



**DACS II**  
**Release 9.0, MML**  
**Operations and Maintenance**  
Volume I - Reference Material

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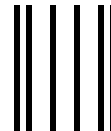
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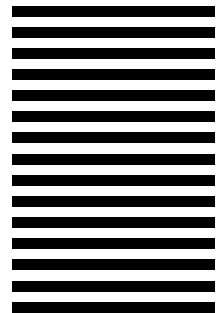
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## About This Manual

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## Background

---

### **Purpose**

The purpose of this manual is to aid in acceptance and operation of the Digital Access and Cross-Connect System II (DACS II).

This document provides reference information required to support the craft personnel activities involved in the daily operation and maintenance of the DACS II. It also includes an overview that describes the physical and functional attributes of the DACS II.

---

### **Intended Audiences**

This document is for individuals who are responsible for the acceptance, provisioning, operation, and maintenance of the DACS II, Release 9.0.

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## New Features in This Release

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### Overview

The new features associated with DACS II Release 9.0 are:

- Threshold support for the Hybrid DS3 circuits
  - The introduction of the Intelligent Communication Interface (ICI) circuit pack.
  - Integrated Test Set (ITS).
- 

### Hybrid DS3 Threshold Support

This feature adds threshold support to the performance monitoring feature for Hybrid DS3 circuits. Users can set up four separate threshold values including the default threshold value for each performance monitoring parameter. When a threshold is crossed, a threshold crossing message is issued. However, with this feature, threshold crossings and their associated alarm messages can be suppressed (turned off).

---

### ICI Circuit Pack

The Intelligent Communication Interface (ICI) circuit pack (TM 782 card) provides the port connections for the seven administrative links:

- Four asynchronous links (links 1 through 4, SNIDER protocol)
- Two synchronous links (links 5 and 6, X.25 protocol)
- One TCP/IP link (link 7, telnet protocol).

The ICI circuit pack replaces the Main Controller's H/ECI circuit pack used prior to Release 9.0, and even plugs into the same slot used for the H/ECI circuit pack. The ICI pack will have all of the existing functionality of the H/ECI pack except the functionality available with the additional TCP/IP link connection.

---

### ITS

The Integrated Test Set (ITS) feature provides the DACS II with a built-in Bit Error Ratio Tester (BERT) capability. The ITS was developed to replace expensive test sets for facility troubleshooting, providing the capability of generating, reading, and evaluating test signals from the DACS II.

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### Non-CEF Information

Release 9.0 does not support Non-CEF frames. However, the Non-CEF information is left in the documentation for reference purposes.

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## How to Use This Manual

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### **Before Using the Procedures**

Before you attempt to use the procedures in this manual, you should become familiar with the contents of each volume.

---

### **Accessing the Information**

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

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

### **Prerequisites**

Before you use the procedures in this document, you should have completed the DACS II Operation and Maintenance course (TR3521 or TR3621).

If you were not able to take the training course, you should carefully study the information in Chapter 1 and the Command Denials located in Appendix A of Volumes I, II, and III.

---

### **Procedure Sequence**

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 the Trouble Identification section in Chapter 1 of Volume III. The sections in this volume 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.

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## Manual Contents

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### Volume Breakdown

This manual is divided into the following three volumes:

- Volume I - Operation and Maintenance Reference Material
- Volume II - Operation and Maintenance General Tasks
- Volume III - Trouble Clearing General Tasks.

The reference information in Volume I supports the General Tasks (procedures) documented in Volumes II and III.

---

### General Tasks and Supporting Elements

The chapters in Volume II and III are divided into General Tasks (GT) and Supporting Elements (SE). GTs are the major tasks performed by users, and SEs are sub-tasks within a GT.

There is a correspondence between the chapter numbers in Volume I and the GTs in Volume II. For example, the general tasks related to reference Chapter 6: Cross-connections and Disconnections begin at GT 6.1. In Volume III, the GTs for a particular type of trouble are grouped together in one chapter.

SEs are associated with a GT and are usually located immediately after the GT. Some SEs are reusable in other GTs in that particular chapter and in the GTs of other chapters. When a GT step requires an SE, the SE will typically be found at the end of the GT. GTs and SEs follow a similar numbering scheme. For example, *SE 5.1.1* indicates the first SE in GT 5.1.

