, with the same type.
7. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
8. If another DACS II link is available, move the data link connections from the failed link to the next available link and set the link parameters.
9. Make a record of the failed link stating that the CI, ECI, or HECI pack in the main controller must be replaced (using the method in this procedure) if the failed link will be needed or at the time of the next reset of the MC.

Clear Failed CCB Diagnostic

Overview: This procedure deals with a failed CCB (cross-connect buffer) diagnostic. When a CCB pack fails, the associated unit FC packs and network TSI packs may also be taken out-of-service autonomously; so, utility queries are used to check for associated packs that must be restored to service. Conversely, a failure of a TSI on one of the CCB ports can cause the CCB to fail its diagnostic. When that happens, the accompanying ERR, ESR ...CCB message is used to identify the failed TSI.

1. If the alarm cutoff is not already operated, enter **UTL : :ACO!**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the CCB has not been removed from service (RMV CCB COMPL or RST CCB DNY in printout), enter **RMV : :CCB sf!**

Where:

s = Side (0 or 1)

f = CCB number (1 through 6).

3. Enter **RMV : :TSIS,UNIT q,CCN s!** with the same unit and side as the failed CCB.
4. Locate trouble number that appears after the DGN ...STF keyword in the trouble printout.
 - If trouble number 0200 or 0300 is received, continue with Step 5.
 - If other trouble number is received, proceed to Step 7.

⇒ NOTE:

The STF 0200 and 0300 failures indicate a port alarm received from an associated TSI which can be failed or just unplugged.

5. Enter **RST : :CCB sf!** for the subject CCB.
6. Enter **RST : :TSI sft!** for each TSI associated with the subject CCB. If any diagnostic fails, replace that TSI pack and restore the replacement.

Proceed to Step 15.

7. Replace CCB pack (UM26 code) identified in the failed diagnostic message. There are six CCB slots on each side of the cross-connect network, one for each DACS II unit.
8. Enter **DGN::CCB sf!**
 - If DGN ...STF message is not received, proceed to Step 15.
9. Enter **RMV::CCNI s!** where: s = failed side (0 or 1).
10. Replace the CCNI pack (UM30 code) for the same CCN side.
11. Enter **RST::CCNI s!** where: s = side 0 or 1.
12. Enter **DGN::CCB sf!**
 - If DGN ...STF message is NOT received, proceed to Step 15.
13. Locate the ERR ESR CCB message that appears in the original trouble printout and the eight raw data bytes in that message. The data bytes are on the second line of the output message.
 - If none of the first 3 data bytes have nonzero characters, check CCB slot and backplane for damage. If no wiring problem is found, contact technical consultant.
 - If any of the first 3 data bytes equal 0100 or 0200, there is a timing signal loss or clock error at the CCB. Check the backplane wiring for bent pins or broken leads at the CCB. If no wiring problem exists, check trouble printout for SYNC messages.
 - If any of the first 3 data bytes have some other nonzero value, use Table 5-7 to determine the related TSI From-Unit identification from one of the first 3 data bytes (referred to as data1, data2, and data3).

⇒ NOTE:

The To-Unit identification and side for the complete TSI "stf" number are already known from the failed CCB. The bus numbers refer to the connections to the 4 FTMs or DSPU ports.

Table 5-7. TSI Ports on CCB

Byte	Specific Position Value	TSI From-Unit ID
ESR0 (data 1)	xx8x	2 (bus 1)
	xx4x	1 (bus 1)
	xx2x	6 (bus 0)
	xx1x	5 (bus 0)
	xxx8	4 (bus 0)
	xxx4	3 (bus 0)
	xxx2	2 (bus 0)
	xxx1	1 (bus 0)
ESR1 (data 2)	xx8x	4 (bus 2)
	xx4x	3 (bus 2)
	xx2x	2 (bus 2)
	xx1x	1 (bus 2)
	xxx8	6 (bus 1)
	xxx4	5 (bus 1)
	xxx2	4 (bus 1)
	xxx1	3 (bus 1)
ESR2 (data 3)	xx8x	6 (bus 3)
	xx4x	5 (bus 3)
	xx2x	4 (bus 3)
	xx1x	3 (bus 3)
	xxx8	2 (bus 3)
	xxx4	1 (bus 3)
	xxx2	6 (bus 2)
	xxx1	5 (bus 2)

14. Enter **RMV::TSI sft!** for that TSI, replace it, and enter **RST::TSI sft!**.
15. Enter **RST::CCB sf!** for the subject CCB.
16. Enter **UTL::QRY,OOS,UNIT q!** and **UTL::QRY,OOS,COMMON!** and check the unit FC and network TSI portions to determine if any are removed from service.

Where: q = Involved DACS II unit (1 through 6).

17. If any FCs are out-of-service, enter command to restore each one as follows: **RST::UNIT q,FC sf!**.

Where:

q = Unit number (1 through 6)

sf = FC number consisting of side (0 or 1) and
FC number in unit.

18. If entire network side is out-of-service, enter the command **RST::TSIS,CCN s,UNIT q!** for the subject side and unit; otherwise, enter command to restore each TSI as follows, **RST::TSI sft!**.

Controller and Link Troubles

6

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This chapter contains the procedures to clear various main controller troubles including the communication interface (for administrative link).

⇒ NOTE:

If you already have isolated the trouble to one of the troubles in this chapter, proceed directly to the procedure for that trouble; otherwise, go to *Trouble Identification* to first isolate the trouble.

The following equipment considerations pertain to the controller and link troubles.

- The trouble-clearing in this chapter involves the replacement of the main controller plug-ins. If the main controller is still operative, it must be removed from service before making the replacement. When the replacement is plugged in, the frame may be automatically reset. However, the manual reset is always used to ensure uniform completion conditions.
- The frame reset is referred to as a cold boot of the frame circuits and memories; whereas, the boot command is referred to as a warm boot. Both these operations can take from 3 minutes to over 30 minutes depending on how the frame is equipped and the source of the boot (PMEM or SMEM). In-progress messages will be issued every 20 seconds.

Clear Processor Failure Alarm

1. If a reset is in progress, wait to see if the LED goes off after the reset completes. If the LED remains lighted, this trouble procedure is applicable. The processor failure is lighted during the frame reset sequence.
2. If the alarm cutoff is not operated, try pressing the **ACO** button on the DACS II status panel.
3. Check the power units located in the MC (main controller) for a lighted failure LED on any power unit.
 - If an LED is lighted, replace the power unit and close the latch/switch.
 - If an LED is not lighted, proceed to Step 6.
4. If the LED on the replacement lights, clear wiring trouble between the associated 48-volt fuse and the power unit per SD-96699-01.
5. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If the reset completes and the LED goes out, you have completed this procedure.
 - If the LED is lighted, contact technical consultant for assistance in clearing the trouble.
6. Check printout for recent ERR SOFTWARE message.
 - If recent ERR SOFTWARE message occurred, refer to *Software Error* to clear the error.
 - If recent ERR SOFTWARE message did not occur, continue with Step 7.
7. Check to see if MC is in maintenance condition (MCOND ...COMPL in printout).
 - If MC is in MCOND state, continue with Step 8.
 - If MC is not in MCOND state, proceed to Step 10.
8. Check printout to locate ERR message for MC, PMEM, or SMEM.
9. Enter DGN command for that entity (for example, DGN::MC!).
 - If DGN ...STF message is received, go to Section 5.1 to clear the failed diagnostic.

10. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If the FAILURE alarm goes off after the reset sequence completes, you have completed this procedure.
 - If the FAILURE alarm does not go off, check printout for MC packs named (**CPU2**, **CI**, **EBX**, and the **EMTC**) in an output error message.
11. If any MC pack is named, replace that pack.
 - If MC pack is not implicated, contact technical consultant for assistance.
12. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If processor LED goes off after the reset completes, you have completed this procedure.
 - If processor LED does not go off, repeat the sequence to replace the next MC pack in an output message until all the MC packs have been replaced.
13. If the trouble persists after all the MC packs have been replaced, check for backplane wiring or plug-in connector trouble.
 - If no pack or wiring trouble is found, contact technical consultant for assistance in clearing the trouble.

Clear Frame Startup Trouble

Overview: This procedure is used when the DACS II reset operation fails. During the reset, the controller packs (CI, MP, and MTC) and the frame unit UCs are initialized, internal communication networks are established, and programs are transferred from the PMEM or SMEM to the respective packs. Depending on the degree to which the frame is equipped, the reset can take up to 30 minutes (from memory card) to complete. The RST MC command initiates the same operations as the frame reset except that the unit UCs are not rebooted.

NOTE:

The terminal must be set at 1200 baud rate to read the information as it scrolls on the screen.

1. If there has been recent installation or maintenance activity on the backplane, check behind the MC to verify that wiring loops are installed at connectors CPU2 and CI. Be careful when removing the metal shield so as not to damage other wiring. The wiring loops (green wires) are on plugs at the CPU2 and CI connectors which are at the bottom center of the MC backplane (on the CEF).
2. At back of frame, disconnect the administrative link cables (except link 1) from the main controller and tag them for correct installation after the trouble is cleared.
3. Retry the reset as follows. On the DACS II status panel, hold **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If reset does not proceed beyond CI/ECI/HECI startup, replace the CI, ECI, or HECI, whichever is installed in the MC, with the same type and reset the frame again.
 - If any STARTUP STF message is received, replace the implicated pack as follows:
 - For MP, replace CPU2 (TM778) in main controller.
 - For CI/ECI, replace CI (TM658C), ECI (TM736C), or HECI (TM762).
 - For EBX, replace EBX (UM71) or BX2 for non-CEF (UM72).
 - For EMTC or MTC, replace EMTC (UM75) or MTC plug-in.

- If the reset completes with no conditions (COND), no error explanations, you have completed this procedure. Reconnect link cables.
 - If the reset completes with conditions (COND), with error explanations, go to Section 7.2 to clear reset completed conditionally.
 - If **BOOT FAILED; BAD BOOT DEVICE** message is received, refer to Section 6.4 to clear the trouble.
 - If **SOFTWARE ID BLOCK CHECK FAILED** message is received, proceed to Step 6.
 - If **BOOT IN PROGRESS (continues for more than 45 minutes)** message is received, continue with Step 4.
 - If **other** message is received, check the trouble printout for other messages. If there are no other messages or trouble indications to work with, contact technical consultant.
4. Attempt to clear the trouble by replacing the circuit packs listed below (which have not already been replaced) one at a time and by checking the reset sequence. If software is being loaded from SMEM, try using the other source memory card and resetting the frame.
 - For MP, replace CPU2 (TM778) in main controller.
 - For CI/ECI, replace CI (TM658C), ECI (TM736C), or HECI (TM762).
 - For EBX, replace EBX (UM71) or BX2 for non-CEF (UM72).
 - For EMTC or MTC, replace EMTC (UM75) or MTC plug-in.
 5. If trouble persists or other trouble messages are received, contact regional technical consultant for assistance in clearing the trouble.

6. From Table 6-1, determine the meaning of the condition (COND) code in the trouble message.

Table 6-1. Software ID Condition Codes

Code	Meaning
20	Software ID block cannot be read
21	Software ID block failed comparison

7. If you suspect that the wrong memory card was installed, install the correct memory card as shown in the following steps.
 - a. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.
 - b. Replace the failed PMEM memory card with the most recent SMEM memory card (this may be the one currently installed in the SMEM slot on the CPU2).
 - c. Insert a spare memory card in the SMEM slot.
 - d. Physically insert the CPU2 back into the slot.
 - e. On the Status Panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - f. To restore the SMEM card, enter the following command:

RST : : SMEM, BKGRND

Clear RESET TOD/DATE Message

Overview: This procedure deals with clearing ALM RESET TOD/DATE messages which indicate that the TOD (time of day) or date or both have been adjusted after a frame reset or MC restoral. The date is recovered from the SMEM and the time is obtained from the real-time clock in the CI, ECI, or HECI pack. When these RESET messages are accompanied by a minor alarm, it indicates that the recovered values are suspect and must be set manually. The date must always be set because the SMEM may not be up-to-date.

1. If the alarm cutoff is needed because of the ALM RESET message, enter **UTL::ACO!**.
2. Locate the system time and date that appear on the line following the <Date ...year> <Time ...day> explanatory line. The format of the date is modayr and the format of the time is hrnmns.
3. Check these times against the actual times.



NOTE:

Enter **UTL::QRY, DATE!** to display the time again.

4. Does either time or date need to be reset?

- If the time needs to be reset, enter **UTL::TOD hhmmss!** to set the correct time.

Where:

hh = Hour (00 through 23)

mm = Minutes (00 through 59)

ss = Seconds (00 through 59).

- If the date needs to be reset, enter **UTL::DATE {moda[ce]yy|ddmm[ce]yy}[, FORMAT ggg][, INT bb]!** to set the correct date.

Where:

dd = Day (01 through 31)

mm = Month (01 through 12)

ce = Optional, for different century

yy = Last 2 digits of year (00 through 99, default is 86)

ggg = MDY for month, day, year format or DMY for day, month, year format.

INT bb = Optional, to set interval at which the date will be printed, 01, 02, 04, 06, 08, 12, or 24 hours (default).

Clear Overload Message

1. If UNIT [q]q,UC OVERLOAD wording appears in the message, verify that the UBX pack is installed in the unit.
 - If UNIT [q]q,UC OVERLOAD wording does not appear in the message, proceed to Step 4.
2. Enter **RST: :UNIT [q]q,UC!** to restore subject unit.

Where: [q]q = Unit number (1 through 16) named in OVERLOAD message.

- If DGN ...STF message is received, refer to *Manual Diagnostic Failures* to clear the trouble.
 - If OVERLOAD UNIT or RL response is obtained again when frame is used, replace UBX plug-in, and enter **RST: :UNIT [q]q,UC!**.
 - If OVERLOAD UNIT or RL response is not obtained again when frame is used, you have completed this procedure.
3. If trouble persists, check unit backplane and pins, and contact technical consultant if no wiring trouble is found.
 4. If MJ and processor FAILURE LEDs are lighted on the DACS II status panel, refer to Section 6.1.
 - If those LEDs are not lighted, continue with Step 5.
 5. Determine which pack is implicated from the MP or CI designation in the OVERLOAD message. The MP designation means the CPU2 in the main controller and the CI means the CI in the main controller. The status panel FAILURE LED (which has its own trouble-shooting procedure) will be lighted with the OVERLOAD MC message.
 6. Enter **RMV: :MC!**. If command cannot be completed, continue with Step 7.
 7. Replace the MC pack implicated from the OVERLOAD message.
 8. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If the trouble is cleared, this procedure is completed.
 - If the trouble persists, contact technical consultant for assistance.

Clear Inoperative Terminal (System Hung)

⇒ NOTE:

If trouble is found in any of the preliminary checks, discontinue the procedure.

1. Make the following checks:
 - Terminal connected to power outlet and power switch on.
 - Terminal connected to TTY connector at DACS II, either directly or via data sets.
 - Terminal passes its own self-tests.
 - Terminal is properly optioned and set to the proper baud rate for the link to which it is connected.
2. Verify that the correct ED-2C646-30 adapter is used to connect the data link to the DACS II.
 - Use a G1 (group 1) or G14 adapter for any interface via data sets (asynchronous or synchronous).
 - Use a G2 or G15 adapter for a direct TTY or CRT terminal (without data sets).
 - Use a G3 or G8 adapter for local operations systems such as SARTS (Switched Access Remote Test System) or TABS (telemetry asynchronous block serial) protocol link (asynchronous 4-wire – data only without data sets).

⇒ NOTE:

The G1 and G2 adapters interoperate with RS232C per EIA Pub. 12 and give maximum receiver margin and minimum pulse distortion. The G14 and G15 adapters contain termination and biasing networks to detect disconnected or unpowered RS232C equipment. The G1 and G2 adapters are recommended for use in normal installations where the equipment remains powered up.

3. Determine if the terminal will work with the printer shut off (failed printer can hang up the terminal); also, reset the terminal by turning it off, then on again.

4. If other links to DACS II are working, from another link, enter
UTL : : QRY, STR, LINK j [mm] !

Where:

j = Suspected link
mm = Optional virtual circuit (synchronous).

- If other links to DACS II are not working, proceed to Step 10.
5. Read the output message per Figure 6-1 to verify that the link baud rate matches the terminal and to check other link status. Mismatched baud rates cause garbled characters to be printed.
 - If the link baud rate does not match the terminal baud rate, enter
ADD : : LINK j, PTCOL {S|T}, BAUD bb[, ALM k][, BS e][, INIT] !
and you have completed this procedure. (Refer to Section 6.8 for the procedure to establish the link.)

ASYNCHRONOUS

M...UTL QRY STR LINK j PTCOL S 2LN MSG:
 STATUS bb e k q m p x hh COMPL

SYNCHRONOUS**PACKET LAYER FORMAT**

M...UTL QRY STR LINK j[mm]PTCOL X 4 LN MSG:
 STATUS bb e k m p hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL <X.25 PACKET LAYER parameters> <VC ranges (ppss)> <VC grps (gghh)>

LINK LAYER FORMAT

M...UTL QRY STR LINK j PTCOL X 4 LN MSG:
 STATUS bb e k m FFFF hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL T20 R20 <VC ranges> <VC groups>

 PTCOL = link protocol (Snider/X.25)

 <X.25 Link Layer Parameters>
 k T1 T3 N2

 <X.25 Packet Layer Parameters>
 T20 R20
 W P T20 T22 T23 T25 T26 R20 R22 R23 R25 (for Virtual Circuit, e.g., 501)

STATUS:

- e = 0 for true backspace or 1 for underscore backspace or dash (—) for synchronous. link (no backspace option).
- m = 0 (idle), 1 (input message), or 2 (output message)
- bb = Baud rate (03, 06, 12, 24, 48, or 96) or 00 for synchronous link (baud not detectable)
- FFFF = For X.25 links, when a specific virtual circuit number is NOT entered, the protocol field is 4 HEX characters (16 bits of information), each bit representing a specific virtual circuit. Each HEX character can contain a value from 0 - F. All zeros indicates all 16 virtual circuits are active. All ones indicates all 16 virtual circuits are not active.
- hh = 03 (hardware in-service) or 04 (hardware out-of-service)
- k = 1 (link alarm defined as minor) or 2 (defined as major)
- q = ENQ/ACK protocol 0 disabled, 1 enabled (default)
- x = XON/XOFF protocol 0 disabled (default), 1 enabled.
- ppss = Number of permanent and switched virtual circuits (00-16)
- gghh = Permanent and switched virtual circuit groups (00-15)

Figure 6-1. Link Status Register

6. Enter **DGN::LINK j!** (where **j** is the original link that failed).
 - If DGN LINK ...STF message is received, refer to *Manual Diagnostic Failures* to clear link diagnostic failure.
7. If other links are working, try removing the inoperative link and restoring it to service again as follows:
RMV::LINK j! and **RST::LINK j!**
8. On suspect link, try entering **UTL::QRY,WHO!** to see if DACS II can now execute commands.
 - If DACS II can execute commands, this procedure is completed.
9. If the inoperative link uses data sets, check data sets by connecting to a different link (if one is available and correctly provisioned in the data base). Alternatively, you can try replacing the data set. Data set specifications are found in the information notes of SD-96699-01.
10. At back of the frame, disconnect the administrative link cables (except link 1) from the main controller and tag them for correct installation after the trouble is cleared.
11. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button. Watch for messages to see if the reset completes.
 - If the link is now operative, this procedure is completed.
12. Proceed as follows:
 - If DACS II is responding with **RL**, go to Section 6.7.
 - If DACS II is not responding at all (no character echo), replace the CI, ECI, or HECI pack in the MC.
 - If trouble persists, replace each of the following plug-ins one at a time and check if the link is operative after the reset completes.
 - For MP, replace CPU2 (TM778) in main controller.
 - For EBX, replace EBX (UM71) or BX2 (UM72).
 - For EMTC or MTC, replace EMTC (UM75) or MTC plug-in.
 - If trouble persists, contact technical consultant for assistance.

Clear Repeated RL Command Response

1. If **RL** appears on the command line after the command is entered, reenter the command. If RL is received again, enter **UTL : :QRY,WHO!** to see if trouble persists with different command.
 - If RL persists, continue with Step 2.
 - If the trouble goes away, you have completed this procedure.
2. Check processor FAILURE LEDs status.
 - If MJ and processor FAILURE LEDs are lighted on the DACS II status panel, refer to Section 6.1.
3. Check printout for OVERLOAD message.
 - If OVERLOAD message is present on the printout, refer to Section 6.5.
4. On DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - After the reset completes, if DACS II can execute commands, this procedure is completed.
 - After the reset completes, if DACS II cannot execute commands, contact technical consultant for assistance.

Establish Administrative Link at DACS II

Overview: This procedure is used to prepare DACS II links for connections. There are six links available for connection of terminal equipment and operations systems. With the ECI (TM736C), links 5 and 6 are synchronous links using X.25 protocol (through level 3) at rates up to 9.6 kb/s. The HECI (high-speed, TM762) extends the rate up to 56 kb/s. Up to 16 virtual circuits can be established on each synchronous link. The characteristics of each link can be changed from the defaults provided by DACS II using the ADD commands herein. The ECI or HECI is required for TABS (telemetry asynchronous block serial) links.

1. If data sets (such as 202T) are required for remote connections or for equipment more than 50 feet (RS-232C specification) or 2000 feet (RS-449 specification, 1200 baud) away, verify that data sets have been installed. Data set specifications are given with the information notes in SD-96662-01.
2. Connect data link cable (for example, M25B) to the TTY connector for the link (behind DACS II main controller). No adapter is required for RS-449 format, but ED-2C646-30 adapters are required for RS-232C format as follows:
 - Use a G1 (group 1) or G14 adapter for any interface via data sets (asynchronous or synchronous).
 - Use a G2 or G15 adapter for a direct TTY or CRT terminal (without data sets).
 - Use a G3 or G8 adapter for local operations systems such as SARTS (Switched Access Remote Test System) or TABS (telemetry asynchronous block serial) protocol link (asynchronous 4-wire – data only without data sets).