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## Manual Contents (Continued)

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### Contents of Volume I

The contents of *Volume I - Operation and Maintenance Reference Material* are listed below:

■ **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 reference information which describes the acceptance of a DACS II frame after it has been installed.

■ **Chapter 3 - Provisioning**

This chapter contains reference information which describes circuit pack installation and the growing, restoring, removing, and degrowing of the common equipment (NPC, frame, synchronizer, and cross-connect network) and Units (FTU and DSPU).

■ **Chapter 4 - Test Access**

This chapter contains reference information which describes establishing test ports, making the DS0 and Clear-DS1 test connections, and establishing and testing subrate channels.

■ **Chapter 5 - Cross-Connections and Disconnections**

This chapter contains the reference information which describes making DS0, Clear-E1, Channelized-E1, Nx64 and Subrate cross-connections and to disconnect the cross-connections.

■ **Chapter 6 - Administration**

This chapter contains the reference information which describes logging on/off the DACS II; creating, changing, and deleting alternate maps; and creating, activating, and deleting macros.

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## Manual Contents (Continued)

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### Contents of Volume I, Continued

#### ■ Chapter 7 - Maintenance

This chapter contains the reference information which describes routine PMEM and SMEM memory card maintenance, PMEM and SMEM card removal, and plug-in removal and replacement.

#### ■ Chapter 8 - Performance Monitoring

This chapter contains the reference information which describes scheduling and retrieving reports that monitor various DS1 performance parameters.

#### ■ Chapter 9 - C-Bit Processing

This chapter contains the reference information which describes connecting/disconnecting facility channels to C-bit processor and selecting C-bit processing functions.

#### ■ Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume II

The contents of *Volume II - Operation and Maintenance General Tasks* are listed below:

- **Chapter 1 - (Left Intentionally Blank)**

- **Chapter 2 - Acceptance General Tasks**

This chapter contains the procedures to perform the acceptance of a DACS II frame after it has been installed.

- **Chapter 3 - Provisioning General Tasks**

This chapter contains the procedures to install circuit packs and to grow, restore, remove, and degrow the NPCs (FTU with or without *SLC*<sup>®</sup> Carrier, DSPU, Subrate, DMB, or DSP Applications).

Also included are the procedures to make the DSX connections and perform tests to establish DS1 facilities with or without *SLC*<sup>®</sup> Carrier and Subrate channels.

- **Chapter 4 - Test Access General Tasks**

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

- **Chapter 5 - Cross-connections and Disconnections General Tasks**

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

- **Chapter 6 - Administration General Tasks**

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

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## Manual Contents (Continued)

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### Contents of Volume II, Continued

#### ■ Chapter 7 - Maintenance General Tasks

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

#### ■ Chapter 8 - Performance Monitoring General Tasks

This chapter contains the procedures to schedule and retrieve reports that monitor various DS1 performance parameters.

#### ■ Chapter 9 - C-Bit Processing General Tasks

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

#### ■ Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume III

The contents of *Volume III - Trouble Clearing General Tasks* are listed below:

- **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**

This chapter contains procedures for isolating 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**

This chapter contains procedures for isolating a conditional reset or back-up memory trouble.

- **Chapter 8 - Frame Audits**

This chapter contains procedures for isolating faults detected when frame audits are run.

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- **Chapter 9 - Software Error**

This chapter contains procedures for troubles indicated by a software trouble message.

- **Chapter 10 - TS0 and C-Bit Messages**

This chapter contains procedures which instruct 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.

- **Appendix A - Command Denials**

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

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## Manual Conventions

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**Special Font Used** This manual uses special fonts to differentiate computer input/output. The **constant width bold font** indicates message formats, keywords, letter representations of parameters, parameter values, and messages as they would appear on a DACS II terminal screen.

---

**Notes** Notes inform users of special considerations, situations, or items to remember. An example of a Note is shown below:

 **NOTE:**  
Terminated connection for DMB concatenation is not allowed.

---

**Safety Label** Cautions indicate the presence of a hazard that will or can cause a frame alarm or property damage if hazard is not avoided. An example of a Caution is shown below:

 **CAUTION:**  
*The UMC is inserted towards the direction that is terminated, potentially causing a loss of service.*

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## Related Documentation

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### Related DACS II Documents

The following documents support the DACS II:

- DACS II Installation Manual
  - IPH903 (DACS II CEF)
  - IPH903I (DACS II ESBF).

**Audience:** Customers planning to install the equipment

**Content:** Customer installation instructions.

- DACS II Release 7.0 Product Description Manuals:
  - 365-353-085 (24 Channel)
  - 365-353-086 (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 9.0 Operation and Maintenance Manuals:
  - 365-353-261 (PDS)
  - 365-353-271 (MML)
  - 365-353-281 (PDS 2.048-Mb/s Interface)
  - 365-353-291 (MML 2.048-Mb/s Interface).

**Audience:** End-user maintenance personnel

**Contents:** Procedures to operate and maintain the DACS II.

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- DACS II Release 9.0 Command and Message Manuals:

- 365-353-262 (PDS)
- 365-353-272 (MML)
- 365-353-282 (PDS 2.048-Mb/s Interface)
- 365-353-292 (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 9.0 Quick Reference Guides:

- 365-353-263 (PDS)
- 365-353-273 (MML)
- 365-353-283 (PDS 2.048-Mb/s)
- 365-353-293 (MML 2.048-Mb/s).

**Audience:** End-user maintenance personnel

**Content:** Abbreviated list of system commands and parameters.

- DACS II Release 8.2.3 Software Release Description:

- Comcode C108460080

**Audience:** End-user maintenance personnel

**Content:** Includes upgrade procedures for the new software release, status of problems fixed in previous releases, list of known problems, and operating issues for the specified software release.

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- X.50/X.57 Subrate Application  
Release 1.0.3 for DACS II/Release 1.0.4 for DACS II ISX  
MML 2.048 Mbit/s Interface User's Manual

— 365-350-101 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the X.50/X.57 Subrate application on the DACS II or DACS II ISX. Commands and messages describing how to perform subrate cross-connects and subrate test access are included.

- DDS Subrate and MJU Application  
Release 1.0.4 for DACS II/Release 1.0.5 for DACS II ISX  
User's Manual

— 365-350-110 (PDS)

— 365-350-111 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DDS Subrate and MJU application on the DACS II or DACS II ISX. Commands and messages describing how to perform DDS subrate cross-connects, subrate test access, and subrate MJU operations are included.

- Digital Multipoint Bridge (DMB)  
DSP Platform Application  
Release 1.0.2 for DACS II/Release 1.0.3 for DACS II ISX  
User's Manual

— 365-353-144 (PDS)

— 365-353-154 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DMB application on the DACS II or DACS II ISX. Commands and messages describing how to perform DMB cross-connects and DMB test access operations are included.

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# Introduction

# 1

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| Overview                                               | <a href="#"><u>1-138</u></a> |
| Extended Numbering                                     | <a href="#"><u>1-138</u></a> |
| Hierarchical Numbering                                 | <a href="#"><u>1-138</u></a> |
| ■ On-Line Help Feature                                 | <a href="#"><u>1-139</u></a> |
| Description                                            | <a href="#"><u>1-139</u></a> |
| Using                                                  | <a href="#"><u>1-140</u></a> |
| Constructing an Entire Command Using Help              | <a href="#"><u>1-141</u></a> |
| Obtaining Help at a Particular Point on a Command Line | <a href="#"><u>1-144</u></a> |
| <b>Equipment Precautions and Backup Strategies</b>     | <a href="#"><u>1-147</u></a> |
| Overview                                               | <a href="#"><u>1-147</u></a> |
| ■ Equipment Precautions                                | <a href="#"><u>1-147</u></a> |
| Electrical Discharges                                  | <a href="#"><u>1-147</u></a> |
| Removing and Installing Circuit Packs                  | <a href="#"><u>1-148</u></a> |
| ■ Recommended Memory Card Backup Strategy              | <a href="#"><u>1-150</u></a> |
| Memory Card Backups                                    | <a href="#"><u>1-150</u></a> |
| Rotating Memory Cards                                  | <a href="#"><u>1-150</u></a> |
| Off-Site Backup Storage                                | <a href="#"><u>1-150</u></a> |
| Memory Card Tolerations                                | <a href="#"><u>1-150</u></a> |

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## Introduction

# 1

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## Background

### Introduction

The DACS II is software-based equipment. The name Digital Access and Cross-connect System II (DACS II) describes the main function of DACS II. It accesses DS0 information channels in the digital signals connected to it. These digital signals can be 1.544-Mb/s DS1 signals or 44.736-Mb/s DS3 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.