⇒ **NOTE:**

The G1 and G2 adapters interoperate with RS232C per EIA Pub. 12 and give maximum receiver margin and minimum pulse distortion. The G14 and G15 adapters contain termination and biasing networks to detect disconnected or unpowered RS232C equipment. The G1 and G2 adapters are recommended for use in normal installations where the equipment remains powered up.

3. What type of link is being established?
 - If **ASYNCHRONOUS**, continue with Step 4.

- If **TABS**, proceed to Step 5.
- If **SYNCHRONOUS**, proceed to Step 6.

4. Enter the appropriate command to initialize the link or make changes:

**ADD::LINK j,PTCOL S[,BAUD bb][,ALM k][,BS e]
[,ENQ q][,XON][,INIT]!**
or **ADD::LINK j,PTCOL {S|M}[,ALM k][,INIT]!**

Where:

- j = Physical link number (1 through 6)
- S|M = Asynchronous Snider (S) protocol or Modified (M) Snider for *SLC* Series 5 carrier system; only one of the 6 links can be set for modified Snider.
- bb = Baud rate; 03, 06, 12, 24, 48, or 96 for rate of 300, 600, 1200, 2400, 4800, or 9600; default is 1200
- k = Alarm class; k = 2 for major alarm for link hardware failure, or k = 1 for minor alarm (default)
- e = Backspace; e = 1 for backspace indicated by underscore or e = 0 to actually move cursor backward for backspace (default)
- ENQ q = To enable/disable ENQ/ACK acknowledgement protocol to match terminal requirement; q = 0 to disable or x = 1 enable (default).
- XON x = To allow use of CTRL S and CTRL Q commands to temporarily stop and start long output messages; x = 0 to disable (default) or x = 1 to enable.
- INIT = Optional, to initialize all parameters to default values except for those parameters entered in the command.

Proceed to Step 10.

5. Enter the following commands to make required settings:

ADD::LINK j,PTCOL T,BAUD bb!

ADD::LINK j,APPL {ASCS|ASCD|PM}[,L2AD aa][,POLL ttt]!

Where:

j = Physical link number (3 or 4)

T = TABS protocol

bb = Baud rate (24 for 2400)

ASCS, ASCD, = Selects application as follows:

or PM alarm surveillance and control summary or
detailed, or performance monitoring.

ttt = Optional, to specify polling time as follows:

001 through 255 for ASCS or ASCD applications.

aa = Optional, to specify Layer 2 address (00 through 31).

Proceed to Step 10.

6. To initialize the link or change alarm class, enter

ADD::LINK j,PTCOL X[,ALM k][,INIT]!

Where:

j = Physical link number (5 or 6)

PTCOL X = X.25 synchronous link protocol

k = Alarm class; 2 for major alarm for link hardware
failure or 1 for minor alarm (default)

INIT = Optional, to initialize all parameters to default values
except for those parameters entered in the command.

7. Enter **UTL::QRY,STR,LINK j[mm]!** to see the existing (or default) link parameter values (see Table 6-2). The link must be removed from service to change parameters. See Figure 6-2.

8. To enter different **data layer** values, list the subject parameter followed by the value (for example, K-5). Enter the command as follows:

ADD::LINK j[mm][,<param> <value>,...][,FRMAD {A|B}]!

Where:

j = Physical link number (5 or 6)

mm = Permanent virtual circuit (01 through 16) on same link

<param> <value> = **Data layer** parameter (K, T1, T3, N2) and value
obtained from associated portion of Table 6-2

FRMAD {A|B} = Frame address in X.25 layer; default is A.

9. To enter different **packet layer** values, list the subject parameter followed by the value (for example, R20-nn) and use commas to separate parameter entries. Enter the command as follows:

ADD::LINK j[mm][,<param> <value>,...][,VC(ppss,gghh)]!

Where:

j = Physical link number (5 or 6)

mm = Permanent virtual circuit (01 through 16) on same link

<param> = One of the **packet layer** parameters of Table 6-2 for which different values are to be specified; identified by designation (for example, T20)

<value> = Value of named parameter

ppss = Virtual circuit ranges (00 through 16) for permanent (pp) and switched (ss) VCs; defaults are pp = 08 and ss = 08

gghh = Virtual circuit groups (00 through 15) for above ranges; defaults are gg = 00 and hh = 00.

10. If denial COND 04 (link out-of-service) is received, enter **RST::LINK j[mm]!** and reenter the ADD command. Denial COND 03 means that the link must first be removed from service to change parameters.
11. Verify that any administrative terminal to be connected to the link is set to the following major characteristics: Full Duplex, 7/8-Bit ASCII, Even Parity, Answerback (if link is provisioned for ENQ/ACK) and same Baud Rate. Complete terminal specifications are found in the information notes of SD-96658-01.
12. If you are adding the link to service, enter **RST::LINK j[mm]!** to complete this procedure. Procedures to change the link language, NPC addressing, and output message screening are contained in *Provisioning*, Volume I.

ASYNCHRONOUS

M...UTL QRY STR LINK j PTCOL S 2LN MSG:
 STATUS bb e k q m p x hh COMPL

SYNCHRONOUS**PACKET LAYER FORMAT**

M...UTL QRY STR LINK j[mm]PTCOL X 4 LN MSG:
 STATUS bb e k m p hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL <X.25 PACKET LAYER parameters> <VC ranges (ppss)> <VC grps (gghh)>

LINK LAYER FORMAT

M...UTL QRY STR LINK j PTCOL X 4 LN MSG:
 STATUS bb e k m FFFF hh
 LNKL <X.25 LINK LAYER parameters> <frame addressing>
 PKTL T20 R20 <VC ranges> <VC groups>
 PTCOL = link protocol (Snider/X.25)
 <X.25 Link Layer Parameters>
 k T1 T3 N2
 <X.25 Packet Layer Parameters>
 T20 R20
 W P T20 T22 T23 T25 T26 R20 R22 R23 R25 (for Virtual Circuit, e.g., 501)

STATUS:

- e = 0 for true backspace or 1 for underscore backspace or dash (—) for synchronous.
link (no backspace option).
- m = 0 (idle), 1 (input message), or 2 (output message)
- bb = Baud rate (03, 06, 12, 24, 48, or 96) or 00 for synchronous link (baud not detectable)
- FFFF = For X.25 links, when a specific virtual circuit number is NOT entered, the protocol field is 4 HEX characters (16 bits of information), each bit representing a specific virtual circuit. Each HEX character can contain a value from 0 - F. All zeros indicates all 16 virtual circuits are active. All ones indicates all 16 virtual circuits are not active.
- hh = 03 (hardware in-service) or 04 (hardware out-of-service)
- k = 1 (link alarm defined as minor) or 2 (defined as major)
- q = ENQ/ACK protocol 0 disabled, 1 enabled (default)
- x = XON/XOFF protocol 0 disabled (default), 1 enabled.
- ppss = Number of permanent and switched virtual circuits (00-16)
- gghh = Permanent and switched virtual circuit groups (00-15)

Figure 6-2. Link Status Register

Table 6-2. Synchronous Link Level Parameters

Parameter Designation	Meaning	Value Range	Default
Data Layer Values			
N2	Frame Transmission Attempts	2 through 16	7
K	Window Size	1 through 7	7
T1	Acknowledgment Timer	2 through 20 seconds	3
T3	Idle Channel Timer	4 through 120 seconds	26
Packet Layer Values			
W	Window Size	1 through 7	2
P	Packet Size	128 through 512 octets	128
R20	Restart Retries	1 through 10	1
R22	Reset Retries	1 through 3	1
R23	Clear Retries	1 through 10	1
R25	Data Retransmissions	0 through 3	0
T20	Restart Timer	10 through 180 seconds	180
T22	Reset Timer	10 through 180 seconds	180
T23	Clear Timer	10 through 180 seconds	180
T25	Data Acknowledgment Timer	10 through 200 seconds	200
T26	Interrupt Confirmation Timer	10 through 180 seconds	180

Note: The following timers are not supported by DACS II:

T2 - Built-in to the XPC-MC 68605 chip of the ECI, time is 0.3 seconds and cannot be changed with the software.

T4 - Inactive link timer.

T21 - Call request response timer for SVCs.

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This chapter deals with two major troubles: clearing the denial of the backup memory transfers and clearing the conditional (with errors) completion of the main controller reset or the utility boot command.

The following items, on the maintenance considerations, are presented here as trouble-clearing tips:

- Problems may occur that suggest the PMEM card is defective or the PMEM card has corrupted executables or data base information on it. The following procedures outline the steps that should be followed to diagnose the problem and the appropriate actions to be taken, based on the results of the diagnostics.
- Before MC or EFC plug-ins are replaced, the MC must be removed from service.
- Some problems will cause the MC or EFC to go to the MCOND (maintenance condition) autonomously. While in the MCOND, the MC will be in the required state to process main controller maintenance commands. Commands directed to the peripheral units will be denied. After the trouble is cleared (or the particular backup transfer is completed), the restore MC command or hard reset is used to exit the MCOND.

Clear BMTR DNY Trouble

Supplemental Information - Replace PMEM Card

The procedure to diagnose and replace the PMEM card is as follows:

1. Perform the following diagnostic tests on both the PMEM and SMEM cards:
 - a. Do the card diagnostic test, craft code X'0004.
 - b. Do the validate data base test, craft code X'0010.
 - c. Validate the boot block, craft code X'0020.
 - d. Validate executable header, craft code X'0040.
 - e. Validate executables, craft code X'0080.

Several possible cases can result from this set of tests that lead to different actions to resolve the problems:

- a. If the PMEM card fails card diagnostics and the SMEM card passes all tests, then go to Step 2.
 - b. If the PMEM card succeeds on the card diagnostic test, but fails any of the other tests, while the SMEM card succeeds on all tests, then go to Step 3.
 - c. If the PMEM and SMEM card both succeed on the card diagnostic tests, but both fail on one of the other diagnostic tests, then go to Step 4.
 - d. If the SMEM card fails card diagnostics and the PMEM card passes all tests, then go to Step 5.
 - e. If the SMEM card passes card diagnostics, but fails any of the other tests, while the PMEM card succeeds on all tests, then go to Step 6.
2. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to be defective):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : : MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service..

- c. Replace the PMEM card with the card currently in the SMEM slot.
- d. Insert a spare memory card into the SMEM slot.
- e. Physically insert the CPU2 pack into the frame.
- f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
- g. The System should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, discard the bad PMEM card and continue with Step 7.

If PMEM fails to boot, run diagnostics on the PMEM card. The card diagnostic tests (craft code X'0004) will most likely fail, because the problem is most likely a PMEM card connector problem and the CPU2 board itself should be replaced. The system should be rebooted with the PMEM and SMEM cards in their original slots but with a new CPU2 pack.

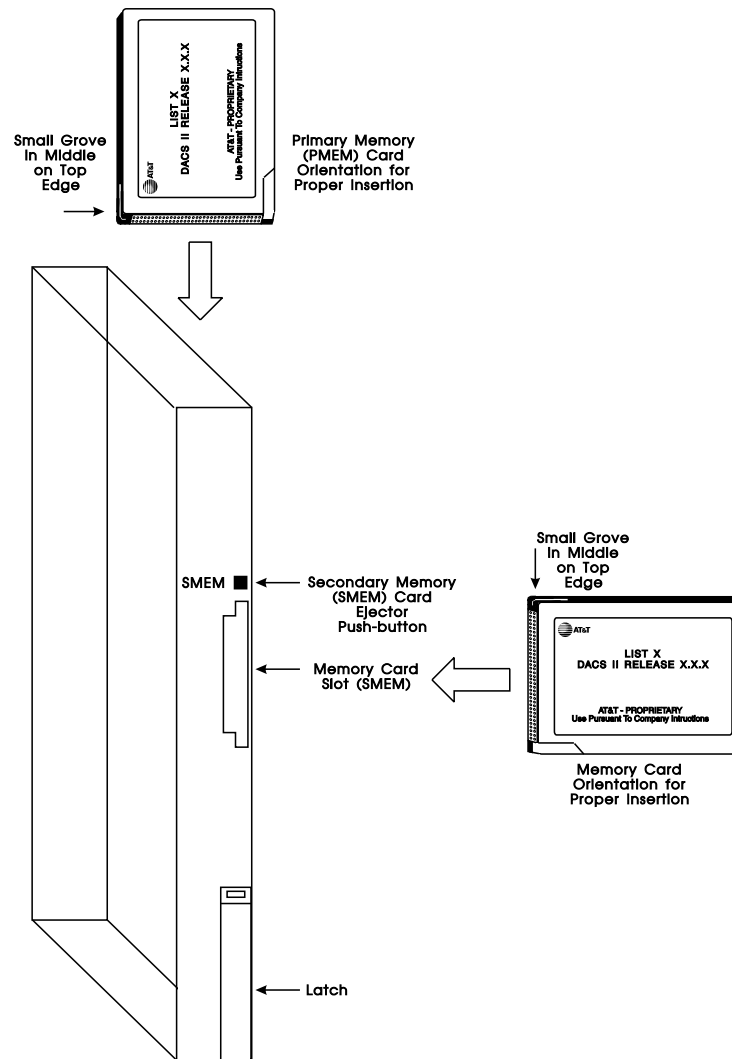


Figure 7-1. Memory Card Locations on CPU2

3. Replace the PMEM card (Figure 8-2) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the card currently in the SMEM slot.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The system should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, continue with Step 7. (The old PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card (Figure 8-2) with the most recently archived memory card by doing the following (PMEM and SMEM cards are suspected to contain corrupted executables or database):
 - a. Place the frame into MCOND before physically removing the the CPU2 pack by entering the following command:
RST : :MC, MCOND !
The frame will deny this command if it is already in MCOND.
 - b. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack while the MC is out-of-service.
 - c. Replace the PMEM card with the most recently archived memory card.
 - d. Insert a spare memory card into the SMEM slot.
 - e. Physically insert the CPU2 pack into the frame.
 - f. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - g. The System should be brought into service with the correct version of the executables and a valid but most likely not current database. If the boot completes successfully, continue with Step 7. (The PMEM card and the SMEM card may be recycled as future SMEM cards.)

5. Replace the SMEM card (Figure 8-3) with a spare memory card or with an older archive card that may be recycled. (SMEM card is suspected to be defective.):
 - a. Remove the SMEM card physically from the CPU2 card. (Since the card has been found to be defective by the system, it must already be logically removed from the system.)
 - b. Insert the spare memory card physically into the SMEM slot.
 - c. Discard the bad SMEM card and continue with Step 7.
6. The SMEM card is good but has bad information on it.
Restore the SMEM card:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a "mirrored image" of the other.

RST : : SMEM, BKGRND !

If the command is denied because of bad or mismatching information on the SMEM card with the message:

Warning: The SMEM Card being restored has the following problems!
<message describing the problem>
If YOU STILL WISH TO PROCEED, USE FRC OPTION

Then use the command with the **FRC** option:

RST : : SMEM, FRC, BKGRND !

You will get a response:

ARE YOU SURE? (YES/NO)

Answer YES and the restore operation should complete. Then go to Step 8.

7. To restore the SMEM card, enter the following command:

**NOTE:**

The PMEM contents are copied onto the SMEM card when SMEM is restored. Each card is then a "mirrored image" of the other.

RST : : SMEM, BKGRND !

8. If there is now a replacement card in the PMEM slot, then the PMEM may not contain the latest db changes, depending on which replacement card was used. Any changes not present need to be re-done.
9. Create a new archive copy if needed (archived copy was used to replace the PMEM). Refer to the "Database Archive Procedure" (Volume 1).

Trouble Clearing Procedure

1. To transfer the database or executables between the memory cards via the BMTR command, the frame must be in maintenance condition (MCOND); PMEM and SMEM must be in-service. When transferring information from SMEM to PMEM, the user must have restricted maintenance (RMON) privileges. For **BMTR** from RAM to MEM the frame must be in-service.

If necessary—

Enter **RST::MC,MCOND!** to go to MCOND and log on as user DAX or user with RMON enabled.

2. Reenter the BMTR command that was denied.
3. If BMTR ...DNY message is received again, proceed to Step 4.
 - If denial message is not received, then take no further action; trouble or DACS II condition that prevented first transfer attempt is not present at this time. If the MC is in MCOND, enter RST::MC to exit maintenance condition.
4. Locate the denial condition (COND) code in the message and refer to Table 7-1 for the meaning of the code.



NOTE:

Anytime the BMTR command is reentered and a different denial is received in the procedure, return here to clear the new denial.

5. Which denial code appears in the BMTR output message?
 - If **COND 8B**, continue with Step 6.
 - If **COND 8C** or **96**, proceed to Step 8.
 - If **COND 85, 86, or 8D**, proceed to Step 14.
 - If **COND 8E, 8F, 90, 95**, proceed to Step 23.
 - If **COND 84, 93, or 94**, proceed to Step 28.
 - If **COND 97**, proceed to Step 32.
 - If **COND 20, 21, or 84**, proceed to Step 35.
 - If **COND 99 or A5**, proceed to Step 37.
 - If **COND 92 or E7**, proceed to Step 40.

Table 7-1. Condition Codes (BMTR)

Code	Meaning
20	Software ID block cannot be read
21	Software ID block failed comparison
84	Trouble occurred while accessing SMEM; SMEM set to safe
85	Trouble occurred while accessing PMEM
86	Source does not contain information
8B	Frame not in-service
8C	MP or unit RAM error
8D	PMEM error (data base OP-CL-RD-WR-SK)
8E	Data base cannot send/receive mail
8F	Cannot lock/unlock RAM data base
90	Data base cannot access slave mailbox
92	Can't mount or unmount PMEM
93	SMEM not present
94	SMEM is not restored
95	Invalid option, mailbox, or flag
96	Unit is out-of-service
97	Entity cannot be addressed in configuration
98	Checksum verification failed
99	SMEM has old generic journal files
A5	SMEM software features do not match PMEM
E7	PMEM not restored

6. Enter the following:

RST : :MC!

7. Reenter the **BMTR** command.

- If the command completes successfully, this procedure is completed.
- If the same denial is received, contact technical consultant.

For COND 8C or 96, Continue:

8. Attempt to locate failed pack or out-of-service unit using the following commands:

DGN : :MP !

DGN : :UNIT [q]q, UC ! (where [q]q = unit number 1 through 16)

- If commands are denied because MC is out-of-service, enter **RST : :MC !**.

9. Enter **UTL : :QRY, ALL !** and check for failed and out-of-service MC packs and UCs.

⇒ NOTE:

The conditions are indicated by the presence of a "1" in the out-of-service, failed, and pested columns for each pack. Unequipped NPCs are indicated by dashes.

10. If you are clearing COND 96 and have units out-of-service, enter command(s) to restore service as follows: **RST : :UNIT [q]q, UC !**.
11. If you received DGN ...STF message for MP or UNIT UC, refer to *Manual Diagnostic Failures* to clear the particular failed diagnostic.
12. If the MC is in-service, enter **UTL : :BOOT, FRAME !**. If the MC is out-of-service, operate the reset on the status panel as follows: hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.

⇒ NOTE:

The boot updates all the frame memories from the PMEM; this operation can take as long as 15 minutes to complete.

13. If reset was just performed and the copy is between PMEM and SMEM—Enter the following commands:

RST : :MC, MCOND !

RST : :SMEM !

- Reenter the BMTR command.
- If the same denial is received, contact technical consultant.

For COND 85, 86, or 8D, Continue:

14. Enter **RST : :PMEM!** to ensure the PMEM is restored.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials* (Supplemental Information - Replace PMEM Card).
15. Reenter the BMTR command that was originally denied.
 - If COND 85 or 8D is received again, proceed to "Supplemental Information - Replace PMEM Card."
 - If COND 86 is received again, proceed to "Supplemental Information - Replace PMEM Card."
 - If the BMTR command completes successfully—
Enter **RST : :MC!** to exit the maintenance condition. This procedure is completed.
16. If SMEM is the source for the BMTR command and "COND 86" is received—
Place the ESD grounding strap on your wrist and replace the SMEM card with the most recent archived copy.
17. Renter the BMTR command that was originally denied.
 - If problem persists contact technical consultant.
 - If BMTR command completes, proceed with next step.
18. Enter the following command:

RMV::SMEM
19. Place the ESD grounding strap on your wrist and physically remove the archived card from the SMEM slot.
20. Insert spare card into the SMEM slot.
21. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
22. Any DB changes that were not present on the archived memory card, must be redone.

For COND 8E, 8F, 90, or 95, Continue:

23. Check printout for ERR SOFTWARE messages that name the SMEM or PMEM.
24. Enter **DGN : :MC!**.
25. If you have any failed diagnostics, go to *Manual Diagnostic Failures* to clear the particular failed diagnostic.
26. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND) is received, continue with next step.
 - If RESET ...COMPL (with COND) is received, go to Section 7.2.
27. Reenter the BMTR command that was denied.
 - If the command is completed, this procedure is completed. If the MC is in MCOND, enter **RST : :MC!** to exit the maintenance condition.
 - If the same denial is received, contact technical consultant.

For COND 84, 93, or 94, Continue

28. Perform the following to ensure that the SMEM is installed and powered up:
 - Verify that the SMEM is installed.
 - Enter **RST : :SMEM!** to power up SMEM and place it in-service.
29. Reenter the original BMTR command that was denied.
 - If the command is denied again, continue with the next step:
 - If BMTR ...DNY message is not received when original BMTR command is reentered, this procedure is completed.
Enter **RST : :MC** to restore equipment.
30. The craft person should run the following diagnostic tests on the SMEM card:
 - a. Do the card diagnostic test, craft code X'0004.
 - b. Do the validate data base test, craft code X'0010.
 - c. Validate the boot block, craft code X'0020.
 - d. Validate executable header, craft code X'0040.
 - e. Validate executables, craft code X'0080.
 - a. If the SMEM card fails card diagnostics, place the ESD grounding strap on your wrist and replace the the SMEM card and discard the original SMEM card.
 - b. If the SMEM card succeeds on the card diagnostics tests, but failed any other test, place the ESD grounding strap on your wrist and replace the SMEM card (this card can be recycled for future use).
31. Reenter the BMTR command that was denied.
 - If the command is completed, this procedure is completed. Enter **RST : :MC!** to exit the maintenance condition.
 - If the same denial is received, contact technical consultant.

For COND 97, Continue

32. The configuration information on the SMEM does not match the frame configuration. Enter **UTL : : QRY, CNFGR!** and check the software serial number in the configuration file. This is the number in the SS column of the output message.

**NOTE:**

The software serial number in the configuration information designates the data bases on SMEM for use in a particular frame. A SMEM from storage may have the default (arbitrary) serial number.

33. If the correct SMEM is not installed, place the ESD grounding strap on your wrist and install it.
34. Reenter the BMTR command that was denied.
 - If the command is completed, this procedure is completed. Enter **RST : : MC!** to exit the maintenance condition.
 - If the same denial is received, contact technical consultant.

For COND 20 or 21, Continue:

35. If the correct SMEM is not installed, place the ESD grounding strap on your wrist and install it.
36. Reenter the BMTR command that was denied.
 - If the same denial is received, contact technical consultant.
 - If the denial message is not received, this procedure is completed.

For COND 99 or A5, Continue:

37. The wrong memory card is installed in the SMEM slot. The COND 99 indicates that it is an old memory card that contains previous software information, and COND A5 indicates that the SMEM card contains a different feature package.
38. Place the ESD grounding strap on your wrist and install the correct SMEM card.
39. Reenter the BMTR command that was denied.
 - If the command is completed, enter **RST : :MC!** to exit the maintenance condition, this procedure is completed.
 - If the same denial is received, contact technical consultant.

For COND 92 or E7, Continue:

40. Enter command to restore PMEM to service, **RST : :PMEM!**.
 - If RST ...DNY message is received, find the meanings of the condition codes in *Command Denials*.
41. Reenter BMTR command that was denied.
 - If the same denial is received, contact technical consultant.
 - If the denial message is not received, enter **RST : :MC!** to exit the maintenance condition, this procedure is completed.

Clear Reset, Boot, RST MC Conditional Completion

Overview: This procedure is used to respond to a conditional (with errors) completion of a frame reset, the BOOT FRAME command (boot), or the RST MC command. Frequently, the conditional completion will put the MC in MCOND for entry of maintenance commands only; full command capability is returned when the trouble is cleared and the RST MC completes. During a reset, the controller packs (CI and MP) and the frame unit UCs are initialized, internal communications are established, the PMEM and SMEM cards are powered up, and programs are transferred from the PMEM or SMEM to respective packs. The RST MC command performs the same operations as the reset except that the main controller plug-ins are not initialized.

PMEM Card Replacement Procedure

The procedure to replace a memory card is as follows:

1. Perform the following diagnostic tests on both the PMEM and SMEM cards:
 - a. Do the card diagnostic test, craft code X'0004.
 - b. Do the validate data base test, craft code X'0010.
 - c. Validate the boot block, craft code X'0020.
 - d. Validate executable header, craft code X'0040.
 - e. Validate executables, craft code X'0080.

Several possible cases can result from this set of tests that lead to different actions to resolve the problems:

- a. If the PMEM card fails card diagnostics and the SMEM card passes all tests, then go to Step 2.
 - b. If the PMEM card succeeds on the card diagnostic test, but fails any of the other tests, while the SMEM card succeeds on all tests, then go to Step 3.
 - c. If the PMEM and SMEM card both succeed on the card diagnostic tests, but both fail on one of the other diagnostic tests, then go to step 4.
2. Replace the PMEM card (Figure 7-3) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to be defective):
 - a. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.
 - b. Replace the PMEM card with the card currently in the SMEM slot.
 - c. Insert a spare memory card into the SMEM slot.
 - d. Physically insert the CPU2 pack into the frame.
 - e. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - f. The System should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, discard the bad PMEM card and continue with Step 5.

If the boot fails, run diagnostics on the PMEM card. The card diagnostic tests (craft code X'0004) will most likely fail, because the problem is most likely a PMEM card connector problem and the CPU2 board itself should be replaced. The system should be rebooted with the PMEM and SMEM cards in their original slots but

with a new CPU2 pack.

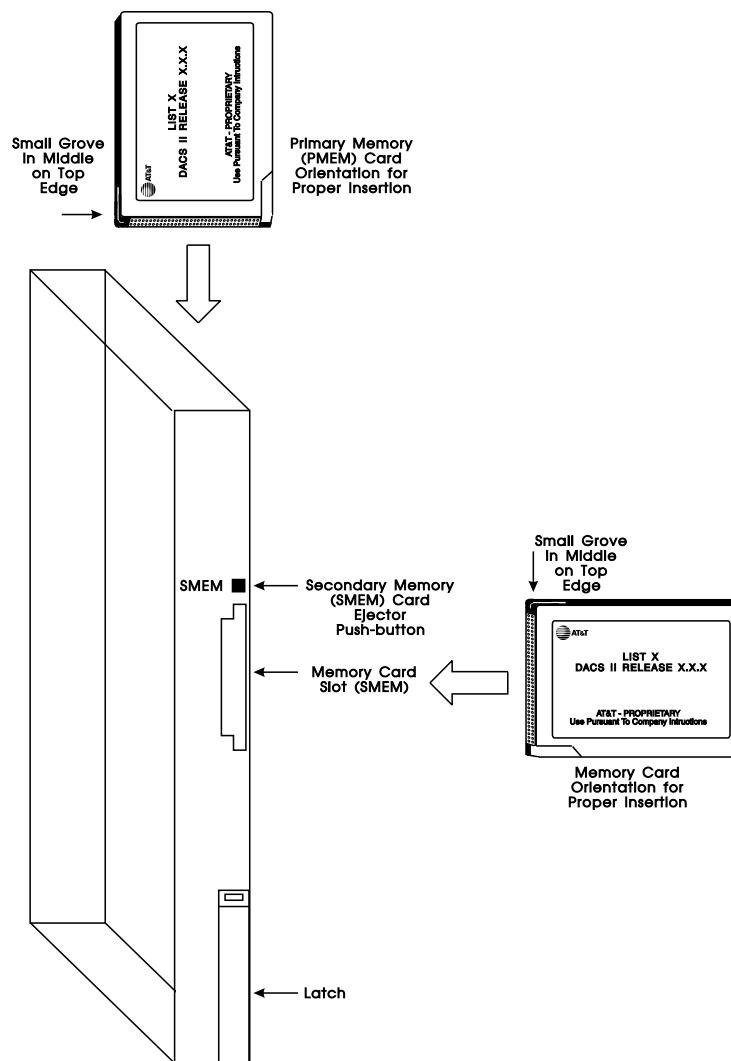


Figure 7-2. Memory Card Locations on CPU2

3. Replace the PMEM card (Figure 7-3) with the card currently in the SMEM slot by doing the following (PMEM card is suspected to contain corrupted executables or database):
 - a. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.
 - b. Replace the PMEM card with the card currently in the SMEM slot.
 - c. Insert a spare memory card into the SMEM slot.
 - d. Physically insert the CPU2 pack into the frame.
 - e. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - f. The system should be brought into service with the correct version of the executables and database. If the boot completes successfully and the database is correct, continue with step 5. (The PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card (Figure 7-3) with the most recently archived memory card by doing the following (PMEM and SMEM cards are suspected to contain corrupted executables or database):
 - a. Place the ESD grounding strap on your wrist and physically remove the CPU2 circuit pack.
 - b. Replace the PMEM card with the most recently archived memory card.
 - c. Insert a spare memory card into the SMEM slot.
 - d. Physically insert the CPU2 pack into the frame.
 - e. On the Status Panel, hold the RESET ENABLE switch to ON and momentarily press the RESET button.
 - f. The System should be brought into service with the correct version of the executables and a valid but most likely not current database. If the boot completes successfully, continue with Step 5. (The PMEM card and the SMEM card may be recycled as future SMEM cards.)

5. To restore the SMEM card—
Enter the following command:

**NOTE:**

The PMEM contents are copied onto the SMEM card when the SMEM is restored. Each card is then a “mirrored image” of the other.

RST : : SMEM, BKGRND

6. The replacement card now in the PMEM slot, may not contain the latest db changes, depending on which replacement card was used. Any changes not present need to be re-done.
7. Create a new archive copy if needed (archived copy was used to replace the PMEM),
Refer to the "Database Archive Procedure" (Volume 1).

Trouble Clearing Procedure

1. Locate the COND code in the RESET, BOOT FRAME, or RST MC message.

**NOTE:**

The message shows one trouble at a time (the first one found). If other troubles exist, a different condition code will occur after the reset or restore is repeated. **If a different code occurs, go to Step 2 to clear that code.**

2. Which condition code is given in the RESET, RST MC, or BOOT message?
 - If **COND 46 (configuration file)**, contact technical consultant. This condition code can be caused by the interaction of trouble-clearing operations with the existing trouble conditions; the technical consultant will need to reconstruct the sequence that led to the trouble.
 - If **COND 47 (data base)**, proceed to Step 4.
 - If **COND 48 (journal)**, continue with Step 3.
 - If **COND 49 (unit)**, proceed to Step 9.
 - If **COND 4B (RST MC, SMEM source)**, proceed to Step 11.
 - If **COND 4C (fail to boot CI)**, proceed to Step 13.

For COND 48, Continue

3. If conditional completion was received as part of doing CFR FRAME or using the DLT FPKG command, there is a discrepancy between the journal files in the working RAM and the PMEM.

- Enter **RST::MC,NOJRN!** to clear the problem.

If command completed successfully the procedure is complete.

Otherwise continue with next step.

⇒ NOTE:

A database problem on PMEM is suspected.

For COND 47, Continue

4. **Comment:** This step and the next step are an attempt to restore the PMEM database from the SMEM database that currently resides in the frame.
 - a. If the MC is not in MCOND—
Enter the following:

RST::MC,MCOND
 - b. If SMEM and/or PMEM is not in service—
Enter the following command(s):

RST::PMEM
RST::SMEM
 - c. Logon as user DAX or user with RMON enabled—
 - d. Enter **UTL::BMTR, FROM SMEM, TO PMEM!** to copy the data base information onto the PMEM.
 - If BMTR ...DNY message is received from the transfer, go to Section 7.1.
5. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND) message is received, this procedure is completed.
 - If RESET ...COMPL (with same COND) message is received, continue with the next step.

Comment: The SMEM card also contains the suspected database problem.
 - If the RESET completed with different error message return to Step 2.

6. Obtain the archived flash card (containing the database)—
Place the ESD grounding strap on your wrist and install it in the SMEM slot.
7. **Comment:** This step and the next step are an attempt to restore the PMEM database from the archived SMEM database.
 - a. If the MC is not in MCOND—
Enter the following:

RST::MC,MCOND
 - b. If SMEM and/or PMEM is not in service—
Enter the following command(s):

RST::PMEM
RST::SMEM
 - c. Logon as user DAX or user with RMON enabled—
 - d. Enter **UTL::BMTR, FROM SMEM, TO PMEM!** to copy the data base information onto the PMEM.
 - If BMTR ...DNY message is received, go to Section 7.1.
 - If BMTR command completes successfully—
Place the ESD grounding strap on your wrist and replace the "archive" SMEM card with a spare SMEM card. (Return the archive flash card to it's storage location.)
8. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND) message is received, this procedure is completed.

 **NOTE:**
Any DB changes that were not present on the archived memory card, must be redone.
 - If the RESET completed with different error message return to Step 2.
 - If RESET ...COMPL (with same COND) message is received, contact technical consultant.

For COND 49, Continue

9. Enter **UTL::QRY, ALL!** to find the unit UC which is out-of-service. The subject unit may have been removed by error recovery.

10. Enter **RST::UNIT [q]q,UC!** to restore the same unit.
 - If DGN ...STF message is received, go to Section 5.9 to clear failed unit UC diagnostic.
 - If the command is completed, this procedure is completed.

For COND 4B, Continue

11. The error condition indicates that the boot from the PMEM failed and that the SMEM was used as the source for the boot.
12. Replace the DACS II PMEM (Refer to "Supplemental Information - Replace PMEM Card").

For COND 4C, Continue

13. Replace the CI, ECI, HECI plug-in whichever is installed in the main controller.
14. On the status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
 - If RESET ...COMPL (with no COND) message is received, this procedure is completed.
 - If RESET ...COMPL (with COND) message is received, contact technical consultant.

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Clear FRADTS FRCMP Message

Overview: This procedure deals with frame comparison type frame audit messages. These messages result when there is a difference in the data contained in the UC or pack memory and the MP memory. The FRADTS test number identifies what data is in question, and the message data bytes give which pack and what values are in the data bases. The boot operation (the entire frame, the unit UC restore, or pack restore) is used to bring the UC or pack memory into agreement with the PMEM. When doing corrective action, remember that booting the frame can take as long as 30 minutes to complete, and removing an NPC causes all of its channels to be taken out of service.

⇒ NOTE:

Although you will want to take notice of all FRADTS messages, you generally do not need to perform corrective action unless the same message recurs. **Provisioning commands that are not followed by a boot can cause FRADTS messages with test numbers in the 220 to 237 range.**

1. Locate the following in the trouble message: the test number which appears after the FRADTS keyword and the data bytes after the test number. These data bytes are referred to as dn through d0 in left-to-right order.

The following lists the frame audits in numerical ascending order along with the table the corrective action appears in:

Frame Audit Table #

002	8-1
003	8-1
004	8-1
005	8-1
006	8-1
007	8-1
008	8-1
011	8-1
012	8-1
013	8-1
014	8-1
015	8-1
016	8-1
017	8-1
018	8-1
019	8-2
01A	8-2
01B	8-2
01C	8-2
01D	8-2
021	8-1
022	8-1
023	8-1
024	8-1
025	8-1
026	8-1
027	8-1
028	8-1
029	8-1
102	8-1
103	8-1
104	8-1
105	8-1
106	8-1
112	8-1
113	8-1
114	8-1
115	8-1
116	8-1
121	8-1
122	8-1
123	8-1
125	8-1
126	8-1
127	8-1
128	8-1

Frame Audit Table #

131	8-1
132	8-1
133	8-1
135	8-1
136	8-1
150	8-1
151	8-1
152	8-1
154	8-1
155	8-1
156	8-1
157	8-1
160	8-1
161	8-1
162	8-1
163	8-1
164	8-1
165	8-1
166	8-1
167	8-1
168	8-1
171	8-2
172	8-2
173	8-2
174	8-2
205	8-1
207	8-1
208	8-1
209	8-1
210	8-1
211	8-1
215	8-1
216	8-1
217	8-1
218	8-1
220	8-2
221	8-2
222	8-2
223	8-2
224	8-2
225	8-2
226	8-2
227	8-2
228	8-2
229	8-2
230	8-2

Frame Audit	Table #
231	8-2
232	8-2
233	8-2
234	8-2
235	8-2
236	8-2
237	8-2
238	8-2
239	8-2
270	8-3
271	8-3
272	8-3
273	8-3
274	8-3
275	8-3
276	8-3
277	8-3
278	8-3
279	8-3
27A	8-3
27B	8-3
27C	8-3
27D	8-3
27E	8-3
27F	8-3
280	8-3
281	8-3
282	8-3
283	8-3
284	8-3
285	8-3
286	8-3
287	8-3
288	8-3
289	8-3
28A	8-3
28B	8-3
28C	8-3
28D	8-3
28E	8-3
28F	8-3
290	8-3
291	8-3
292	8-3
293	8-3
294	8-3

Frame Audit Table #

295	8-3
296	8-3
297	8-3
298	8-3
299	8-3
29A	8-3
29B	8-3
29C	8-3
29D	8-3
29E	8-3
29F	8-3
2A0	8-3
2A1	8-3
2A2	8-3
2A3	8-3
2A4	8-3
2A5	8-3
2A6	8-3
2A7	8-3
2A8	8-3
2A9	8-3
2AA	8-3
2AB	8-3
301	8-1
302	8-1
303	8-1
305	8-1
306	8-1
307	8-1
308	8-1
310	8-1
311	8-1
312	8-1
313	8-1
314	8-1
315	8-1
316	8-1
317	8-1

2. Refer to Table 8-1, 8-2, 8-3 to perform corrective action and consider the following:
 - If a facility NPC must be removed from service, all channels on that NPC will be out-of-service until the NPC is restored to service (restore operation completes).
 - For a FRADTS on an NPC or facility, the NPC number is determined by converting the HEX pack value to decimal. See Figure 8-1 for an example and Table 8-4 for hexadecimal numbers from 1 to 160. To get the NPC number in other units, add 160 for each preceding unit.
3. If the FRADTS recurs and the unit controller has not already been removed and restored, enter **RMV: :UNIT [q]q,UC!** and **RST: :UNIT [q]q,UC!**.
4. If the FRADTS message recurs and the frame has not already been booted, enter **UTL: :BOOT,FRAME!**.
5. If any FRADTS number recurs, contact technical consultant for assistance.

**WARNING:**

When performing the prescribed corrective actions, remember that removing an NPC from service causes all of its channels to be taken out of service. This action should only be performed during non-peak traffic hours.

Table 8-1. Equipage/Provisioning

ttt =	Pack	Data Bytes*	Corrective Action
002 003 007 032	FTMI FC UNIT DSPI	d5=unit No. d4=pack No. (NPCs - HEX No.)†	Enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC!
008	ECCN/ CCN	d4=ECCN side (0,1)	Enter RMV::CCI s! and RST::CCI s!
011	NPC	d5=unit No. d4=NPC No. (HEX No.)†	Enter RMV::NPC <npc No.>! and RST::NPC <npc No.>!
021 022 023 024	CCN CCNI CCB TSI	d5=side (00 or 01) d4=pack No. TSI=d5,d4,d3	(1) Remove and restore any pack on subject side (2) Enter UTL::BOOT, FRAME!
025	CCN	d5=side (00 or 1)	Enter UTL::BOOT, FRAME!
205 207 208 209	FTMI FC NPC NPC	d5=unit No. d4=pack No. (01-04) (NPCs=HEX No.)†	(1) Enter RMV and RST commands for subject pack (2) Look for DGN-STF (3) If recurs, enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC!
210	FC	d3=side, d4=FTMI d5=unit No.	Enter RMV::UNIT [q]q,FC sf! and RST::UNIT [q]q,FC sf!
301	CCN Group	d5=side	Remove and restore any pack on side. If side is active, go to other side first (CFR::XC a!)
302 303	TSI CCB	TSI=d5,d4,d3 d5=side, d4=CCB No.	Enter commands to RMV and RST subject pack
308	LINK	d5=link No. (01-06)	Enter commands to remove and restore link

* The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0.

† To obtain NPC number, convert HEX digits to decimal.

Continued on next page

Table 8-1. Continued

ttt =	Data Bytes*	Corrective Action
004,005,006	d5=Unit No. d4=FTMI No. (01-04)	(1) Enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC! (2) If recurs, enter UTL::BOOT,FRAME!
012,013,014, 015,016,017 018	d5=Unit No. d4=NPC No. (HEX 01-A0)†	(1) Enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC! (2) Enter RMV::NPC <npc No.>! and RST::NPC <npc No.>!
026-029	d5=ECCN side (0,1)	Enter RMV::ETSI sqq! and RST::ETSI sqq!
211,215, 216,217, 218	d5=Unit No. d4=NPC No.	(1) Enter RMV::NPC <npc No.>! and RST::NPC <npc No.>! (2) If recurs, remove 2 NPCs, reseat pack, and restore
102,103,104, 105,106,112, 113,114,115, 116,125,126, 127,128,135, 136,154,155 156,157		Enter UTL::BOOT,FRAME!
121,122,123, 131,132,133, 150,151,152, 160,161,162, 163,164,165, 166,167,168	d5=Unit No. d4=NPC No.	Enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC!
305,306,307, 310,311,312, 313,314,315	d5=SYNC side (0,1) d4=TLI No. (01-04) (except for ttt=305, 312, 313, 314)	(1) If TLI is named, remove and restore SYNC TLI (2) Enter ULT::QRY,STATE,SYNC! and look for SOURCE TLI,MATE (3) Enter RMV::SYNC a! and RST::SYNC a! (byte d5=sync side)
316,317	d5=ECCN side (0,1)	Enter RMV::CCI s! and RST::CCI s!

* The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0.

† To obtain NPC number, convert HEX digits to decimal.

Table 8-2. Facility Error Thresholds

ttt =	Data Bytes*	Corrective Action
171,172,173 174	d5=Unit No. d4=NPC No.	Enter RMV::NPC <npc No.>! and RST::NPC <npc No.>!
019,01A,01B 01C,01D	d5=Unit No. d4=NPC No.†	Enter RMV::UNIT [q]q,UC! and RST::UNIT [q]q,UC!
220,221,222,223,224, 225,226,227,228,229, 230,231,232,233,234, 235,236,237,238,239,	d5=Unit No. d4=NPC No.†	Enter RMV::NPC <npc No.>! and RST::NPC <npc No.>!

* The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0.

† To obtain NPC number, convert HEX digits to decimal.