---

### Objectives

This chapter provides information to perform the following:

1. Identify the different DACS II frame types,
  2. Identify the units/subassemblies of each frame
  3. Describe the functions of each unit/subassembly and its associated packs.
  4. Describe the main features of the DACS II
  5. Identify the parts of a DACS II command.
  6. Send a command to the DACS II.
-

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## Background (Continued)

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### DACS II Components

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.

---

### Cross-connect Capacity

When three bays are equipped to terminate 640 DS1 facilities (original interface bays), the DACS II can cross-connect all 15,360 DS0 channels in various cross-connect circuit configurations. If the capacity expansion frame (CEF) is equipped for 2,560 DS1 facilities, the DACS II can cross-connect all 61,440 DS0 channels.

---

### DS0 Channels

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/s bandwidth channels produced by pulse code modulation (PCM).

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### DS3/DS1/DS0 Cross-connections

The cross-connections at the DACS II are done at the DS0 signal level so each incoming DS3 signal is demultiplexed to the constituent DS1s and the DS0 channels. The constituent DS1s are individually monitored for facility performance just like direct DS1 terminations. The DS0 channels can be packed or groomed into other DS1 facilities by cross-connections. A clear DS1 can also be supported on the DS3 unit, thereby providing the functionality of a true DS3/DS1/DS0 system.

---

### Subrate Capacity

When equipped with the subrate feature, DACS II can cross-connect, access for testing, and multiplex subrate (2.4-kb/s, 4.8-kb/s, and 9.6-kb/s) and 56-kb/s digital data channels.

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## Background (Continued)

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### DS3 Feature

The DS3 feature lets the DACS II process North American asynchronous DS3 signals. Up to six DS3 interfaces can terminate on a DS3 unit, and each DS3 interface can be grown as needed. With the modular DS3 unit equipment, the DS3 feature can be economically added for small-scale DS3 terminations, or with the flexible bay, most or all of the frame can be used to provide an alternative vehicle for substantial DS3 terminations.

---

### Hybrid DS3 Feature

The Hybrid DS3 feature expands DACS II system's DS3 capabilities to allow the processing of both Hybrid DS3 and regular DS3 signals. Any of the seven DS2 signals within a Hybrid DS3 signal may carry either three 2.048 Mbit/s (E1) signals or four 1.544 Mbit/s (T1) signals. However, the two signal types (T1 and E1) cannot be mixed within a DS2. The same modular flexibility of the DS3U has been incorporated into the HDS3U. The cross-connections are also performed at the DS0 level, so the demultiplexing and multiplexing of signals is similar to that of the DS3U.

Line loopback is supported for both the E1 and T1 signals within the Hybrid DS3 signal.

When a Hybrid DS3 signal fails, it will trigger the generation of a DS3 alarm message, but there will be no alarm messages for the embedded individual T1 or E1 circuits. This will eliminate a flood of alarm messages. However, the circuits affected by the Hybrid DS3 signal failure will be placed in a CGA or BPA alarm state.

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## Background (Continued)

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**Time Slot  
Interchange**

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 24 DS0 channels (1.544-Mb/s DS1 facility) within the DACS II cross-connect network.

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**Gateway Feature**

The DACS II can be configured for gateway operation. When configured for gateway operation, the DACS II terminates both DSI (1.544 Ms/s) facilities and 2.048 Mb/s facilities. The DS0 channels in each of the facilities can be cross connected.

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## Background (Continued)

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### **SLC® Carrier Feature**

The *SLC*® carrier features provide a direct interface at DACS II for T1 lines from either *SLC* 96 carrier or *SLC* Series 5 carrier remote terminals. The channels from these remote terminal lines are then connected through DACS II to office equipment to provide the *SLC* carrier services. The DACS II provides *SLC* carrier alarm handling and facility protection switching so it can be placed in the route without altering the operation of the other equipment. For *SLC* 96 carrier, the direct interface supports both Modes I and III; for *SLC* Series 5 carrier, the interface supports Feature Package B (FPB) with specials (also referred to as Enhanced Feature Package B) and Feature Package C (FPC) for special services only.