Table 8-3. Performance Monitoring

ttt=	Data Bytes*	Corrective Action
270,271,272,273, 274,275,276,277, 278,279,27A,27B, 27C,27D,27E,27F, 280,281,282,283, 284,285,286,287, 288,289,28A,28B, 28C,28D,28E,28F,	d0 Long ANSI threshold in hardware d1 Long ANSI threshold in hardware d2 Long ANSI threshold in hardware d3 Long ANSI threshold in hardware d4 Long ANSI threshold in database d5 Long ANSI threshold in database d6 Long ANSI threshold in database d7 Long ANSI threshold in database d8 NPC number d9 UNIT number	(1) Verify the threshold value in the database is correct. (2) Enter UTL : : BOOT, FRAME
290,291,292,293, 294,295,296,297, 298,299,29A,29B, 29C,29D,29E,29F, 2A0,2A1,2A2,2A3, 2A4,2A5,2A6,2A7, 2A8,2A9,2AA,2AB	d0 Long 30-channel threshold value d1 Long 30-channel threshold value d2 Long 30-channel threshold value d3 Long 30-channel threshold value d4 Long 30-channel threshold value d5 Long 30-channel threshold value d6 Long 30-channel threshold value d7 Long 30-channel threshold value d8 NPC number d9 UNIT number	(1) Verify the threshold value in the database is correct. (2) Enter UTL : : BOOT, FRAME

Powers of 16 = $16^3 16^2 16^1 16^0$
Example: Hex = 005A
Decimal Number = (0×16^3)
 $+ (0 \times 16^2)$
 $+ (5 \times 16^1)$
 $+ (A \times 16^0)$, where $16^0 = 1$
0s = $(0 \times 0) = 0$
5 = $(5 \times 16) = 80$
A = $(A \times 1) = 10$, where A = 10
Decimal Number = 90
(NPC Number = $90 + 1$ because internal count started with 0)
Hex Characters: = A = 10, B = 11, C = 12, D = 13, E = 14, F = 15

Figure 8-1. Hexadecimal-to-Decimal Conversion Example

Table 8-4. Hexadecimal Numbers

(1) 01	(21) 15	(41) 29	(61) 3D	(81) 51	(101) 65	(121) 79	(141) 8D
02	16	2A	3E	52	66	7A	8E
03	17	2B	3F	53	67	7B	8F
04	18	2C	40	54	68	7C	90
05	19	2D	41	55	69	7D	91
06	1A	2E	42	56	6A	7E	92
07	1B	2F	43	57	6B	7F	93
08	1C	30	44	58	6C	80	94
09	1D	31	45	59	6D	81	95
(10) 0A	(30) 1E	(50) 32	(70) 46	(90) 5A	(110) 6E	(130) 82	(150) 96
0B	1F	33	47	5B	6F	83	97
0C	20	34	48	5C	70	84	98
0D	21	35	49	5D	71	85	99
0E	22	36	4A	5E	72	86	9A
0F	23	37	4B	5F	73	87	9B
10	24	38	4C	60	74	88	9C
11	25	39	4D	61	75	89	9D
12	26	3A	4E	62	76	8A	9E
13	27	3B	4F	63	77	8B	9F
(20) 14	(40) 28	(60) 3C	(80) 50	(100) 64	(120) 78	(140) 8C	(160) A0

Clear FRADTS DGN Trouble

1. Check FRADTS message for MC keyword (FRADTS MC DGN).
 - If MC keyword is in the message, continue with Step 2.
 - If not, from Table 8-5 determine which circuit failed the FRADTS diagnostic using the circuit abbreviation and data in the output message.
2. Enter the diagnostic command from Table 8-6 for the circuit named in the FRADTS message. The abbreviations for the circuits in the table match the message keywords.
3. If DGN ...STF message is received, refer to the procedure in *Manual Diagnostic Failures* to clear the trouble.
 - If the message is not received, there is no hardware trouble at this time; the autonomous diagnostic may have resulted from an error situation that cleared up.

Table 8-5. Circuit Pack Identification

Circuit	3-Digit Field (eee)	Data Byte (d0)
ETSI	eee = side (000.001)	d0 = left,right=from,to
SYN (SYNC)	= side	= 00
UFC (FC)	= unit (001-016)	= 00
FTM (FTMI)	= unit	= FTMI No. (01-04)
ECCN (CCI)	= CCI (000/001)	= 00
NPC	= NPC (001-640)	= 00
LNK (LINK)	= link (001-006)	= 00
TLI	= sync side (00/001)	= TLI No. (01-04)
CRO	= sync side	= TLI No. (03)
UNI (UNIT)	= unit (001-016)	= 00
DSP (DSP1)	= DSPU	= not used
FMT 0qs	= unit (q) and side (s)	= not used
CCB	= side	= CCB No. (01-06)
CCN(CCNI)	= CCNI (000/001)	= 00
FLI 0qk	= unit (q) and side (k)	= not used
MXR 0qc	= unit (q) and MXR (c)	= not used
MIU 0qc	= unit (q) and MIU (c)	= not used

Table 8-6. Diagnostic Commands

Circuit (Abbrev.)	Command
BX	DGN::MC!
MTC (MT)	DGN::MC!
CI	DGN::CI!
PMEM	DGN::PMEM!
SYNC	DGN::SYNC a!
CRO	DGN::SYNC,TLI 3,CRO!
TLI	DGN::SYNC a,TLI n!
UC	DGN::UNIT [q]q,UC!
FTMI	DGN::UNIT [q]q,FTMI d!
DSPI	DGN::UNIT [q]q,DSPI!
FC	DGN::UNIT [q]q,FC sb!
CCI	DGN::CCI s!
ETSI	DGN::ETSI sqq!
CCNI	DGN::CCNI s!
CCB	DGNCCB!
TSI	DGN::TSI sft!
NPC	DGN::NPC <npc No.>[-<range>],[SIDE s],[INCL]!
SMEM	DGN::SMEM!
LINK	DGN::LINK j!
FMT	DGN::UNIT [q]q,FMT s!
FLI	DGN::UNIT [q]q,FLI {S P}!
MXR	DGN::UNIT [q]q,MXR c!
MIU	DGN::UNIT [q]q,MIU c!

Clear FRADTS BMCMP Trouble

Overview: LOOK AT STEPS 1 AND 2 BEFORE READING THIS OVERVIEW.

This procedure deals with the BMCMP type of frame audit which results because there is a difference between the MP memory data base and the PMEM data base. If the message data bytes show that the RAM is not corrupted, the discrepancy will be cleared with the next automatic transfer from RAM to PMEM. However, if the RAM data is invalid, either an immediate BOOT is needed or, if an automatic transfer has already placed the data onto the PMEM, the corrupted PMEM trouble will have to be cleared.

1. Look at the value of data bytes d5 through d1 which are the five bytes just ahead of the COMPL in the FRADTS message.
2. If these bytes equal FF, immediately enter **UTL : :BOOT, FRAME!**.

⇒ NOTE:

The FF bytes indicate that the RAM data is invalid. Entering the BOOT will update the RAM data base from the PMEM and will resolve the problem provided the automatic transfer from RAM to PMEM has not already occurred. This automatic transfer occurs approximately every 15 minutes, and if it occurred, the PMEM has been corrupted which will result in another trouble message and error recovery (ERR message).

- If these bytes do not equal FF, the discrepancy may be temporary until the next automatic transfer (unless it can be done manually by a command). If the message recurs, there may be a problem; contact technical consultant for assistance.



Software Error

9

Contents

Clear ERR SOFTWARE Message

9-1

Clear ERR SOFTWARE Message

Overview: This procedure checks the results of the software error recovery action and gives the meanings of the error types. Unless the message indicates that it is only a REPORT, the recovery action will occur autonomously and will correct the problem via a command abort, a boot, a processor removal, the MC going to MCOND, or the processor being "parked" in the inoperative state. The only manual operations required are to: respond to MP, CI, or UC removals/parking, reset/boot failures, and reenter commands that were aborted. If error recurs, the DACS II may escalate the recovery operation. For example, if entry of a command reveals the error and brings a boot, the next occurrence may bring a circuit removal.

1. In the message lines of the ERR SOFTWARE message, note the ACTION that was autonomously initiated. The PROC (process) named in the message is the one that found the error. Table 9-1 gives the meaning of the ERROR TYPE that is named in the message.
2. Check the output message to see which autonomous recovery action is reported.
 - If **PARK MC/CI** or **PARK UC**, continue with Step 3.
 - If **CDBOOT**, proceed to Step 4.
 - If **MCOND**, proceed to Step 5.
 - If some **other action**, proceed to Step 6.

3. For PARK MC/CI, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button on the DACS II status panel. For PARK UC, enter **RST: :UNIT [q]q,UC!** for the unit number (1 through 16).
4. If MC RESET COMPL message (with no COND code) or RST UC COMPL message is received, proceed to Step **11**.
 - If MC RESET COMPL message (with COND code) is received, refer to *Data Base Troubles* to clear the trouble.
 - If MC RESET stopped is received, refer to *Controller and Link Troubles* to clear the trouble.
 - If DGN ...STF message is received for restore UC, refer to *Manual Diagnostic Failures* to clear the diagnostic trouble.
 - If other denial message is received for restore UC, find the meanings of the condition codes in *Command Denials*.
5. Enter **DGN: :MC!** or separately diagnose the MP.

**NOTE:**

The MC MCOND message in the printout shows that the MC is in the maintenance condition. Commands that were aborted when the software error was detected must be reentered after the trouble is cleared.

- If DGN ...STF message is received, refer to *Manual Diagnostic Failures* to clear the failed diagnostic.
 - If DGN ...STF message is not received, proceed to Step **12**.
6. Check associated messages in printout to determine whether initial autonomous action was completed or denied. If denied, check if some other action resulted.
 - If MP was removed (RCY REMOVE MP) or parked, continue with Step **7**.
 - If not, proceed to Step **8**.
 7. If MC was removed, enter **RST: :MC!**. If MC was parked, reset frame using the **RESET ENABLE** switch and the **RESET** button on DACS II status panel. Then proceed as follows:
 - If **RST MC COND code**, refer to *Data Base Troubles* to clear the trouble.
 - If **reset startup diagnostic or boot fails**, refer to *Controller and Link Troubles* to clear the trouble.
 - If **other response**, proceed to Step **10**.

8. Check for DGN ...STF messages in the recovery sequence, enter **UTL : : QRY, ALL, COMMON!**, and check the output for failed plug-ins (indicated by 1s in the failed position of the out-of-service, failed, pested groupings for the plug-ins).
9. If the recovery ACTION from the ERR SOFTWARE message is listed below, perform the corrective action:
 - REMOVE - Replace failed plug-in and enter command to restore plug-in to service per Figure 9-1.
 - WMBOOT - If the action was denied, enter **UTL : : BOOT, FRAME!**.
 - HWBOOT - If the action was denied, enter the command to restore the plug-in to service per Figure 9-1.
 - REPORT - Respond to the COND completion or denial of the command that brought the ERR SOFTWARE message.

verb::<CP identification>[,option]!

{RMV::	SYNC a!	a = 0 or 1
/RST::	SYNC a,TLI n[,SSP b]!	n = 1-4; b = sync port (0 or 1)
/DGRTH::	CCI s!	s = side 0 or 1
/DGN::}	CCNI s!	s = side 0 or 1
	ETSI sqq!	qq = unit 1-16
	TSI sft!	f = unit (receiving from) (1-6)
	CCB sft!	t = unit (transmitting to) (1-6)
	ETSI,S,ECCN s,ALL!	For all ETSSs on the side
	TSIS,CCN s,ALL!	For all TSIs on the side
	UNIT [q]q,UC!	[q]q = unit (1-16)
	UNIT [q]q,{FTMI d DSPI}!	d = module interface for units 1-4
	UNIT [q]q,FC sd!	sd = FC side (0,1) and FC No. (1-4)
	NPC <npc No.>[,SIDE s]!	<npc No.> = NPC number
		s = SIDE for DSPU
	LINK j!	j = link 1-6
	UNIT [q]q,MIU c!	c = DS3 group (1-6,P)

NOTE: Removing the NPC is service affecting.

Figure 9-1. Commands to Restore Plug-Ins

10. If the corrective action is completed, proceed to Step **13**.
 - If not, continue with Step **11**.
11. If the ERROR TYPE is listed below, perform the additional corrective action (if not already done autonomously) as follows:
 - CHECKSUM/DBCHECKSUM - Repeated errors on same processor indicate a failure or PMEM corruption.
 - HARDWARE - Look for ERR HARDWARE messages or other pack failure messages.
 - EXCESSIVE INT - If trouble recurs (processor parked), notify technical consultant.
 - RAMTEST - If trouble recurs (processor removed), replace the associated pack (MP, EBX, BX, CI, or UC) and enter command to restore MC or UC processor.
12. If the additional corrective action is completed, continue with Step **13**.
 - If not, refer trouble to technical consultant who will use the raw data bytes to further analyze the trouble.
13. Reenter the command that brought the ERR SOFTWARE message. This command will have either been aborted, denied, or have a conditional completion.

 **NOTE:**
FRADTS messages may also occur because of discrepancies that result if BMTR ...RAM to PMEM preceded a boot.
14. If the command is completed, you have completed this procedure.
 - If the command is not completed, refer trouble to technical consultant who will use the raw data bytes to further analyze the trouble.

Table 9-1. Software Error Explanation

Error Type	Explanation
JOURNAL	Failure to record command on PMEM journal.
DATABASE	Failure of software to access data base.
PMEM	Failure of software to access PMEM.
SMEM	Failure of software to access SMEM.
COMMUNICATIONS	Process-to-process communications failure.
CPUDGN	Failure of CPU diagnostic.
MACHINE	Operating system error.
PROGRAM	Internal program failure or error.
CHECKSUM	Memory failure/corruption.
RECOVERY	Recovery-to-recovery problem.
REMOTE PROGRAM	Program error encountered on other processor local process report.
EXCESSIVE INT	Internal problem was causing repeated error handling; so, MC or UC was parked.
RAMTEST	Processor RAM failed test and was removed.
HARDWARE	Hardware write failed; possible hardware failure.
Action	Explanation
RSCOLDBT	Super cold boot.
REPORT	Report only; no action taken.
HWBOOT	Hardware boot from existing data base.
WMBOOT	Boot of data base from PMEM and boot hardware (warm boot).
CDBOOT	Boot entire processor data base and executables and boot processor hardware.
REMOVE	Remove named processor from service.
MCOND	Place MC in maintenance condition.
PARK	Park named processor in inoperative state.

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Clear TS0 R OLD, NEW Message

Overview: This message reports a change of state of TS0 (time slot 0) bits which have been designated for monitoring by the CHG TS0 command. These spare bits include bits 3, 4, and 5 if those bits have not been designated to send alarms during NPC growth and all the other spare bits in TS0. The normal state of these monitored bits is set by the change command, and the changed state is used to indicate some miscellaneous alarm condition.

1. Compare the NEW field with the OLD field in the message to determine which bit changed state; the NPC number also appears in the message. A dash (-) means the bit is not designated for monitoring.
2. The eight bits are represented as "abcdefgh" in the command and message manuals and are identified in Table 10-1.

Table 10-1. Bit Identification

Variable	Meaning
a and b	International Bit (Si) in Frame and Not Frame Words (Only frames 13 and 15 with CRC enabled)
c	Not Selectable - Remote Alarm Indication
defgh	National Bits (b4 through b8)

3. If there is not a centralized maintenance center that monitors alarms, notify far-end personnel that the bit has changed state and determine which alarm condition is indicated by the change.

Check TS0MBOFL Message

Overview: This buffer overflow message is registered for an NPC when the number of change occurrences for the monitored time slot 0 bits exceeds the capacity of the NPC buffer. Once an overflow occurs, the NPC stops monitoring TS0 bits until the restore TS0M command is entered at the DACS II.

1. To quickly check which TS0 bits are being monitored on the NPC, enter **UTL : : QRY, TS0M, NPC <npc No.> [-<range>] !** The presence of 1s in the output word indicates which bits are monitored; the buffer overflow will also be indicated in the output. Table 10-2 identifies the bit positions in TS0.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Last NPC in a continuous range.

Table 10-2. TS0 Bit Identification

Variable	Meaning
a and b	International Bit (Si) in Frame and Not Frame Words (Only frames 13 and 15 with CRC enabled)
c	Not Selectable - Remote Alarm Indication
defgh	National Bits (b4 through b8)

2. Enter **UTL : : QRY, STATE, NPC <npc No.> !** to check for high error counts for the facility parameters See Table 10-3. For PA type NPCs, refer to Table 10-4.
 - If high facility errors are found, you may need to clear the facility error problem per *Facility Alarms*.
 - If high facility errors were NOT found, either the alarm condition being indicated by the spare TS0 bits exists or the equipment has not been provisioned correctly to do the monitoring.

Table 10-3. Facility Status Keywords

Keyword	Meaning	Output Information
OOS/FAIL/ PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	R = red alarm, Y = yellow alarm, A = AIS, B = BER, E = REER, I = RAIS, L = LMA, M = R16, S = sync fail indication, V = A16, X = EER, 1 = PBA, or 0 = no PBA.
DM	Degraded Minutes	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
SERS	Severe Errored Seconds	Same format as for DM.
ERS	Errored Seconds	Same format as for DM.
US	Unavailable Seconds	Same format as for DM.
SLIP	Timing Slip	Same format as for DM.
CRC	Cyclic Redundancy	Same format as for DM.
FRER	Frame Bit Error	Same format as for DM.
LOFA	Loss of Frame Alignment	Same format as for DM.
MER	Multiframe Alignment Error	Same format as for DM.
COFA	Change of Frame Alignment	Same format as for DM.

Table 10-4. Facility Status Keywords (PA Type NPCs)

Keyword	Meaning	Output Information
OOS/FAIL/ PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	0 = No PBA. 1 = PBA exists for one or more of the following: LOS - loss of signal LOF - loss of frame AIS - alarm indication signal EER - excessive error rate RAI - remote alarm indication LMA - loss of multiframe alignment LCMA - loss of CRC4 multiframe alignment BER - bit error rate A16 - AIS received in time slot 16 RAIS - remote AIS RBER - remote bit error rate RMA - remote multiframe alarm SFI - synchronization failure indication PFWOOF - pseudo frame word out-of-frame FLCMA - far-end LCMA. A 1 under any of the headings listed above indicates that the condition exists.
CRC	Cyclic Redundancy Code	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
FRER	Framing Errors	Same format as for CRC.
OFS	Out-of-Frame Seconds	Same format as for CRC.
ES	Errored Seconds	Same format as for CRC.
SES	Severely Errored Seconds	Same format as for CRC.
CSS	Controlled Slip Seconds	Same format as for CRC.
CV	Coding Violations	Same format as for CRC.
UAS	Unavailable Seconds	Same format as for CRC.
UATC	Unavailable Time Count	Same format as for CRC.
MER	Multiframe Errors	Same format as for CRC.
FEBE	Far-End Block Errors	Same format as for CRC.
FES	Far-End ES	Same format as for CRC.
FSES	Far-End SES	Same format as for CRC.
FUAS	Far-End UAS	Same format as for CRC.

3. If you want to change (or disable) the TS0 monitoring for the NPC, enter
CHG:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],TS0 abcdefgh!

Where:

<npc No.> = NPC number to be changed.

<range> = Optional, last NPC of continuous range of NPCs.

TS0 Field = Variables a through h represent bits per Table 10-2.

The values for the bits are: 0, 1, P, or dash (-).

P is for passed-through (unchanged), and a dash is for not affected.

⇒ NOTE:

The dash means that the bit will not be affected by this change. In other words, the existing setting or default will be maintained.

⇒ NOTE:

The defaults for the TS0 bit settings are: 11011111 (for all types except TRANSMIC 1G) and 11000000 (for TRANSMIC 1G).

- If the command is denied, find the meanings of the denial codes in *Command Denials*.

4. Check the OLD and NEW fields in the output message to verify that the information was entered correctly.
5. To restore monitoring on the NPC after the overflow condition is cleared, enter
RST:[FRM xy,SEQ ww]:NPC <npc No.>[-<range>],TS0M!.

Check CBOFL Message

Overview: A buffer overflow message is registered for a CPR pack when the number of C-bit change reports exceeds the capacity of the buffer (approximately 1024). Once an overflow occurs, the CPR stops monitoring C-bits until a restore MON command is entered at the DACS II. The buffer overflow message names the involved CPR pack and the facility NPCs with messages in the CPR and the C-bit activity for the 30 channels on those facility NPCs.

1. Notice the reporting CPR number and notice whether particular facility NPCs are reporting larger numbers of C-bit changes than the others. Each of the 15 digits after the facility NPC number represents two channels. See Figure 10-1.

Hexadecimal word (X-abcdefghijklmno):

Digit a = represents channels 1 and 2

Digit b = represents channels 3 and 4

Digits c-n = represents channels 5 to 28

Digit o = represents channels 29 and 30

Each Hex Digit Decodes into Four
Binary Bits (for Two Channels)
Which Have Following Meaning:

00 = no activity

01 = one change

10 = 2 to 5 changes

11 = more than 5 changes

HEX A=1010, B=1011, C=1100, D=1101,
E=1110, F=1111

Figure 10-1. Construction of Hexadecimal Word

2. If particular facility NPCs have higher C-bit change counts, check for error messages on those facilities and enter

UTL : : QRY, STATE, NPC <npc No.> ! for the NPCs to check for high error counts for the facility parameters See Table 10-5. For PA type NPCs, refer to Table 10-6.

Where <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

⇒ NOTE:

To avoid tying up the link with changed state messages from all the channels being monitored, you will have to find the cause of the overflow before you restore monitoring.

- If high facility errors are found, you may need to clear the facility error problem per *Facility Alarms*.
 - If high facility errors were NOT found, either the excessive C-bit changes are occurring because of conditions on the circuits or the equipment has not been provisioned correctly to do the monitoring.
3. To stop the C-bit pattern insertion to channels connected to the CPR pack, enter the following for the circuit or range:

CHG : [FRM xy, SEQ ww] : BC0FF, TO <npc No.>ddd[-eee][, INCL] !

Where:

<npc No.> = NPC number of facility termination,
either extended (for example, [0]001)
or hierarchical (for example, 01101).

ddd = Channel number (01 through 30) on same NPC for subject circuit.

eee = Optional, to name last channel of range of circuits associated with same CAS signal; up to 30 channels.

INCL = Required to change C-bit pattern designated as red special circuit.

- If the command is denied, find the meanings of the condition codes in *Command Denials*.

4. If you want to change (or disable) monitoring the C-bits for channels of particular facilities, enter for the circuit or range of circuits connected to the CPR pack:

CHG:[FRM xy,SEQ ww]:DD(m,w),TO <npc No.>ddd[-eee]!

Where:

m,w = Specifies monitoring (m) and/or writing (w) the c-bit pattern at the CPR pack. Enter one of the following for each: 1 to enable, 0 to disable, and a dash (-) for no change from existing.

- If command is denied, find the meanings of the condition codes in *Command Denials*.

5. To restore monitoring after an overflow, enter the following command for the CPR pack named in the overflow message:

RST::NPC <npc No.>,MON!.

⇒ NOTE:

After the completion message, there will be accompanying information messages showing that monitoring of c-bits has been restored on the connecting NPCs.

Table 10-5. Facility Status Keywords

Keyword	Meaning	Output Information
OOS/FAIL/ PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	R = red alarm, Y = yellow alarm, A = AIS, B = BER, E = REER, I = RAIS, L = LMA, M = R16, S = sync fail indication, V = A16, X = EER, 1 = PBA, or 0 = no PBA.
DM	Degraded Minutes	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
SERS	Severe Errored Seconds	Same format as for DM.
ERS	Errored Seconds	Same format as for DM.
US	Unavailable Seconds	Same format as for DM.
SLIP	Timing Slip	Same format as for DM.
CRC	Cyclic Redundancy	Same format as for DM.
FRER	Frame Bit Error	Same format as for DM.
LOFA	Loss of Frame Alignment	Same format as for DM.
MER	Multiframe Alignment Error	Same format as for DM.
COFA	Change of Frame Alignment	Same format as for DM.

Table 10-6. Facility Status Keywords (PA Type NPCs)

Keyword	Meaning	Output Information
OOS/FAIL/ PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	0 = No PBA. 1 = PBA exists for one or more of the following: LOS - loss of signal LOF - loss of frame AIS - alarm indication signal EER - excessive error rate RAI - remote alarm indication LMA - loss of multiframe alignment LCMA - loss of CRC4 multiframe alignment BER - bit error rate A16 - AIS received in time slot 16 RAIS - remote AIS RBER - remote bit error rate RMA - remote multiframe alarm SFI - synchronization failure indication PFWOOF - pseudo frame word out-of-frame FLCMA - far-end LCMA. A 1 under any of the headings listed above indicates that the condition exists.
CRC	Cyclic Redundancy Code	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
FRER	Framing Errors	Same format as for CRC.
OFS	Out-of-Frame Seconds	Same format as for CRC.
ES	Errored Seconds	Same format as for CRC.
SES	Severely Errored Seconds	Same format as for CRC.
CSS	Controlled Slip Seconds	Same format as for CRC.
CV	Coding Violations	Same format as for CRC.
UAS	Unavailable Seconds	Same format as for CRC.
UATC	Unavailable Time Count	Same format as for CRC.
MER	Multiframe Errors	Same format as for CRC.
FEBE	Far-End Block Errors	Same format as for CRC.
FES	Far-End ES	Same format as for CRC.
FSES	Far-End SES	Same format as for CRC.
FUAS	Far-End UAS	Same format as for CRC.

Check Status of C-Bits Message

Overview: Receipt of this message shows that either the c-bit pattern on a facility has changed or the status of the c-bits has changed to idle (all 0s) or network alarm. If the pattern changed, the new pattern will be given so that it can be decoded to see which bits changed. The facility NPC number in the message relates the c-bits to the circuits (liaisons).

1. Read what is given under the STATUS OF C-BITS part of the message. It will be one of the following:
 - “ZO” which means that there is an all 0 (idle) pattern of C-bits
 - “NA” which means that the normal or prescribed pattern of C-bits has been interrupted because of a network alarm
 - The 4-digit hexadecimal word of the form X-abcd which gives the new C-bit pattern. See Figure 10-2 to decode the bits.

Hexadecimal word (X-abcd):

Digit a = bits 0,1,2,3 of C-bit pattern
(Note: Bits 0 and 1 cannot be set;
thus, valid values are a=0,1,2, or 3)

Digit b = bits 4,5,6,7

Digit c = bits 8,9,10,11

Digit d = bits 12,13,14,15

Figure 10-2. Construction of Hexadecimal Word

2. Notice the NPC number which relates the message to a facility and circuit (liaison).

Enter C-Bit Query Commands

1. Proceed as follows for the type of information that is required:
 - If **DIRECTOR FUNCTIONS OF C-BIT(S) FOR CHANNEL/CHANNEL RANGE**, continue with Step 2.
 - If **DIRECTOR FUNCTIONS ON NPC/NPC RANGE**, proceed to Step 3.
 - If **C-BIT STATE AND PATTERN FOR CHANNEL**, proceed to Step 4.
 - If **C-BIT STATE AND PATTERN FOR NPC/NPC RANGE**, proceed to Step 5.

2. Enter the following command for the desired channel or range of continuous channels:

UTL:[FRM xy,SEQ ww]:QRY,DD <npc No.>ddd[-fff]!

Where:

xy = Optional, DACS II frame number (00 through ZZ).

ww = Optional, command sequence number (00 through 49).

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number of circuit (liaison); 01 through 30.

fff = Optional, last channel of range of channels on same NPC; maximum range 30.

- If command is denied, find the meanings of the condition codes in *Command Denials*.

Proceed to Step 6.

3. Enter the following command for the desired NPC or range of NPCs:
UTL:[FRM xy,SEQ ww]:QRY,DD,NPC <npc No.>[-<range>]! or
 to see all transmit director DACS II c-bits enter

UTL:[FRM xy,SEQ ww]:QRY,DDCT,ALL!

Where:

<npc No.> = NPC number of facility or bridging NPC, either extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, last NPC number of range of NPCs.

{DD | DDCT} = Either DD for director DACS II or DDCT for director DACS II with data base coherence feature.

- If the command is denied, find the meanings of the condition codes in *Command Denials*.

Proceed to Step 6.

4. Enter the following command for the desired circuit (liaison):
UTL:[FRM xy,SEQ ww]:QRY,BC s,TO <npc No.>ddd!

Where : s = Selects C-bit information (state and pattern) for either C-bits received by CPR (s = R) or transmitted from CPR (s = T).

- If the command is denied, find the meanings of the condition codes in *Command Denials*.

Proceed to Step 6.

5. Enter the following command for the desired NPC or range of NPCs:
UTL:[FRM xy,SEQ ww]:QRY,BC s,NPC <npc No.>[-<range>]!
 or to see all C-bit patterns enter
UTL:[FRM xy,SEQ ww]:QRY,BC s,ALL!

Where: s = Selects C-bit information (state and pattern) for either C-bits received by CPR (s = R or D) or transmitted from CPR (s = T). Option D gives a condensed format; ALL command can only be used with s = D.

- If the command is denied, find the meanings of the condition codes in *Command Denials*.

6. Read the information from the output message using the following guidelines:
- For the "Provisioning of C-BIT as DD" output for the UTL QRY ...DD query, "0" means not selected and "1" means selected. The output for each channel is in the form -mw for monitor, write; this format is repeated for all channels on NPC or range of NPCs as requested.
 - For the "STATUS OF C-BIT" output for the UTL QRY ...BC query, the status of the c-bits for each channel is given as one of the following: ZO for all zeros (idle), NA for network alarm, UP for not provisioned, or UN for undetermined, or framed.
 - If the status of the C-bit is framed and the director DACS II function for the C-bit is to write, the C-bit pattern inserted by the CPR will be given for the channel or range of channels. The construction of the hexadecimal word giving the insertion pattern for each channel is given in Figure 10-3.

Hexadecimal word (X-abcd):

Digit a = Bits 0,1,2,3 of c-bit pattern
(Note: Bits 0 and 1 cannot be set;
thus, Valid Values Are a=0,1,2,or 3)

Digit b = Bits 4,5,6,7

Digit c = Bits 8,9,10,11

Digit d = Bits 12,13,14,15

Figure 10-3. Construction of Hexadecimal Word

Check Type PB/PC NPC Status

1. Enter **UTL::QRY,STATE,NPC <npc No.>[-<range>]!**

Where:

<npc No.> = NPC number, given either as extended (for example, [0]001)
or hierarchical (for example, 01101).

<range> = Optional, for facility NPCs to name last NPC of range.

2. Convert the NPC type designation (xyz) to binary and read the meaning of the bits as follows:
 - Work with each of the three digits following the PB or PC keyword individually.
 - Write the 4-digit binary equivalent of each Hex digit.
See Table 10-7.
 - Match the 0s and 1s with the options in Table 10-8. Only bits a through g (for Hex digits xy) are used in the basic 2.048-Mb/s feature.
3. In the output message, notice the IW (insertion word). This code word is sent on the message channels that are not connected in cross-connections.

Table 10-7. Hex and Binary Equivalents

Hex Number	Binary Number			
Digit x	Bit a	Bit b	Bit c	Bit d
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Table 10-8. PB/PC NPC Type Specification

Hex	Bit	Value	Meaning
x	a	0	CRC-4 multiframe in TS0
		1	Non-CRC-4 framing in TS0
	b	0	NPC is not used as a synchronization source
		1	NPC is used as a synchronization source
y	c	0	CCITT G.732 Consequent AIS in signaling
		1	Specified consequent action; <tc> field in commands
	d	0	Nonsignaling associated (NSA)
		1	16-state channel associated signaling (CAS)
z	e	0	Telephone Channel Numbering
		1	Time Slot Channel Numbering (NSA)
	f	0	Convert the abcd bits of TS16 to 1111 if 0000
		1	Pass signaling bits through unchanged
z	g	0	AIS applied to receive TS16 upon RAI, RAIS, or R16
		1	AIS not applied to receive TS16 upon RAI, RAIS, or R16
	h	0	TS0 bit 5 = SFI unaffected by synchronizer holdover
		1	TS0 bit 5 = SFI inverted on synchronizer holdover
z	jkl	000	TS0 bit 3 = RAI indication within 2 ms.
		001	TS0 bit 3 = RAI indication in t^*
		010	TS0 bit 4 = RAIS in t^* and RAI within 2 ms.*
		011	TS0 bit 4 = Detect BER, enable RBER in t^* and RAI in 2 ms.
		100	TS0 bit 4 = RAIS and RAI in t^* (Transmic 2G)*
		101	TS0 bit 4 = Detect BER, disable RBER and RAI within 2 ms*
		110	Bits 3 through 8 in t^* (Transmic 1G)
		111	Unassigned
	m	0	Unassigned, only m = 0 is valid

* When bit c=0, time t is 144 ms; when bit c=1, t is 144 ms for remote alarms, but t is 480 ms for local alarms except for jkl = 011 or 101 (MBER selected). With MBER, t is 2496 ms (SFDT).

Reference: HEX A=1010, B=1011, C=1100, D=1101, E=1110, F=1111.

4. Read the status and facility error counts from the fields of the output message using Table 10-9.

**NOTE:**

There are separate registers for 24-hour accumulated counts, previous short interval counts, and the current short interval (1 hour) counts. Counts are moved to different registers either after the interval expires or when the number of errors exceeds the alarm threshold for the register.

Table 10-9. Facility Status Keywords (PB/PC NPCs)

Keyword	Meaning	Output Information
OOS/FAIL/PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	R = red alarm, Y = yellow alarm, A = AIS, B = BER, E = REER, I = RAIS, L = LMA, M = R16, S = sync fail indication, V = A16, X = EER, 1 = PBA, or 0 = no PBA.
DM	Degraded Minutes	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
SERS	Severe Errored Seconds	Same format as for DM.
ERS	Errored Seconds	Same format as for DM.
US	Unavailable Seconds	Same format as for DM.
SLIP	Timing Slip	Same format as for DM.
CRC	Cyclic Redundancy	Same format as for DM.
FRER	Frame Bit Error	Same format as for DM.
LOFA	Loss of Frame Alignment	Same format as for DM.
MER	Multiframe Alignment Error	Same format as for DM.
COFA	Change of Frame Alignment	Same format as for DM.

Check Type PA NPC Status

1. Enter **UTL::QRY,STATE,NPC <npc No.>[-<range>]!**

Where:

<npc No.> = NPC number, given either as extended (for example, [0]001) or hierarchical (for example, 01101).

<range> = Optional, for facility NPCs to name last NPC of range.

2. Separate the NPC type designation (xyz) into its individual members (x, y, and z) and compare the value of each with Tables 10-10 through 10-12. A 'Y' in a column indicates that the feature at the top of the column is enabled by the corresponding x, y, or z provisioning value.

Table 10-10. x Values for PA Type NPCs

x Value	CRC-4 Mode	Automatic CRC-4	Far-End PM	NPC Used as Sync Sourc	TS0 Bit 5 Used for SFI
0	Y				
1	Y		Y		Y
2	Y				Y
3	Y		Y		
4	Y			Y	
5	Y		Y	Y	Y
6	Y			Y	Y
7	Y		Y	Y	
8		Y	Y		
9		Y	Y		Y
A					Y
B					
C		Y	Y	Y	
D		Y	Y	Y	Y
E				Y	Y
F				Y	

NOTE: Although a value of B does not enable any of the features shown in the table, it is a valid value for x.

Table 10-11. y Values for PA Type NPCs

y Value	CAS Mode	NSA Mode	Telephone Numbering	Timeslot Numbering	Convert CTS 16	AIS in CTS 16	Framed Clear	Unframed Clear
0	Y		Y		Y	Y		
2	Y		Y		Y			
4	Y		Y			Y		
6	Y		Y					
8		Y	Y					
9		Y		Y				
C							Y	
D								Y

NOTE: Values 1, 3, 5, 7, A, B, E, and F are unassigned and not valid.

Table 10-12. z Values for PA Type NPCs

z Value	C.A. Timing		RAI Set Time			NFW Bit 4 Use		RAIS Set Time		MBER Enabled
	HW	FW	2ms	144ms	480ms	RAIS	RBER	144ms	480ms	
0	Y		Y							
1		Y	Y							
2	Y			Y						
3		Y			Y					
4	Y		Y			Y		Y		
5		Y	Y			Y			Y	
6	Y		Y				Y			Y
7		Y	Y				Y			Y
8	Y			Y		Y		Y		
9		Y			Y	Y			Y	
A	Y		Y							Y
B		Y	Y							Y
C	Y									

NOTE: Values D, E, and F are unassigned and not valid.

3. Read the status and facility error counts from the fields of the output message using Table 10-13

**NOTE:**

There are separate registers for 24-hour accumulated counts, previous short interval counts, and the current short interval (1 hour) counts. Counts are moved to different registers either after the interval expires or when the number of errors exceeds the alarm threshold for the register.

Table 10-13. Facility Status Keywords for PA Type NPCs

Keyword	Meaning	Output Information
OOS/FAIL/ PEST	Out-of-Service/ Failed/Pested	1 = NPC out-of-service/failed/pested.
PBA	Primary Block Alarm	0 = No PBA. 1 = PBA exists for one or more of the following: LOS - loss of signal LOF - loss of frame AIS - alarm indication signal EER - excessive error rate RAI - remote alarm indication LMA - loss of multiframe alignment LCMA - loss of CRC4 multiframe alignment BER - bit error rate A16 - AIS received in time slot 16 RAIS - remote AIS RBER - remote bit error rate RMA - remote multiframe alarm SFI - synchronization failure indication PFWOOF - pseudo frame word out-of-frame FLCMA - far-end LCMA. A 1 under any of the headings listed above indicates that the condition exists.
CRC	Cyclic Redundancy Code	First line under header gives the number of occurrences. Second line gives the alarm threshold. Third line gives the selected option for alarm threshold 0 (default) or 1, 2, or 3 (defined options in data base).
FRER	Framing Errors	Same format as for CRC.
OFS	Out-of-Frame Seconds	Same format as for CRC.
ES	Errored Seconds	Same format as for CRC.
SES	Severely Errored Seconds	Same format as for CRC.
CSS	Controlled Slip Seconds	Same format as for CRC.
CV	Coding Violations	Same format as for CRC.
UAS	Unavailable Seconds	Same format as for CRC.
UATC	Unavailable Time Count	Same format as for CRC.
MER	Multiframe Errors	Same format as for CRC.
FEBE	Far-End Block Errors	Same format as for CRC.
FES	Far-End ES	Same format as for CRC.
FSES	Far-End SES	Same format as for CRC.
FUAS	Far-End UAS	Same format as for CRC.



Command Denials

11

Contents

Clear Command Denials

11-1

Clear Command Denials

1. If you have one of the following word strings in the denial message, read the associated information and perform corrective action to obtain command completion.
 - **INACT** - The INACT message indicates that the command is invalid with the feature package being used.
 - **BAD SYNTAX** - Determine the portion of the command that was in error from the designator (BAD VERB/FRM ERR/SEQ ERR) in the message and reenter the command with the correct information. If you do not understand how to correctly construct the command, you can get on-screen help using the help routine (initiated by entering a question mark, ?).
- ⇒ **NOTE:**
The DACS II indicates where the input error occurred, by placing = signs around the word or portion in the echoed command.
- **ERR, ABT** - Reenter the command; a transient frame condition may have caused the command to be aborted. If the command is aborted again, check the printout to find associated trouble messages.
 - **MC OOS** - The MC (main controller) must be restored to service to execute the command.

- **MCOND** - The MC is in the maintenance condition, and only commands which are considered frame maintenance commands can be used.
 - **MC INSERVICE** - The MC must be in the maintenance condition to execute certain PMEM and SMEM commands.
 - **MPDBASE** - The main processor data base is not loaded.
 - **RESTRICTED, STOPPED** - Only users who have been assigned the use of restricted maintenance commands can use the command. The use of this set of commands is enabled by the frame administrator who enters the ADD command with option RMON for the user.
2. If you received a COND cc DNY message, find the meaning of the COND code in Table 11-1.

**NOTE:**

Since only the last 2 digits of the condition code appear in the message, some of the codes have multiple meanings. If any meaning in Table 11-1 is not appropriate for the command that was denied, check the other meanings.

3. Command denials can be categorized under common causes. Check the following descriptions and, if applicable, perform corrective action to obtain command completion.
- **Input Error** - Check each field of the command entry on the screen or printout against the documented command to find the error.
 - **Not Equipped, Not In-Service, or Failed** - The named equipment is not grown (equipped) or in-service to support the execution of the command. The commands to grow and restore the plug-in to service are covered in provisioning in Volume 1, and procedures to clear failed plug-in and trouble messages are in this trouble-clearing volume.
 - **Incorrect NPC/Channel Number** - Check each side of the cross-connect command to find incorrect numbers that are already assigned or assigned differently. There are query commands in the cross-connect procedures to obtain information about existing connections on the frame.

- **Invalid Parameters** - Check each field of the command entry against the documented command to determine which keyword is incorrectly used.
- **Boot Failed** - This is a specific restore command denial. Reenter the restore plug-in command and subsequent diagnose command in an effort to get a DGN ...STF message for which there is trouble clearing in the respective trouble-clearing chapter. If no DGN ...STF message is obtained but the denial persists, replace the plug-in to be restored.