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### **SLC® 96 Carrier Configuration**

For *SLC* 96 carrier Mode I, mixed services (POTS and specials) residing on the same T1 line are brought to DACS II. Special service channels are packed and routed to the network, and the POTS channels are passed through the DACS II to the local digital switch. This interface allows integration of the Mode I systems carrying any number of both POTS and specials. DACS II also supports Mode I systems carrying special services only. DACS II terminates the *SLC* 96 carrier data link, packs the specials onto either DS1 or DS3 facilities, and routes the services to their destination. For the Mode III, the DACS II acts as a replacement for back-to-back COTs (central office terminals) and D-channel banks. The Mode III facilities terminate directly on the DACS II, and the specials are routed to their destination in the network on either DS1 or DS3 facilities.

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### **SLC® Series 5 Carrier Configuration**

In the *SLC* Series 5 carrier FPC configuration, the DACS II connects nonlocally switched special service channels to network equipment in the office. Provisioning of the RT (remote terminal) channel units can be done over the facility data link with the Series 5 CIU (craft interface unit) connected at the DACS II. The DACS II continuously checks for discrepancies between the provisioning stored in it and the RT. The *SLC* Series 5 carrier FPB with specials interface supports the same functionality and feature set that the Mode I interface provides.

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## Background (Continued)

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### **DS0 Test Access**

Up to four DS1 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 through the Remote Test System-5A (RTS-5A) or Remote Maintenance System-Digital 1 (RMS-D1) of Switched Access Remote Testing System (SARTS). If the frame is at the full capacity, the RMS-D1 system will have to be used because the RTS-5A is too small to handle the requirements at full capacity.

---

### **Clear-Channel DS1 Test Access**

In addition, facility circuit packs can be software provisioned for clear-channel DS1 application and used for test access of other clear-channel DS1 facilities which terminate directly or terminate in DS3 signals. There is no restriction on the number of clear-DS1 network processing circuits (NPCs) that can be used for test access. There are ten possible test access configurations, including monitor and split modes with unidirectional and bidirectional connections.

---

### **Facility Performance**

DACS II also monitors the performance of connecting 1.544-Mb/s and DS3 facilities, checking for loss of signal and transmission errors. Additional facility parameters are monitored using different error-checking schemes on the DS1 signals (including those embedded in DS3).

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.

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## Physical Description

### Overview

The following section provides the physical description of the DACS II. This section is intended to provide the reader with a description of the various frame, bay, unit, and circuit pack configurations offered by DACS II.

## Frame Configurations

### Multi-Frame Configurations

Figure 1-1 shows the DACS II frame bay arrangement for a multi-bay system.

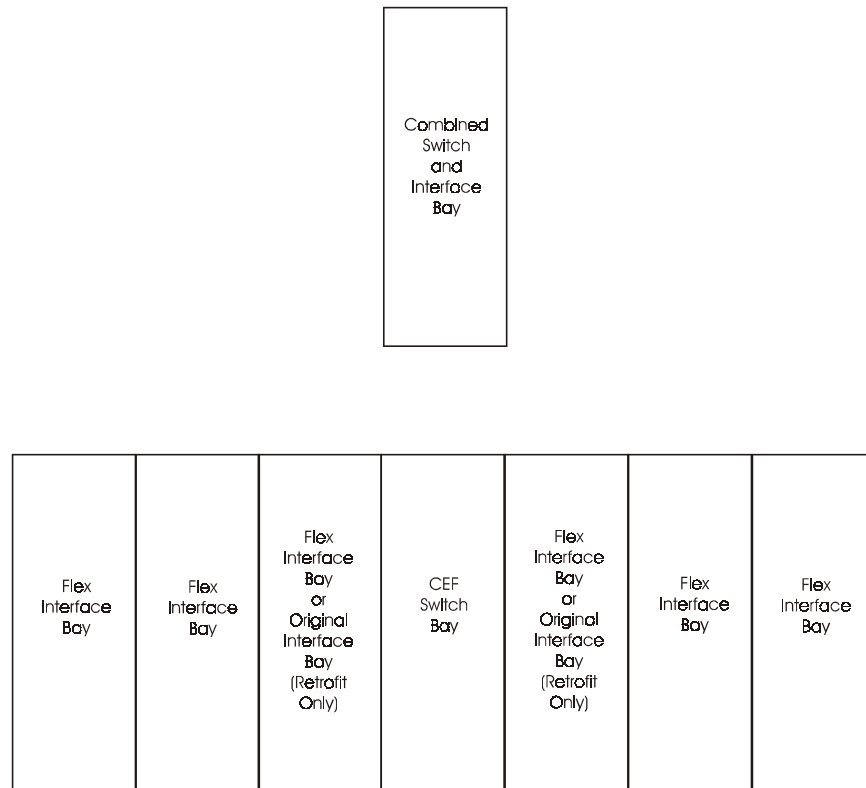


**Figure 1-1. DACS II Frame Arrangements**

With the exception of the single-bay frame, each frame is made up of one switch bay and one or more interface bays. 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.