Table 11-1. Frame Denials

cc	<i>Explanation</i>
00	No conditions
01	Assignment of single priority to multiple SSPs Backup required before executing this command Invalid range for specified NPC type No FADs were activated by link n No test ports were activated by link n Subject entity is equipped
02	Invalid NPC type for AIS insertion Manual Pending is Active One or more FADs could not be released One or more test ports could not be released Subject entity is not equipped
03	DS3U NPC already In-Service No RDC or CUS circuits and INCL keyword used Subject entity is in service This NPC type does not allow unframed Clear-DS1
04	MONDAT keyword is invalid for this feature No NPC's out of service and OOS keyword used Subject entity is out of service This NPC type does not allow Payload
05	Invalid parameter combination Invalid use of CONV keyword Subject entity is pested This NPC type does not allow unframed Clear-DS1
06	Device failed to format Invalid range for specified FROM NPC type Mismatch between MXR and MIU HDW types
07	Device failed to initialize Invalid range for specified TO NPC type Mismatch between MXR and NPC types
08	Cannot remove own link Invalid FROM NPC type for AIS insertion Mismatch between service MXR and protection MXR types
09	Invalid TO NPC type for AIS insertion Last link in service Wrong MXR type grown for this MIU
0A	All CBTYPE NPCs out of service or failed DGN on subject entity failed Minor Slip threshold disabled before Major Slip threshold
0B	Another signal already active prevents this signal from being sent BOOT on subject entity failed Invalid CEPT NPC
0C	DGN on subject entity denied PM scheduling report is already inhibited for this entity The MONDAT and MONTIM parameters can not both be specified

cc *Explanation*

- 0D** PM scheduling report is already allowed for this entity
Unpestering error registers for subj. entity failed
- 0E** No equalization for CEPT FTMI
Only one parameter is allowed
The specified parameter is not applicable to operation mode of the RT
- 0F** Frame time is not set
Side specified for non-duplicated NPC
- 10** NPC out of service or failed
RT's alarm exists
Unit is not equipped
- 11** NPC not equipped
PMEM type no longer supported
UC is out of service
- 12** Active CCN side not IS or failed or pestered or hardware OOS
First and Last NPCs are outside unit boundary
UC is in service but failed
- 13** FTMI is not equipped
First and Last NPCs are outside a module boundary
UNIT not equipped, not in service, or failed
- 14** 1 hr $\geq$ 24 hr for DM opt
CCB not eqd, not IS, or failed or inactive side CCB not eqd or not IS
FTMI is out of service
OFFSET range is invalid
- 15** 15 min $\geq$ 24 hr for SERS opt
FTMI not equipped, not in service, or failed
NPC is unequipped
- 16** 15 min $\geq$ 24 hr for ERS opt
FC not eqd, not IS, or failed or inactive side FC not eqd or not IS
FC not eqd, not IS, or failed or inactive side FC not eqd or not IS
Only up to 4 historical data registers are allowed
SYNC TB is not equipped
- 17** 15 min $\geq$ 24 hr for US opt
Command did not execute for any entity specified in the command
SYNC is out of service
TSI not eqd, not IS, or failed or inactive side TSI not eqd or not IS
- 18** 15 min $\geq$ 24 hr for SLIP opt
CCNI is out of service
DSPI not equipped, not in service, or failed
DSPI not in service or failed
Exceeded limit of reports with accum. interval of 15 min. or less
- 19** Exceeded maximum limit of PM reports
Mate CCN side is out of service
Test ports must be on CAS
- 1A** Mate SYNC is out of service
Report already exists
Required FLI not equipped, not in service, or failed
The facility parameter not programmable for specified x or z parameter

cc *Explanation*

- 1B** CCN side s is in service
Historical data can not be specified
Required MXR not equipped, not in service, or failed
Two digroups from same bank added to different FTMI's
- 1C** CCN side s is out of service
Reqd FMT not eqd, not IS, or failed, or inact side FMT not eqd, or not IS
- 1D** Level field is not allowed
Required MIU not equipped, not in service, or failed
- 1E** Customer control or red circuit exists
Monitored Date field is not allowed
Monitored Date field is not allowed
- 1F** FTMI is in service but failed
Scheduled reporting for this npc is inhibited
- 20** Line format types are incompatible
Only DAILY for accumulation interval is allowed
Only DAILY for accumulation interval is allowed
Option rr/m has not been set up on 2nd database
Software Identification Block is not readable
- 21** Minor >= major for SLIP opt
Only 15MIN for accumulation interval is allowed
Only 15MIN for accumulation interval is allowed
Software Identification Block failed comparison
Trunk conditioning is invalid
- 22** FMC cannot be cross-connected in this format
FTMI is PESTED
Minor <= major for BER opt
Release number mismatch
- 23** Minor >= major for COFA opt
No PM data available
No PM data available
Point number mismatch
- 24** Monitored Time field is not allowed
Monitored Time field is not allowed
PDI Version number mismatch
Unit type error
- 25** Accumulation Interval field is missing
FTMI type error
Invalid FPI value
- 26** Feature deactivation would leave system with core software
NPC type error
- 27** Disable not allowed - supports another feature
Illegal connectivity specified
Only historical data can be specified
- 28** Connectivity contains unequipped units
Feature is active
Scheduling report could not be found
- 29** Feature not enabled

cc *Explanation*

IW is UMUX (18) but NPC not type DE4yz
This signal is already being sent

2A DMI combined with T1DM

Database not loaded
Deny Clear-2MB for Alternate Maps
Incorrect pack type in slot

2B Bit c not settable

Database corrupt
Maj|Min BER threshold is 7, but not in T1DM or Fe mode
Reading Feature Package Id from PMEM failed

2C Write to CPR failed

Writing Feature Package Id to PMEM failed
not allowed for clear 2MB

2D RTF keyword is used without DGA

TS0 is crossconnected to TS0

2E RTF keyword and the operation mode does not match

bit value not allowed for NPC type

2F Channels assigned, cannot be grown as test port

TS0 connected to nonTS0 in Mode 2 - "a" should be "-" or equal to "b"
The RT id entered is not a retrofit one

30 NPC not provisioned for CAS

No signals active
Termination is already assigned
Unit is not FTU type

31 Accumulation Interval field is not allowed

Failed to switch SYNC side
NPC not provisioned for NSA

32 Bit 3 provisioned for use as RA13

Termination is under test
Threshold value is out of range

33 Bit 4 provisioned for use as RA1S

NPC not DA or TA type.
Termination is a test port
Wrong TLI type

34 NPC type option xyz is unassigned

NPC type option xyz is unassigned or invalid for feature package
Termination is under customer control (CUS)

35 Invalid use of INCL keyword

NPC has active circuit
Termination is protected (RDC)
The mate FLI is OOS and Protection MIU is equipped

36 DSPI not equipped

INCL keyword needed when restricted Insertion Word specified
TD on one(both) sync(s) is not equipped or not in-service
Termination is not connected as indicated

The mate FLI is OOS and Protection MXR is IS

37 DSPI out-of-service

cc *Explanation*

- Major/Minor BER threshold value is invalid for SLC NPCs
- Selected FLI has LOC with at least one inservice MXR
- The mate FLI is OOS and at least one Service MXR is equipped
- Two confs. were prev. connected or the concat. cause BRD-BBL loop
- 38** Deny SP Type NPCs for Alternate Maps
- FC not equipped
- The selected FLI is IS and Pested and at least 1 Service MXR is eqd
- Unselected FLI has LOS with at least one inservice MXR
- 39** An autonomous switch is in progress
- MXR LOS with unselected FLI
- Not enough TSIs for CCB test
- Signaling state of the trunk failed for the channel
- 3A** Bit 4 provisioned for use as RBER
- Invalid FPI value
- Invalid poll time
- No unmapped slots on a bus
- 3B** Bit 5 provisioned for use as SFI
- Not valid for frame administrator
- Unspecified L2 address
- 3C** Bits 3 through 8 are provisioned for Transmic 1G
- Duplicate L2 address
- TS0 specified with width not 1
- 3D** Alarm bits cannot be passed through or inverted
- Illegal test access mode for TS0
- No mapped slots on a tsi
- 3E** DSPI failed
- Mapped slots exist on a tsi
- TS16 specified for test with width not 1
- 3F** Conference exists in a DMB
- G4 to G4.1 retrofit failed
- Illegal test access mode for TS16
- 40** CCN denied request
- FC out of service
- Not enough DSPPs are equipped
- Only one channel allowed to have this language
- Signaling processing is not activated for the channel
- The service FLI is out of service or pested (TOSRVC option)
- 41** Failed to boot subject CCN side
- Language "F" provisioned for this channel
- Not enough DSPPs are in service
- The protection FLI is out of service or pested (TOPRTN option)
- 42** Change not valid
- DSPP not in service, or failed
- RST failed to boot program
- The service FLI is already selected (TOSRVC option)
- 43** (NPC) Hardware mismatch
- RST failed to boot DB

cc *Explanation*

- The protection FLI is already selected (TOPRTN option)
Trying to change in NTR direction
- 44** Invalid direction specified for NTST TLA/TLR
NPC not IU/TI type
Service MXR is not equipped
- 45** A DMB on the UNIT is OOS
IU/TI type NPC failed
NPC not provisioned as DGA
Service MXR is out of service
- 46** Failed to boot CONF file
NPC Failed or Out of Service
Service MIU is out of service
virtual SLC NPC not provisioned
- 47** Failed to boot DB
IU/TI type NPC
Invalid channel number
Protection MXR is out of service
- 48** Bad PRIM X'efgh values
Failed to boot journal--recurrence indicates database corruption
Invalid SLC Mode-III channel number
Protection MIU is not equipped
- 49** FAC keyword is invalid for this feature
Failed to boot unit
Protection MIU is out of service
test group unequipped
- 4A** PRIM keyword is invalid for this feature
Red circuit, INCL not entered
SMEM error, boot from PMEM
The protection MMFG is serving another facility
channel part of a TP or TG
- 4B** Customer controlled circuit, INCL not entered
PMEM error, boot from SMEM
The Service MMFG is already under protection
The common bit(s) is(are) not set in both FAC & PRIM
channel already under test
- 4C** BCON BBL has one or more legs under test
Both FAC and PRIM values(keywords) are required
Failed to boot CI
The Service MMFG is not under protection
- 4D** DSPI is in service
Gateway test access not supported
MP database not consistent with Configuration file
The switch is allowed (not inhibited)
- 4E** IW option is not allowed for new type of Clear-DS1 NPC
RTBC conference exists
The switch is already inhibited
- 4F** BER must not be less than 4 for Clear DS1

cc *Explanation*

- NPC is not part of a one-way connection
inconsistent BCON width for test access
- 50** CPR in buffer overflow condition
Can't run test on active side
Invalid MIU/MXR type specified
Trunk conditioning doesn't match that of conference
invalid channel designation for BCON
- 51** C-bit modify function is disabled
CUS flag doesn't match that of conference
General boot failure (vanilla flavor)
TG width incompatible with circuit
The pair MXR is not equipped
- 52** CPR is not equipped
Database is empty
FDL selected with width not 1
RDC flag doesn't match that of conference
The MMFG is protected
- 53** CPR is out of service
Database is not empty
TO side of two-way to be converted is not an FTU NPC
The associated MMFG is under protection (for Service MIUs)
inconsistent HUB width for specified TG
- 54** Conversion leg is terminated
Cross-connect to CPR is required
The MIU is already equipped
invalid mode for TLA/TLR
- 55** Invalid CFT code
Some associated NPCs are equipped
Width of existing two way does not match conference width
circuit already terminated
- 56** FROM is a two-way and no CONV specified
The MXR is in service
Unrunnable CFT code
circuit not terminated
- 57** Designated TG or circuit to be tested in process of being rolled
FROM is not a backbone leg
SIDE must be specified for substrate NPC
- 58** DSPU is not equipped
NPC is OOS for a TGR command and OOS keyword not specified
SLC 96 MD 1 RT DGP requires mate NPC to be unequipped
Specified width does not match existing conference width
- 59** DSPU unit controller is out of service
Invalid TC specification
NTR invalid since existing conference is not already NTR
Number of DGPs on each unit is limited to 32
- 5A** DSPU unit controller is failed
LPD invalid since existing conference is not already LPD

cc *Explanation*

- NPC not in service or failed
- 5B** C-bit modify function is active
TO is not a leg of this/any conference
channel is OCON in opposite direction
- 5C** Can't disconnect return leg unless entire conference disconnected
Inconsistent or invalid circuit type for Nx64Kbit TA
NPC providing timing to inservice SSP
- 5D** Inconsistent Signaling on CEPT NPCTGs
Sync source NPC is not inservice
TO is the backbone leg of a conference
- 5E** Sync source NPC is not equipped
TO is a part of the same conference as a previous TO
invalid test access mode
- 5F** Conference is NTR: has no switchable return leg
input channel out of range (SLC not supported)
- 60** Conference is LPD: has no switchable return leg
Selectable AIS not valid for specified NPC(s) type
User macro/map space is full
circuit contains mapped channels for HUB request
- 61** All NPC(s) are either not valid or not grown
System macro/map space is full
TO is already the return leg
not all FROM channels on same NPC
- 62** File is being accessed
IU type NPC(s) cannot be provisioned for Minor Alarm
Invalid channel number
NPC type mismatch
None of the designated NPCTG(s) are equipped
- 63** File already exists
NPC is a DGP
NPC is a channelized NPC
None of the designated TG(s) are equipped
- 64** File doesn't exist/can't be accessed
Frame is not in MCOND
NPC is a non-channelized NPC
NPC is already grown and added as SLC digroup
TG width too large for single NPCTG
- 65** Another NPC is grown and added as this digroup
Command invalid while backup in progress
Ending channel is out of range
Link being used is not Link 1
- 66** DGP designated to bank without data link
Map/macro file write deferred until backup is completed
TG number previously assigned
User login-id is not DAX
- 67** DGA is not added
Improper roll command sequence

cc *Explanation*

- NPC(s) actual type incompatible with TYPE keyword and/or alarm type
 User logged off during session
- 68** Incorrect language/addressing mode
 NDL option is used without DGA
 NEW NPC already cross-connect or mapped channel(s) on new
- 69** Incorrect number of parameters
 Mapped parity channel(s) on new
 Use of this NPC is RESERVED for SLC 96 MD 1
- 6A** NPC type is not DS type
 New in CGA or PBA
 No macro is currently executing
- 6B** Invalid line number
 No mapped channel on old
 Operation mode and digroup name don't match
- 6C** File is empty
 Framing format, digroup name & operational mode don't match
 Old and new chan on same NPC and within the range
- 6D** Counting sequence and operational mode don't match
 One NPC is a non-channelized type and the other is not
- 6E** DGA with NDL option is not provisioned with D4 or ESF framing format
 No edit session active
 Old or new is a non-channelized type in a DS0 command
- 6F** Adding two digroups from one bank on same DDC
 The OLD or NEW NPC is already being rolled.
 The session is terminated due to maintenance operation
- 70** Digroups from same bank have different modes
 NPC invalid type
 One of the FAR end channels is being rolled
 Some circuits not activated,cleared or pictured
 Try to add a BBL to VC,but the VC already has backbone
- 71** Digroups from same bank have different counting sequence
 NPC is a Facility Access Digroup
 The reference map does not exist
 Try to delete a BBL leg from VC;however, VC has no BBL leg
 Unmapped channel(s) on old
- 72** Digroups from same bank are added to two different FTUs
 Invalid test mode for an unmapped test session
 One of the far NPC(s) is SLC
 The NPC of VC BBL leg doesn't match that in the input command
 The map is not valid
- 73** Both sides of CCN are OOS
 Channel has a FAR, which is within the range
 Invalid PWR/MISC alarm level
 Invalid test mode for a one-way test session
 The first channel of VC BBL leg doesn't match that in the input command
- 74** At least one UC is OOS or At least one UC is failed
 Old and new are the same NPC in a DS1 command

cc *Explanation*

- PWR/MISC alarm is specified to a digroup other than DGA
 Try to delete a BRD leg from VC; however, VC has no BRD leg
- 75** At least one UC is not the correct type
 Old and new channels have not been paired by a BCAST command.
 Test session already exists
 The input BRD leg is not in VC
- 76** AIS not entered for SPLTE/SPLTF/SPLTEF/LOOPE/LOOPF
 Alarm option and bank mode don't match
 Channel or NPC not bridged
 The first channel of VC BRD leg doesn't match that in the input command
- 77** Obsolete circuit type
 Tried to disconnect a nonexisting VC
 Unassigned operational mode
- 78** Protection switch process failed
 Ranges of old and new do not match
 Try to operate a ONE-WAY conference with a TWO-WAY input command
- 79** DCTN conference channel cannot be rolled
 DGA/DGP of RT/DL Mode I must be assigned to one DDC
 NPC is not a Facility Access Digroup
 Try to operate a TWO-WAY conference with an ONE-WAY input command
- 7A** Mode I RT/DL IDs don't match for DGA/DGP on same DDC
 NPC is not an E-end
 Testport/testgroup channel cannot be rolled
 The NPC to delete has not been previously added to map
- 7B** Channel out of bound in a BCON/v.c
 Invalid change from previous mode
 Other NPC on this DDC not the same digroup for Mode I DGA/DGP
- 7C** Different DSxyz types are used for DGA/DGP on same DDC for Mode I
 Logical conflicts found in the map
 NPC is not a F-end
 Parity channel out of bound on new
- 7D** Can't start new session - previous session still verifying
 Not first channel in a BCON/virtual conf
 The NDL options are different for DGA's on the same DDC for Mode I
- 7E** Bank id number not found
 Framed/Unframed clear 2Mbit/s NPC invalid for Automatic CRC-4
 Insufficient data for setting up a conference
- 7F** NPC is not added
 No OOS keyword is given for out-of-service NPC
 Unframed clear 2Mbit/s NPC invalid for TS0 processing
- 80** Database conference width does not match the range in input command
 Framed/Unframed clear 2Mbit/s NPC invalid for Transmic 1G, 2G
 Inconsistent channel range width
 NPC number and bank id don't match
 Some TSIs to degrow are in service
- 81** Conference Port is currently registered to a different channel
 Frame ID is protected

cc *Explanation*

- Framed/Unframed clear 2Mbit/s NPC invalid for Firmware Timing
 Invalid input BBL as fmd in ONE-WAY command
 NPC number and digroup name don't match
- 82** Can not use 12-th TP when NPCTP is in the T1DM or DMI mode
 DL ffff is used w/ operational mode other than Mode I
 Invalid input BRD as tmd in ONE-WAY command
 Unframed clear 2Mbit/s NPC invalid for Bit 4 used as RA IS/RBER
- 83** Attention: preceding ccode 83 is an anomaly - see problem list
 Conference Port is already registered to the same group of channels
 Invalid input BBL in terminated TWOWAY/ONEWAY command
 Language is not allowed
 NPC type is inconsistent with FTMI type
 Option not programmable for this NPC type
- 84** Channel(s) is already registered
 Incompatible types of NPCs in a DDC
 Mate NPC is not equipped
 NPC is non-channelized
 Problem occurred while accessing SMEM or unformatted SMEM
 Trying to add or delete a leg when a conference is under test
- 85** IW not allowed to be specified in Clear 2Mbit/s
 Input BRD (BBL) has same NPC and channel as BBL (BRD)
 NPC has been designated as NPCTP
 New bank id is an assigned one
 Problem occurred while accessing PMEM
 Using the 24th channel of a T1DM NPC
- 86** Attempt to remove DGA w/o INCL keyword or prior prot. sw. request
 NPC is NPCTG and chan 24 is used in a TG; Can't change to T1DM or DMI
 NPC number out of range
 Source does not contain requested information
 Using the 24th channel of a DMI NPC
- 87** Copy source NPC is not equipped
 DGP is protecting a primary digroup
 NPC as 12th test port can not change to DMI nor T1DM
 Old_tape is a special install tape
- 88** Conference port is not registered
 NPC is not a NPCTP
 Report interval is not an integral number of accumulation interval
 SMEM is a normal SMEM
- 89** Can't delete because not all associated NPCs of the RT are entered
 Conference port is currently connected
 Interval is not valid/not available
 Interval is not valid/not available
 NPC is not designated for this NPCTP/NPCTG
 Problem occurred while accessing BOTH_MEM
- 8A** Mismatch between channel 0 crossconnect and keywords
 NPCTP is not grown
 x & z parameters on DSxyz are inconsistent

cc *Explanation*

- 8B** Channels and conference port do not match
Digroup name and bank id don't match
PMEM not in service or not ready
Test port is not idle or frame is not inservice
- 8C** DB MP or units ram error
Digroup is protected
The two FADS entered are not associated with one another.
- 8D** Clear gateway test access disallowed.
DB PMEM error OP-CL-RD-WR-SK
RT/DL has unrestored DGA
- 8E** Attempt to add to a null transmitting port
DB can't send or receive mail
DGA protected; use INCL to remove, or unswitch protection
No mapped circuit under test; emode/fmode can't be changed.
- 8F** Can't lock or unlock ram database
NPC not deleted
Number of transmitting ports does not match existing conference
One-way circuit under test; emode can't be changed.
- 90** Can't mount or unmount BOTH_MEM
DB can't get the slave mail box
Invalid change parameter combinations
NDL option is specified for DGA
The total number of receiving ports specified exceeds the max.
emode/fmode can't be changed under current test mode.
- 91** Can't mount or unmount SMEM
Can't mount or unmount password recovery card
Duplicate ports specified
Option not programmable for this NPC type
SR NPC was specified - not allowed
Sync is not configured yet
- 92** Boot TLI failed
Can't mount or unmount PMEM
Transmitting port cannot be dropped
- 93** All digroups not out of service
PA NPC threshold already in inhibit mode
SMEM is not present
TB type in hardware mismatches DB
The conference does not exist
- 94** Conference port is not in conference circuit
Mate RT/DL mode is different
PA NPC threshold already in allow mode
SMEM unit is not restored
- 95** Invalid option, mailbox or flag
Range overlapping between FROM and TO or between two TOs
TG East/West type inconsistent with each other or circuit
- 96** Conference already exists
Subject PWR to be cleared is not failed

cc *Explanation*

- Unit(s) OOS, and additional backup required
- incompatible HUB feature types
- 97** Conference port cannot be dropped out of conference by switch command
- Entity can't be addressed in this configuration
- User quit the menu
- option LOCAL already exists
- 98** Checksums verification failed
- Error in input
- Test Port release failed
- Unable to verify Configuration file since MP DB not loaded
- option REMOTE already exists
- 99** G1 SMEM for SMEM->PMEM w/journals
- No Facility Line Interface (FLI) is In Service
- Unit type (xyz) not supported
- can't change option, protection switch is active
- 9A** Formatter (FMT) on active CCN side is Out-Of-Service
- can't change option, inhibition is active
- hub id not set when MJU pack grown
- 9B** INCL must be specified for SRDC ckts
- Termination is under test or is a test port or group
- The MXR is not grown
- 9C** Parity channel cannot be within the range of a DS0 command.
- SRDC timeslots are allocated on this NPC
- The MMFG is already In-Service
- 9D** Attempt to remove a Service MIU which is under protection
- NPC containing channel 000 is invalid type.
- current hub id specified in command
- 9E** MONDAT set to ALL is not allowed
- 9F** MONTIM set to ALL is not allowed
- current error corrector pack type specified in command
- A0** Illegal LEG LEG combination
- No SAFE alarm for DGP
- Not a CRO TLI
- TS16 specified for CAS TG
- The selected MXR associated with the NPC is Out-Of-Service
- A1** CRO type TLI (SSP portion not required)
- Illegal BBL BBL combination
- Loop back inhibited for digroup
- NPC has been designated as NPCTG
- The parameter specified does not match with the NPC type
- The selected MXR associated with the NPC is In-Service but failed
- A2** All channels assigned, cannot be grown as NPCTG
- Illegal BRD BRD combination
- SSP number is illegal
- The requested digroup is carrying service
- The selected MIU associated with the NPC is Out-Of-Service
- A3** Channels assigned, cannot be grown as test group

cc *Explanation*

Illegal SYM BRD combination
 LLB not initiated
 SSP number required
 The selected MIU associated with the NPC is In-Service but failed
 Transmic 1G NPC designated as SYNC source invalid

A4 Both syncs are in-service
 Firmware timing invalid for Transmic 1G NPC
 Illegal BRD SYM combination
 NPC is not a NPCTG
 The MXR diagnostics failed

A5 (Timing Distributor) TLI is not equipped
 AIS keyword incompatible with NPC type
 Autonomous loopback is active on DGA
 FPI on SMEM does not match one on PMEM
 Illegal BBL SYM combination
 Test group is not idle or frame is not In Service

A6 Deny SLC for Alternate maps
 Illegal SYM BBL combination
 Invalid switch request for DCLU
 Test group release failed
 The MIU diagnostics failed

A7 Deny non-channelized NPCs for Alternate Maps
 LEG mode was assigned to a DSPU-type NPC on the input
 NPC has been designated as NPCTP
 Sync 0 is not in-service
 The MIU boot failed

A8 A DMB mode was assigned to a FTU-type NPC on the input
 NPCTG not grown
 Sync 1 is not in-service
 The MMFG is Out Of Service

A9 Both syncs are out-of-service
 Circuits TCONed itself cannot be UTST
 Cross-connect not consistent with feature package
 INCL not specified and at least one NPC In Service
 No unmapped time slot
 Trying to add a BBL to a DMB conference that already has one

AA DSPP pack UC Failed or Out of Service
 NPC is NPCTG, changing to CAS/NSA is not allowed
 Range entered without FRC keyword
 Syncs are equipped

Trying to add a broadcast leg to a conference set up as SYM
AB Bad sync mode
 DSPP pack FTMI Failed or Out of Service
 FRC specified for protection, and service MMFG is In Service

Trying to add a SYM leg to conference set up as broadcast
AC DSPP pack NPC Failed or Out of Service
 No protection is available for the Service MMFG

cc *Explanation*

- Timing Extractor type TLI (need SSP info)
Trying to add a BBL leg to a conference set up as SYM
- AD** Not Timing Extractor type TLI (not SSP)
The Protection MMFG is selected, and auto. switchback is unavailable
- AE** A substrate circuit pack is specified in the command line
MXR is failed
NPC used as a timing reference
Wrong TLI type (need CRO grow command)
- AF** 3 Timing Distributor type TLIs are equipped
Delete or change a leg from a conference that has no leg
MIU is failed
Number of SLC RT's on each unit is limited to 80
- B0** Bad use of INCL, cannot override the current state of the conference
Combination of bit g (b7) and h (b8) is invalid
FLI is out of service
Unit 1 denied request
- B1** Bad use of INCL, cannot use keyword on conf.-to-conf. connection
FMT is out of service
Illegal priority value
Unit 2 denied request
- B2** Illegal SSP type (not same as other SSPs)
MXR is out of service
Transmission parameters in command will not change existing settings
Unit 3 denied request
- B3** MIU is already in service
Trying to change level out on BRD leg
Unit 4 denied request
X option is illegal
- B4** NPC is channelized type
Trying to change level in on BBL leg
Unit 5 denied request
Y option is illegal
- B5** CPR circuit pack specified in the command
NPC is a test port
Unit 6 denied request
Z option is illegal
- B6** C-bit operations are enabled
Sync architecture is same
TO side is not a DMB type NPC
The MXR boot failed
- B7** Cannot perform DMB CHG on input direction F
No DSP unit equipped
Some TLIs are still equipped
The associated MXR is In-Service but pested
- B8** CRO is still equipped
Cannot perform DMB CHG on input direction T
No CBTYPE NPC equipped

cc *Explanation*

- B9** Cannot perform DMB CHG on input direction B
No CBTYPE NPC capacity remaining
Timing Extractor type TLIs are present
- BA** Inactive side NPC out of service and inactive side in service
TLI 3 or 4 still equipped
- BB** Timeslot channel numbering not allowed with CAS
- BC** DGA and DGB must be specified together in the command
SSP with 0 priority present
- BD** DGC and DGD must be specified together in the command
Looped Circuit Access not allowed
SSP with non 0 priority present
- BE** Hardware mismatch or not present
NPC type option Y is invalid for SLC-96 NPC
- BF** MIU is not equipped
Sync mode is same
- C0** Cannot perform DMB CHG on input direction L
NPC addressing scheme selected is not allowed in the configuration file
Sync stratum is same
- C1** Cannot perform DMB CHG on input direction G
Stratum not allowed
- C2** Cannot perform DMB CHG on input direction A
ETSI cannot be initialized when ECCN side is OOS or inservice but pested
SSP type(options) same
- C3** Can't perform DMB CHG because NTR flag set on FROM side
Wrong SSP type(Timing Extractor type)
XMIT continuity test won't be run: CFT code specified
- C4** Can't perform DMB CHG because NTR flag set on TO side
Sync architecture different
XMIT continuity test won't be run: no XMIT timeslots available
- C5** Option NOT leg can not appear with F, T, or B
RCV continuity test won't be run: no available inservice NPCS for FC/FMT
Some priority values required
- C6** No available timeslots on any of the inservice NPCS associated with FC/FMT
Option NOT leg is not a FTU leg
Some priority values not required
- C7** Option NOT leg is not in conference
Priority values are same
RCV continuity test won't be run: no DMB timeslots available
- C8** Exceeded depth limit of 6 on broadcast conference concatenation
RCV continuity test won't be run: at least one timeslot in use
Sync pack denied command
- C9** CATP due to skipping continuity test for FMT
In-service NPC change not allowed
Syncs failed to cross couple
The INCL keyword is needed for DGA
- CA** Connectivity can not be specified for CEF unit
Mate sync pack denied command

cc *Explanation*

- New NPC same as existing one
- No protection switch is currently active
- CB** NPC parameter only valid with TU type TLI
- Protection entity out of service or failed
- Skip error summary since adjacent pack not in service or pested
- Sync not completely reset
- CC** NPC is still provisioned to provide sync timing
- Protection entity is unequipped
- RCV continuity test won't be run: SYNC OOS or pested
- CD** Data link failed
- NPC not designated as sync timing source
- Subject NPC does not support CEPT BER feature
- CE** CCI is out of service
- Far end failed to respond
- NPC already allocated as sync timing source
- CF** MIU is out of service
- NPC already grown as non-synchronization source
- SYNC is inservice but failed
- D0** Command is Frame administrator (DAX) only.
- FROM NPC is not provisioned as DGA
- D1** CCI is not present
- Cannot create any more users
- Protection switch existing is autonomous
- TO NPC is not provisioned as DGA
- D2** ETSI is not present
- Protection switching is already inhibited
- User has been created
- D3** CCNI is inservice but failed
- Corresponding NPC for FROM virtual channel is not provisioned
- Protection switching is already allowed
- User does not exist
- D4** A user is already logged in on the link/vc
- Active CCN side is out of service
- CCI is inservice but failed
- Corresponding NPC for TO virtual channel is not provisioned
- D5** Boot in progress, can't service request
- CCB is not equipped
- No user is logged in on the link/vc
- D6** CCB is out of service
- Incorrect or missing password
- Invalid FROM channel number
- D7** CCB is inservice but failed
- Cannot execute privileged command
- Invalid TO channel number
- D8** Cannot remove Frame administrator
- ETSI is not equipped
- D9** ETSI is out of service

cc *Explanation*

- Invalid FROM channel number range
- User has logged in somewhere
- DA** ETSI is inservice but failed
- Invalid TO channel number range
- User is not logged in
- DB** FC is inservice but failed
- User still owns files
- DC** A loopback is active on the FROM termination
- No zeros allowed for DAX privilege
- DD** A loopback is active on the TO termination
- FMT is in service but failed
- Password recovery card is not READ-only
- DF** Command and protocol are inconsistent
- FLI is inservice but failed
- Unmatched channel range
- E0** Bad FAC value entered
- ETSI not equipped, not in service, or failed
- Hardware database mismatch
- Unmatched channel range involving SLC Mode III termination
- E1** A locally switched channel is specified as BBL, LEG, or BRD
- No Memory Backup Has Been Scheduled
- Virtual circuit is not specified for X.25 link
- E2** Attempt to one way cross-connect a locally switched channel
- Invalid link number specified
- E3** Attempt to broadcast a locally switched channel
- Can't Use LCN 0/LGN 0 - designated as a supervisory channel only
- Invalid keyword(s) combination specified
- One way unassigned channel/NPC in QRY,TO
- E4** Broadcast unassigned channel/NPC in QRY,TO
- Invalid NPC addressing scheme specified
- NPC already has Equipment Loopback
- RT-DCLU cross-connect with different ids
- E5** Adding DL DGP forbidden for SLC 96 MD 1
- Invalid combination of "x" and "z" values
- No user/link needs to be changed
- RT-DCLU cross-connect with different channel number
- E6** Cross-connect a non Mode I channel to DCLU
- DB SMEM error OP-CL-RD-WR-SK
- No DL digroups can be added until the associated RT bank is created
- E7** Cross-connect a non SLC channel to DCLU
- Invalid combination of "x" and "y" values
- PMEM not restored
- E8** Other FLI is OOS
- SC invalid for cross-connection specified
- E9** MUX or TRB invalid for cross-connection specified
- There are no INS MXRs to run test on
- EA** AIS invalid for cross-connection specified

cc *Explanation*

- XON/XOFF flow control is supported only on Snider link
- EB** ENQ/ACK flow control is supported only on Snider link
NAM invalid for cross-connection specified
- EC** Invalid channel 000 cross-connection specified
- ED** Invalid channel 031 cross-connection specified
OLD termination is not mapped
- EE** Trunk type is not allowed in the circuit specified
- EF** Invalid circuit type
SSC circuit pack is still equipped; pull-out/remove SSC
Software does not contain Enhanced CEPT feature
- F0** Clock absent for XPC to loop back
Range not allowed for circuit type
SSC Diagnostic Failure
- F1** File has already been cleared
PMEM and SMEM synchronization fail
Parameter only valid with PA, PB, or PC type NPCs
- F2** Invalid NPC number specified
Not a DACS II compatible Flash Card
- F3** Flash Card is empty
Maximum number of CPRs have already been grown for this unit
- F4** OLD and NEW channels cannot be the same
PMEM and SMEM are different
- F5** Conference first channel doesn't match input
Flash Card is not present
INCL keyword needed to perform this command
- F6** Flash Card is bad
Leg type mismatch
T1DM or DMI mode and channel 24 is connected
- F7** Can't mount or unmount old_tape
Corresponding NPC for virtual channel is not provisioned
OLD data channel cannot be parity channel type
- F8** OLD and NEW Data and Parity channels partially overlap
Old_tape is not present
- F9** Cannot clear journals for OOS unit
Mate NPC (DGA/DGP) is in service
Old_tape unit is not restored
- FA** Bad old_tape DB generic
SSC software out of date
The mode of the RT is not applicable
- FB** Old_tape with journal
PMEM verification failed
- FC** Invalid executable on card
Superuser logged on
ZBTSI option is only valid with the ESF mode
- FD** Command not allowed
Line Loop Back is active
NPC range crosses unit boundary

cc *Explanation*

- Problem occurred while accessing old_tape
- FE** AIS entered for MONE/MONF/MONEF/SPLTA/SPLTB/SPLTAB
Change to non-ESF digroup with 16-state cross-connect
Fail transfer DB from old_tape to SMEM
- FF** Change to T1DM digroup with cross-connect that is not TRSP
DB retrofit fail
Termination is in process of being rolled

cccc *Explanation*

- 0000** No conditions
- 0001** CEC bit on PRISM not cleared
- 0002** Firmware error
- 0003** Transmit underrun threshold exceeded
- 0004** Bad EMXR Acknowledgement
- 0005** Timeout while waiting for msg from EMXR
- 0006** RAM data error
- 0007** Invalid code checksum
- 0008** Error in PRISM register
- 0009** Error in HSCC register
- 000A** EPROM checksum error
- 000B** Timer 1 error
- 000C** Timer 2 error
- 000D** DUART error
- 000E** MIU access error
- 000F** CPU internal bus error
- 0010** CPU parallel bus parity error
- 0011** CPU serial bus parity error
- 0012** FLI register bit stuck
- 0013** FLI lock and key alarm
- 0014** MXR DS3 loss of signal
- 0015** MXR unknown error
- 0020** BX Access Error
- 0021** BX Ram Parity Over Low Byte
- 0022** BX Ram Parity Over High Byte
- 0023** Fan Bank Zero Error Flag
- 0024** D5 Spare Bit Error
- 0025** Fan Bank One Error Flag
- 0026** D7 Spare Bit Error
- 0027** BX stuck summary bit
- 0028** Unknown interrupt from BX
- 0029** Error from side 0 bus extension
- 002A** Error from side 1 bus extension
- 002B** Unknown interrupt from MTC
- 002C** MTC stuck summary bit
- 002D** Unused bits on MTC pack

cccc	<i>Explanation</i>
002E	Error due to unused bit
002F	Error due unknown reasons
0030	Power Failure
0031	Sanity Time-out
0032	BX stuck CCNI summary bit
0033	FMT TF control bus error
0034	MXR M23 summary stuck error
0035	FMT multiple TF network data error
0036	FMT single TF network data error
0037	FMT TF device or clock receiver error
0038	FMT multiple TF clock error
0039	FMT single TF sync error
003A	FMT multiple TF sync error
003B	FLI access error
003C	FLI communication link error
003D	DPC ROM error
003E	DPC loss of timing
003F	OOS RAM test ran while IS
0040	Bus Error Alarm
0041	CIA Device Error
0042	CIB Device Error
0043	CIC Device Error
0044	Pack can't be accessed
0045	Loss of timing alarm
0046	Chip ID Comparison
0047	Data Strobe Signal
0048	Address Parity Error
0049	FC Stuck Bit on FTMI
004A	DDC Stuck Bit on FTMI
004B	FTMI lost clock
004C	FC can't be accessed
004D	Timer Error
004E	Circuit ID Error
004F	Transmit Formatter Error
0050	Receiver Formatter Error
0051	Sanity Timer Interrupt
0052	RF bus error
0053	NPC bus error
0054	NPC can not be accessed
0055	NPC is alarming on FC
0056	Facility Processor Sanity Error
0057	SYNC Error
0058	Channel controller loss of clock
0059	Channel controller frame sync error
005A	CC configuration register error
005B	CC instruction ram error
005C	CC parity error

cccc	<i>Explanation</i>
005D	CC transmit data error
005E	CC receiver data error
005F	CC exercise error
0060	CC summary bit error
0061	Hard RAM error
0062	Hard ROM check error
0063	Hard Error stuck bit
0064	Transceiver A stuck bit
0065	Transceiver A transmit slip
0066	Transceiver A Error
0067	Transceiver B stuck bit
0068	Transceiver B transmit slip
0069	Transceiver B Error
006A	Circuit ID Error
006B	Facility errors
006C	NPC address parity error
006D	DSPI access error (e.g. pack not there)
006E	DSPI bus data parity error
006F	DSPI bus address parity error
0070	DMB access error (e.g. pack not there)
0071	DMB serial access error (pack not there)
0072	DMB parallel access error
0073	DMB bits stuck in exercise register
0074	DMB data processing error
0075	Multiple data parity error, CCB problem
0076	DMB clock error
0077	Multiple clock errors, CCB/SYNC problem
0078	DMB FIFO error
0079	Possible power failure on side
007A	DMB control memory error 0 (used for trans)
007B	DMB control memory error 1 (used for trans)
007C	Control Memory 0 control ram parity error
007D	Control Memory 1 control ram parity error
007E	Control Memory 0 control interface error
007F	Control Memory 1 control interface error
0080	Control Memory 0 loss of sync error
0081	Control Memory 1 loss of sync error
0082	Control Memory 0 DMB input data parity error
0083	Control Memory 1 DMB input data parity error
0084	DMB conference error 0 (used for trans)
0085	DMB conference error 1 (used for trans)
0086	Conference 0 control interface error
0087	Conference 1 control interface error
0088	Conference 0 control ram parity error
0089	Conference 1 control ram parity error
008A	Conference 0 DMB input data parity error
008B	Conference 1 DMB input data parity error

cccc	<i>Explanation</i>
008C	Conference 0 DMB device (chip) error
008D	Conference 1 DMB device (chip) error
008E	Bad Ram Data in DMB device (bits alarms)
008F	Bad Ram Data in DMB device (bits alarms)
0090	CCNI access error (cannot access pack)
0091	High data byte bus parity error
0092	Low data byte bus parity error
0093	Address bus parity error
0094	Autonomous switch enable error
0095	Bus status register parity error
0096	CCNI stuck register bit, summary set, no other alarms
0097	MXR communication link error
0098	CPR serial access error
0099	CPR clock error
009A	CPR processor interface failure
009B	CPR input data interface error
009C	CPR D-Bit interface parity error
009D	CPR control memory failure
009E	CPR control memory or state machine failure
009F	CPR FIFO FRDY/FFULL stuck bit
00A0	CCB packid error, wrong pack, can't read pack
00A1	CCB sync pulse error
00A2	CCB clock error
00A3	CCB input port alarm error
00A4	CCB zero bit is stuck at 1
00A5	Corresponding CCNI bit is stuck
00A6	MXR channel controller transmit data error
00A7	MXR channel controller receiver data error
00A8	MXR channel controller exercise error
00A9	MXR channel controller stuck bit error
00AA	MXR transceiver framer error
00AB	MXR transceiver receive sync error
00AC	MXR transceiver transmitter error
00AD	MXR M23 device error
00AE	MXR M12 device error
00AF	MXR M12 summary stuck error
00B0	Pack id error, can't read pack
00B1	TSI stuck bit, summary bit set, no devices alarming
00B2	TSI device error
00B3	TSI device id error, cannot read device
00B4	Illegal exercise bits set
00B5	Bus address error
00B6	Device clock error
00B7	Device control ram parity error
00B8	Output data parity error (from an FTM)
00B9	Corresponding CCNI bit is stuck
00BA	FLI loss of clock

cccc	<i>Explanation</i>
00BB	FLI loss of signal
00BC	FLI circuit id error
00BD	FLI frame sync or internal error
00BE	FLI address bus parity error
00BF	MJU serial access error
00C0	MJU clock error
00C1	MJU processor interface failure
00C2	MJU input data interface failure
00C3	MJU error correction circuitry failure
00C4	MJU control memory failure
00C5	MJU output block failure
00C6	MJU sampling circuitry failure
00C7	MJU control memory or state machine failure
00C8	SRM serial access error
00C9	SRM clock error
00CA	SRM processor interface failure
00CB	SRM input data interface failure
00CC	SRM error correction block failure
00CD	SRM control memory failure
00CE	SRM multiplexor block failure
00CF	SRM output block failure
00D0	CPU RAM Parity error
00D1	Source of error is unknown
00D2	Source of error was not found
00D3	Stuck bit in register
00D4	Bad UBX pack
00D5	Illegal/unknown condition code
00D6	MIU communication link error
00D7	FMT communication link error
00D8	MXR ROM error
00D9	MXR LCA error
00DA	MXR queue overflow
00DB	MXR channel controller loss of clock
00DC	MXR channel controller frame sync error
00DD	MXR channel controller configuration register error
00DE	MXR channel controller instruction ram error
00DF	MXR channel controller parity error
00E0	Hardware database mismatch
00E1	Hardware Failure
00E2	Hardware Boot Failed
00E3	Can't access link
00E4	Transmit Time-out
00E5	Receiver Time-out
00E6	softerr failure which forces link removal
00E7	Unit could not be reset
00E8	Unit failed sanity check
00E9	failure to insert TCC

cccc	<i>Explanation</i>
00EA	failure to remove TCC
00EB	failed to switch CCN sides
00EC	NPC's facility queue overflow condition
00ED	Duplex entity failed diagnostics
00EE	Lost Clear-To-Send signal on X.25 links
00EF	Frame Audit reboot DDC failure
00F0	FMT access error
00F1	FMT timing error
00F2	FMT link id error
00F3	FMT bus timeout
00F4	FMT serial address parity error
00F5	FMT 0-4TF timing error
00F6	FMT 0-4TF timing error
00F7	FMT error summary 1 stuck bit
00F8	FMT timing error, RF data parity
00F9	FMT error summary 2 stuck bit
00FA	FMT lock override, active select or kill parity
00FB	FMT FIFO or control PROM error
00FC	FMT RF control bus error
00FD	FMT RF port and monitor alarms
00FE	FMT RF port alarm; no monitor alarms
0101	CCI pack is not present
0102	Can't communicate to CCI pack(incorrect version number)
0103	CCI pack's summary is set but has no errors
0104	CCIERR bit is stuck in system status reg
0105	TSIERR bit is stuck in system status reg
0106	PUERR bit is stuck in system status reg
0107	Bus Terminator pack is not present
0108	The 32 MHz clock is out of lock
0109	CCI 240 sync is misaligned with frame sync
010A	CCI loss of 240 Frame Sync
010B	CCI loss of 8 KHz Frame Sync
010C	CCI detected Address Parity error
010D	CCI detected low byte data parity error
010E	CCI detected high byte data parity error
010F	CCI -5.2 power supply has failed
0110	CCI detected Bus Status Parity error
0111	CCI Peripheral Unit Alarm
0112	SYNC summary is set on CCI circuit pack
0120	ETSI pack is not present
0121	Can't communicate to ETSI pack (incorrect version number)
0122	ETSI pack's summary is set on CCI but has no errors
0123	ETSI loss of 32.768 MHz clock
0124	ETSI loss of 240 frame sync
0125	ETSI Rcv MDX summary stuck bit
0126	ETSI control RAM summary stuck bit
0127	ETSI TX MDX summary stuck bit