## Frame Configurations (Continued)

**Multi-Frame Units** Table 1-1 lists the units that make up the frames.

**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                               |
|------------------------------------------------------|---------------------------------------------------------------|--------------------------------------|
| Original (one in each double - and triple-bay frame) | Original (one in double-bay frames, two in triple-bay frames) | Combination Switch and Interface Bay |
| CEF (one in each CEF frame)                          | Flexible (up to six in CEF frame)                             |                                      |

### SWITCH BAY UNITS

| ORIGINAL SWITCH BAY      | CEF SWITCH BAY       |
|--------------------------|----------------------|
| CCN (0 and 1)            | ECCN (0 and 1)       |
| Status Panel             | Status Panel         |
| Synchronizer             | Synchronizer         |
| MC (main controller)     | MC (main controller) |
| CCN Power Unit (0 and 1) |                      |
| Fuse and Alarm           | Fuse and Alarm       |

### INTERFACE BAY UNITS

| ORIGINAL SWITCH BAY       | FLEXIBLE INTERFACE BAY (FLEX BAY) |
|---------------------------|-----------------------------------|
| FTU (Maximum 2 per bay)   | IFTU (Maximum 3 per bay)          |
| Power and Control         |                                   |
| DSPU (Maximum 1 per bay)  | DSPU (Maximum 3 per bay)          |
| DS3U (Maximum 1 per bay)  | DS3U (Maximum 3 per bay)          |
| HDS3U (Maximum 1 per bay) | HDS3U (Maximum 3 per bay)         |

### SINGLE-BAY UNITS

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

## Frame Configurations(Continued)

**Unit Components** Table 1-2 lists the circuit packs in each unit for single- and multi-frame bays.

**Table 1-2. DACS II Circuit Pack Equipment**

| FUNCTION NAME                      |      |             |                 |                                                |
|------------------------------------|------|-------------|-----------------|------------------------------------------------|
| FULL                               | ABB  | CKT<br>PACK | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>ORIGINAL SWITCH BAY</b>         |      |             |                 |                                                |
| <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<br>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        |                 |                                                |
| Stratum 2                          | TBS2 | TG63        |                 |                                                |
| (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                                    |

*Continued on Next Page*

**Table 1-2. DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                       |                   |                        |                 |                                                |
|-------------------------------------|-------------------|------------------------|-----------------|------------------------------------------------|
| FULL                                | ABB               | CKT<br>PACK            | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>ORIGINAL SWITCH BAY (Cont)</b>   |                   |                        |                 |                                                |
| <i>Synchronizer, Cont</i>           |                   |                        |                 |                                                |
| BSRF                                | TXRF              | TG68                   |                 | configuration                                  |
| 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)                                    |
| <i>Main Controller</i>              |                   |                        |                 |                                                |
| Main Controller Power               | MCP               | SM565 ( $\pm 12V$ )    | MC              | 1                                              |
| Central Processing Unit 2           | CPU2              | TM778*                 | MC              | 1 (U)                                          |
| Intelligent Communication Interface | ICI               | TM 782*                | 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>               |                   |                        |                 |                                                |
| Power Unit                          | PU                | 485AB PWR UNIT (5V)    | CCN Power       | 2 (0 and 1)                                    |
| Fuse Board                          | DSR<br>FUZE<br>BD | ED-2C863-30<br>G3,ACCN | CCN Power       | 8<br><br>4                                     |