cccc	<i>Explanation</i>
0128	ETSI loss of Vdd (3.3v) power
0129	Peripheral unit port alarm (RCV MDX)
012A	Receive MDX data source time slot parity error
012B	Receive MDX sync error
012C	Receive MDX address parity error
012D	Receive MDX write data parity error
012F	Receive MDX can't be accessed (incorrect chip Id)
0130	Transmit MDX data parity error
0131	Transmit MDX data source time slot parity error
0132	Transmit MDX sync error
0133	Transmit MDX address parity error
0134	Transmit MDX write data parity error
0135	Transmit MDX can't be accessed (incorrect chip Id)
0137	Control RAM parity error
0138	Control RAM sync alarm
0139	Control RAM port alarm
013A	Control RAM BIST flag is set
013B	Data RAM BIST flag is set
013C	Control RAM address parity error
013D	Control RAM write data parity error
013E	Control RAM device can't be accessed (incorrect chip Id)
013F	Control RAM circuit pack parity
0140	Control RAM device is in reset state
0141	Control RAM port alarm summary is stuck
0142	ETSI TRD3ST exercise bit is set
0143	ETSI ready high error on CCI
0144	ETSI ready time-out error on CCI(ETSI can't be accessed)
0145	Control RAM stuck bit error
016D	Invalid FPA state
016E	Invalid DDC pack id
01E1	MXR access error (can't access pack)
01E2	MXR hard error stuck bit
01E3	MXR facility error stuck bit
01E4	MXR pack is in reset state
01E5	MXR PIF Bus Parity Error
01E6	MXR loss of clock from unselected FLI
01E7	MXR 45MHz is not phase locked to system clock
01E8	MXR firmware error
01E9	MXR HSCC device error
01EA	MXR PIF I/O device error
01EB	MXR M13 summary stuck bit error
01EC	MXR transceiver summary stuck bit error
01ED	MXR program error
01EF	MXR RAM error
01F0	EMXR Timer error
01F1	EMXR DUART error
01F2	MIU got reset

cccc	<i>Explanation</i>
01F3	Timeout for Yellow Inhibit/Enable Request
01F4	Queue overflow error
01F5	Packet layer parameters are mismatched between DACS II and the network
01F6	Failed to write XPC register
01F7	Transmit time-out because Clear To Send lost
01F8	R20 counter reaches limit
01F9	T3 timer expires
01FA	Too many interrupts or illegal interrupt from XPC
E000	CCNI summary bit set; no more info
E001	Sync says its down
E002	Sync says its time base is down
E003	SYNC autonomously restarted itself
E004	MP-SYNC communications failure
E100	Unknown DPLL error
E101	ROM checksum error
E102	RAM data error, RAM address line stuck
E103	Phase/frequency output latch error
E104	Loss of energy on output of frequency synth.
E105	Loss of energy on output of phase shifter
E106	Loss of energy on generated SYNC pulse
E107	Loss of energy on time base strobe signal
E108	Interrupt controller error
E109	Interrupt holding register error
E10A	Uart error
E10B	Control data readable output latch error
E200	Unknown time base error
E201	Time base loss of energy detector
E202	TB i/o err. cant read TB packid or oven monitor
E203	Time base frequency drift
E204	Both syncs time base oven is cold
E205	Time base oven is cold
E300	Unknown PLL error,link went down before reading status
E301	PLL end of range
E302	PLL excessive phase error (125 uSec out of phase)
E303	PLL real time violations
E304	PLL fast start time out
E305	PLL end of range implicating TL
E400	Unknown mate error, link went down before read status
E401	Mate out of service
E402	Mate sync hardware error
E403	Cross couple loss of energy
E404	Cross couple loss of energy
E405	Mate link down
E406	Cross couple real time violation
E407	Cross couple fast lock range
E408	Cross couple frequency offset error
E409	Cross couple out of lock

cccc *Explanation*

E500	TLI error, link went down before status read
E501	TLI hardware error
E600	TL error reported, unknown
E601	TL out of service or loss of signal
E602	Timing Extractor type TLI has hardware problem
E603	Timing Extractor type TLI has autobaud failure
E700	CRO error, unknown due to link, SYNC error
E701	CRO loss of energy detected SYNC error
E702	CRO loss of energy CRO error
E703	CRO frequency offset
E704	CRO declared OOS
E805	TL error cleared
E806	TLI error cleared
EF00	Unknown what sync switched to
EF01	SYNC switched to NORMAL mode
EF02	SYNC switched to HOLDOVER
EF03	SYNC switched to FAST mode
EF04	SYNC switched TLIs/SSPs
EF05	SYNC switched to cross couple

Glossary

A

ABT

Abort

ACO

Alarm Cutoff

Active

For duplicated entities, the entity is providing service rather than operating in hot standby.

AI

Alarm Interface

AIS

Alarm Indication Signal (also known as all 1s signal)

Alarm Delay

The alarm delay (in seconds) for software-detected alarm conditions. Initial value is 20 seconds.

Alarm Indication Signal (AIS)

A signal transmitted downstream to indicate that network transmission line failures were detected upstream.

All Ones Signal

Another name for DS1 Alarm Indication Signal (AIS). It is defined to contain all ones in the terminal-to-terminal mode.

ALM

Alarm

Alphanumeric Characters

Letters and digits.

Alternate Mark Inversion (AMI)

A DS1 line code in which alternate one bits are positive and negative, but zero substitution is not used.

AMI

Alternate Mark Inversion

ANSI

American National Standards Institute

AS&C

Alarm Surveillance and Control

ASCII Character

Letters, digits, and symbols used in the American Standard Code for Information Interchange.

ATAG

Autonomous Message Tag

ATP

All Tests Passed

Attribute

Alarm indication level: major, minor, or no alarm.

AUD

Audit

Autolock

When the system autolocks an entity, it switches to protection and forbids return to the working entity even if the trouble clears. This is usually caused by multiple protection switches on that entity in a short time period.

Autolock Number of Switches

This parameter is the number of times that the system restores an entity to service (after intermittent failures) in a given autolock switching interval before the entity is autolocked.

Autolock Release Time

The number of hours between times when the system automatically releases autolock.

Autolock Switching Interval

An interval in minutes (see Autolock Number of Switches).

Autonomous

Done automatically by the system without any manual intervention from the user.

Autoprovisioned

Put in the provisioned state automatically by the system.

B

B3Zs

Bipolar with 3-zero substitution, a DS3 line code.

B8ZS

Bipolar Eight Zero Substitution

Baud Rate

Transmission data rate (bits per second) on an administrative link.

BBL

Backbone Leg

BC

Bus Controller

BCON

Broadcast Cross-Connect

BDIS

Broadcast Disconnect

BER

Bit Error Rate

BER Metric

Specifies the metric for calculating bit error rate at a DS3 interface port. Options are bipolar variations (BPV) or parity (PTY). (Initial value is BPV).

Bipolar Violation

A violation of the alternating +1, -1 pattern in a 3-level code.

Bit Error Rate Threshold

3 stands for 0.001, 6 stands for 0.000001.

Blue Code

Same as AIS

BMTR

Back-up Memory Transfer

Boot

To transfer contents of a Memory Card into the system's working memory and system hardware. The contents of a Memory Card can include both system software and database.

BOS

Bit Oriented Signaling

BPV

Bipolar Violation

BRD

Broadcast Leg

Broadcast

Form a bridge connection.

BSRF

Basic Synchronization Reference Facility

BT

Bus Terminator

BX

Bus Extender

Byte

Usually refers to a group of eight consecutive binary digits, but sometimes used for bit groups of other sizes.

C

CAS

Channel Associated Signaling

CATP

Conditional All Tests Passed

CBIT

A DS3 line code in which parity checks on blocks of data are used to detect bits in error.

CCB

Cross-Connect Buffer

CCI

Clock and Control Interface

CCIS

Common Channel Interoffice Signaling

CCITT

International Telephone and Telegraph Consultative Committee

CCN

Cross-Connect Network

CCNI

Cross-Connect Network Interface

CEF

Capacity Expansion Frame

CFA

Carrier Failure Alarm

CFR

Synchronizer Configuration

CGA

Carrier Group Alarm

CHG

Change

CI

Communications Interface

CIU

Craft Interface Unit

Clear (CL)

An alarm condition no longer exists.

CLF

Carrier Line Failure

CMAP

Channel Map

COFA

Change-Of-Frame-Alignment

Condition

The type of alarm indication.

CP

Circuit Pack

CPR

C-Bit Processor

CPU

Central Processing Unit

CRC

Cyclic Redundancy Checking

CRO

Clock Reference Oscillator

Cross-Connect

A piece of hardware used to interconnect line-terminating equipment, multiplexers, and other equipment.

Cross-Connection

An interconnection between two specified NPC channels.

Crosstalk

A signal induced into one transmission line from another transmission line.

CRT

Cathode Ray Tube

CSS

Controlled Slip Seconds

CTAG

Correlation Tag

Current Value

In the dialog mode, it indicates that the current value of a parameter is used by the system unless you direct otherwise.

CV

Coding Violations

D

DACS

Digital Access and Cross-Connect System

Database

A record of the system configuration and status. It contains cross-connections, status of entities and transmission lines, performance monitoring threshold values and collected data.

DATS

Digital Access Test Set

DC

Digroup Circuit or Direct Current

DCC

Disconnect Code

DCLU

Digital Carrier Line Unit

DDC

Dual Digroup Circuit

DDS

Digital Data System

Default

A value the system automatically uses for a parameter if you do not specify a value.

Delimiter

A colon, comma, or space used to separate two parameters in a command or message.

Demultiplexer

A device used with a multiplexed signal for recovering signals contained within it and restoring the distinct individual channels of these signals.

DFB

Dual Fuse Board

Diagnose

Test an entity.

DIF

DACS Interface Module

DL

Data Link

DLC

Digital Loop Carrier

DM

Dual Multiplexer

DMA

Deferred Maintenance Alarm

DMAP

Digroup Map

DMB

Digital Multipoint Bridge

DMI

Digital Multiplex Interface

DMM

Digital Multimeter

DOTS

Digital Office Timing Supply

DPC

Dual Primary Circuit

DPLL

Digital-Phase Locked Loop

Driven

A driven port is being monitored, and a good signal is expected.

DS0

Digital Signal Level 0 (64-kb/s)

DS1

Digital Signal Level 1 (1.544-Mb/s)

DS1 Data Rate

The DS1 Data Rate is calculated as follows:

$DS1 = (24 \text{ Channels} \times 8 \text{ bit/sample} + 1 \text{ frame bit}) \times 8000 \text{ samples/sec}$

$DS1 = 193 \times 8000 = 1.544 \text{ Mb/s}$

DS1 Port

A DS1 port in either a DS1 interface module or a DS3 interface module.

DS3

Digital Signal Level 3

DS3U

DS3 Unit

DSP

Digital Signal Processor

DSPC

Digital Signal Processor Circuit

DSPI

Digital Signal Processor Interface

DSPU

Digital Signal Processor Unit

DSU

Data Service Unit

DSX

Digital Signal Cross-Connect

DTAC

Digital Test Access Connector

Duplex Entity

A pair of entities in which one is active and the other is in hot standby (clock generators).

Duplicated Entity

A pair of entities in which one is active and the other is in hot standby (for example, the Synchronizer Cross-Connect (SXC) circuit packs).

E

E1 Data Rate

The E1 Data Rate is calculated as follows:

$E1 = (32 \text{ Channels} \times 8 \text{ bit/sample}) \times 8000 \text{ samples/sec}$

$E1 = 256 \times 8000 = 2.048 \text{ Mb/s}$

 NOTE:

With this data rate, 30 channels carry traffic and two channels are reserved; one channel contains framing information and the other channel contains signaling information.

E2A

Type of Alarm Telemetry

EBX

Expanded Bus Extender

ECCN

Expanded Cross-Connect Network

Echo

Display of keystrokes entered from a terminal (passwords are not echoed).

ECI

Enhanced Communications Interface

EDDC

Enhanced Dual Digroup Circuit

EDPC

Enhanced Dual Primary Circuit

EER

Excessive Error Rate

EFC

Extended Frame Controller

EIA

Electronic Industries Association

EID

Entity Identification

EMC

Electromagnetic Compatibility

EMIU

Expanded Multiple Interface Unit

EMTC

Expanded Maintenance Circuit

Enter

Provision an entity by a command, not automatically by the system.

Entity

A specific piece of hardware (such as the Main Controller (MC) or Network Processing Circuit (NPC)) that has been assigned a name and is recognized by the system.

Entity Identifier

The name used by the system to refer to an entity.

Equalizer

A circuit adjustment used to maintain signal strength between desired limits.

Equipped

The entity is entered in the system database via a user provisioning command.

ER

Error Rate

ERS

Errored Seconds

ES

Errored Seconds

ESD

Electrostatic Discharge

ESF

Extended Superframe

ESR

Error Source Register

ESR1

Error Source Register 1

ESR2

Error Source Register 2

ETSI

European Telecommunication Standardization Institute

F

FAL

Fuse Alarm Lamp

FAS

Frame Alignment Signal

FC

Format Converter

FDL

Facility Data Link

Fe

Extended Superframe Format

FEBE

Far-End Block Error

FELP

Far End Loopback

FES

Far-End Errored Seconds

FLI

Facility-Line Interface

FMAC

Facility Maintenance and Administration Center

FMT

Formatter

Forced

A traffic-carrying entity (either service or protection) has been deliberately locked into a service providing state by manual command despite being bad.

FPA

Feature Package A

FPB

Feature Package B

FPC

Feature Package C

FRADT

Frame Audit

FRER

Framing Bit Error

Fs

Fx Framing Format

FSES

Far-End Severely Errored Seconds

FTM

Facility Terminating Module

FTU

Facility Terminating Unit

FUAS

Far-End Unavailable Seconds"

FW

Framing Word



G

Grooming

Rearrangement of DS1 signals in DS3 signals.



H

HDB3

High Density Bipolar 3 Zero Substitution

HDS3U

DS3 Hybrid Unit.

Header

The first line of a message.

Header Date

Specifies the current date as YYMMDD, where YY is the last two digits of the year, MM is the month, and DD is the day of the month.

Header Time

Specifies the current time of day as HHMMSS, where HH is the hour (00 to 23), MM is the minutes, and SS is the seconds.

HECI

High-Speed Enhanced Communications Interface

HFMT

Hybrid Formatter.

Hierarchy

An orderly ranking or sequence of elements, such as that of menus presented at a terminal.

Hit

A disruption of service that lasts for less than 1 second. See Outage.

HMXR

Hybrid Multiplexer.

Hot Standby

An entity ready for fast, automatic placement into operation to replace an active entity.

HUBID

Hub Identifier

I

ICLD

Idled

Idle

An output port is idle if it is not cross-connected to an input port.

Idle Channel

A channel on an NPC that has not been cross-connected.

IFTU

Integrated Facility Terminating Unit

In Service

The entity is performing normal service functions, either active or standby.

ISX

Integral Shelf Cross-Connect

ITU-TSS

International Telecommunication Union-Telecommunication Standardization Sector

J

Jitter

Short term variations in the phase of a digital signal.

K

kb/s or kbit/s

Kilobit Per Second

kHz

Kilohertz

L

LAN

Local Area Network

LBO

Line Build-Out

LED

Light-Emitting Diode

LFA

Loss of Frame Alignment

LILB

Line Interface Loopback

Link ID

The location and type of a user interface link.

LLB

Line Loopback

LMA

Loss of Multiframe Alignment

Location

The specific entity involved.

Loopback

A circuit arrangement that causes a received signal to be returned to its source.

LOS

Loss of Signal

M

M13

A standard format used for DS3 signals

Maintenance

The entity has been locked into a non-service providing state by a manual command.

Maintenance Condition (MCOND)

MCOND is a condition in which the Main Controller (MC) is isolated from system hardware in order for the user to perform memory transfer operations. Placing the MC in MCOND is non-service affecting. When the MC is in the MCOND service state, the system software and database are not transferred to the Memory Cards. The Maintenance Condition enables the user to transfer database and/or system software among the Memory Cards and the MC's Random Access Memory (RAM) in a controlled manner via user commands. The MCOND service state is also used to perform system software upgrades.

Mapped

Cross-connected.

Mb

Megabit

Mb/s or Mbit/s

Megabit Per Second

MBER

Minor Bit Error Rate

MC

Main Controller

MCOND

Maintenance Condition

MCP

Main Controller Peripheral

MEMA

Memory Card Slot A

MEMB

Memory Card Slot B

Memory Location

Specifies the equipment, DS1 interface port, or DS3 MUX port location associated with a memory type.

MER

Multiframe Error

MI

Maintenance Information

MIU

Multipoint Interface Unit

MJU

Multipoint Junction Unit

MMFG

Multiplexer-MIU Functional Group or HMXR-MIU Functional Group

MML

HuMan-Machine Language

MP

Main Processor

MPDIS

Multipoint Disconnect

MPM

Multipoint Mode

MTC

Maintenance Circuit

MXR

Multiplexer

N

NA

No acknowledgement

NDL

No Data Link

NEBS

Network Equipment Building Systems

Network Element

A DACS II ISX system is a network element.

NFW

Not Framing Word

NG

No Good

NOBBL

No Backbone Leg

Notification Code

The notification code for alarm and status conditions, which include: MJ - major alarm; MN - minor alarm.

NPC

Network Processing Circuit

NPCTG

Network Processing Circuit Test Group

NPCTP

Network Processing Circuit Test Port

NSA

Nonsignaling Associated

NZCS

No Zero Code Suppression

O

OA&M

Operation, Administration and Maintenance

OCNT

One-Way Cross-Connect, Terminated

ODIS

One-Way Disconnect

OFS

Out-Of-Frame Seconds

OCON

One-Way Cross-Connect

OOS

See Out-of-service.

OS

Operations System

Out Of Service (OOS)

The entity is not providing its normal service function (removed from service) either because of a system problem or because it has been removed from service manually.

Outage

A disruption of service that lasts for more than one second. See Hit.

P

Parity Check

To determine whether a block of digital data has been corrupted in transmission, you can use an even-parity format in which an extra bit is added to the block at the transmitter if necessary so that the block always contain an even number of one bits. A parity-checking circuit at the receiving end can determine whether an error has occurred in transmission. An odd-parity format can also be used for the same purpose.

PBA

Primary Block Alarm

PBC

Primary Block Circuit

PBF

Primary Block Failure

PBX

Private Branch Exchange

PCM

Pulse Code Modulation

PCMCIA

Personal Computer Memory Card International Association

PDS

Program Documentation Standards (Language)

PF

Printout Follows

PFW

Pseudo-Frame Word

PLL

Phase-Locked Loop

PMA

Prompt Maintenance Alarm

PNI

Packet Network Interface

POTS

Plain Old Telephone Service

Primary Line

The second line in an output message.

Program

The software that directs the operation of the main controller and other frame elements.

Protocol

Detailed format and procedures used for transmitting digital data.

Protocol Type

Indicates the protocol supported on the interface link.

Provisioned

The entity has been configured by the user and entered into the system database and is ready to be restored to service.

PU

Power Unit

Pulse Code Modulation (PCM)

The process by which analog signals are sampled, quantized, and coded into a digital bit stream.

PVC

Permanent Virtual Circuit

R

R16

Remote Alarm Indication in TS16

RAI

Remote Alarm Indication

RAIS

Remote Alarm Indication Signal

RAM

Random Access Memory

RBER

Remote Bit Error Rate

RDC

Red Circuit

REER

Remote Bit Error

Released

If an input port, it is not under test access; if an output port, it is not cross-connected to an input port under test access.

RL

Retry later

RMS-D

Remote Measurement System - Digital

RMS-I

Remote Measurement System - International

Rollover

Operation used when the transmission facility between the system and an upstream system is to be replaced.

RT

Remote Terminal

RTS

Remote Test System

RTS-5A

Remote Test System 5a

S

SAP

Status and Alarm Panel

SARTS

Switched Access Remote Test System

SCC

Subrate Cross-Connect

SCCSAI

Switching Control Center System Asynchronous Interface"

SECH

Subrate Establish Command

SERS

Severely Errored Seconds

SID

Source Identifier

SNIDER

Protocol (message format) used on asynchronous administrative links.

Software ID

Gives the software version information for a system: g - is a one-digit number giving the software release; i - is a two-digit number giving the issue; r - is a one-digit number giving the point release.

SPU

Synchronizer Power Unit

SRM

Subrate Multiplexer

SSC

Secondary Storage Controller

SSP

Select Synchronization Port

Standby

Entity is one of a duplicated pair, but not providing service. It is ready to be used to replace a similar entity either by protection or by duplex switching.

State

The state of an entity indicates whether it is defective or normal, whether it is ready for normal use, etc.

Subrate

In the digital data system, a data bit rate that is either 2.4, 4.8, or 9.6 kb/s.

SVC

Switched Virtual Circuit

SYNC

Synchronizer

Synchronizer Cross Connect

A dual function circuit pack that performs both synchronization and cross-connect functions.

System Executables

The software that directs the operation of the Main Controller (MC) and other system entities.

T

T1DM

T1 Data Multiplexer

TABS

Telemetry Asynchronous Block Signal

TAD

Test Access Digroup

TB

Time Base"

TC

Trunk Conditioning

TCNT

Two-Way Cross-Connection, Terminated

TD

Timing Distributor

TDIS

Two-Way Disconnection

TDM

Time Division Multiplexed

Test Access

A mode of operation that provides full access to the circuit under test but does not interfere with any other cross-connections that have been established.

Test Mode

Specifies the Test Access Mode

TG

Test Group

TID

Target Identifier

TLA

Terminate and Leave Activate

TLI

Timing Link Interface

TLP

Transmission Level Point

TLR

Terminate and Leave Release

TP

Test Port

TPR

Test Port Release

TSI

Time Slot Interchange

TTY

Teletypewriter Terminal

UAC

Unassigned Channel Code

U

UAS

Unavaillable Seconds

UATC

Unavailable Time Count

UBX

Unit Bus Extender

UC

Unit Controller

UMC

Unassigned Multiplexer Code

V

VC

Virtual Circuit

Z

ZBTSI

Zero Byte Time Slot Interchange

ZCS

Zero Code Suppression

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