*Continued on Next Page*

**Table 1-2. DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                                                                                                                   |      |                        |                 |                                                |
|---------------------------------------------------------------------------------------------------------------------------------|------|------------------------|-----------------|------------------------------------------------|
| FULL                                                                                                                            | ABB  | CKT<br>PACK            | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>CEF SWITCH BAY</b>                                                                                                           |      |                        |                 |                                                |
| <i>ECCN</i><br>(Cross-Connect Network)                                                                                          |      |                        |                 | 2 (0 and 1)                                    |
| Bus Terminator                                                                                                                  | BT   | BBR1                   | ECCN            | 4<br>Two 0 and 1 Pairs                         |
| Clock Control Interface                                                                                                         | CCI  | BBS1                   | ECCN            | 2<br>One 0 and 1 Pairs                         |
| Expanded TSI                                                                                                                    | ETSI | BBS2                   | ECCN            | Up to 32<br>Sixteen 0 and 1<br>Pairs           |
| <i>Synchronizer</i>                                                                                                             |      |                        |                 |                                                |
| The synchronizer in the CEF switch bay uses the same circuit packs as the synchronizer in the original switch bay shown before. |      |                        |                 |                                                |
| <i>Main Controller</i>                                                                                                          |      |                        |                 |                                                |
| Main Controller Power                                                                                                           | MCP  | SM565 ( $\pm 12V$ )    | EMC             | 1                                              |
| Central Processing Unit 2*                                                                                                      | CPU2 | TM778                  | EMC             | 1                                              |
| Intelligent Communication Interface                                                                                             | ICI  | TM762                  | EMC             | 1                                              |
| Maintenance Circuit*                                                                                                            | EMTC | UM75                   | EMC             | 1                                              |
| Bus Extender*                                                                                                                   | EBX  | UM71                   | EMC             | 1                                              |
|                                                                                                                                 |      | (+12V), 411AA<br>(+5V) | MC              | 1                                              |
| Fuse Board                                                                                                                      |      |                        |                 |                                                |

\*New circuit pack CEF switch bay main controller.

*Continued on Next Page*

**Table 1-2. DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                      |                   |                     |                 |                                                |
|------------------------------------|-------------------|---------------------|-----------------|------------------------------------------------|
| FULL                               | ABB               | CKT<br>PACK         | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>CEF SWITCH BAY (Cont)</b>       |                   |                     |                 |                                                |
| <i>Status Panel</i>                |                   |                     |                 |                                                |
| Status Circuit Pack                | STAT<br>US        | ED-9C017-30         | EMC             | 1 (F)                                          |
| <b>INTERFACE BAYS</b>              |                   |                     |                 |                                                |
| <i>Power and Control Unit</i>      |                   |                     |                 |                                                |
| Central Processing Unit            | CPU               | TM657/<br>TM657B    | FTU             | 1                                              |
| Unit Bus Extender                  | UBX               | UM28                | FTU             | 1                                              |
| Power Unit                         | PU                | 411AA (5V)          | FTU             | 3 per FTU                                      |
| Fuse Board                         | DSR<br>FUSE<br>BD | ED-2C863-30<br>G1,A | FTU             | 2 (77-type)                                    |
| Fuse Board                         | DSR<br>FUSE<br>BD | ED-2C863-30<br>G2,A | FTU             | 1                                              |
| <i>FTU</i>                         |                   |                     |                 |                                                |
| NPC                                |                   |                     |                 | 1 or 2 per bay                                 |
| Dual Digroup Circuit               | DDC               | TG80/TG80B          | FTU             | 2 in each of the<br>following circuit<br>packs |
| Enhanced Dual Digroup<br>Circuit   | EDDC              | TG191               | IFTU2           | Up to 80<br>UP to 80                           |
| SLC 96 Carrier Direct<br>Interface | S96D              | TG183               | FTU             | Up to 80                                       |

*Continued on Next Page*



**Table 1-2.    DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                |      |             |                 |                                                |
|------------------------------|------|-------------|-----------------|------------------------------------------------|
| FULL                         | ABB  | CKT<br>PACK | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>INTERFACE BAYS (Cont)</b> |      |             |                 |                                                |
| <i>FTU</i> , Cont            |      |             |                 |                                                |
| SLC Series 5 Carrier         | SS5D | TG184       | FTU             | Up to 80                                       |
| Direct Interface             |      |             |                 |                                                |
| Special Zero Code            | ZDC  | TG186       | FTU             | Up to 80                                       |
| Suppression - ZBTSL          |      |             |                 |                                                |
| Dual Primary Circuit         | DPC  | TG182       | FTU             | Up to 64                                       |
| (120-ohm termination)        |      |             |                 |                                                |
| Dual Primary Circuit         | DPC  | TG185       | FTU             | Up to 64                                       |
| (75-ohm termination)         |      |             |                 |                                                |
| Dual Primary Circuit         | DPC  | TG187       | FTU             | Up to 64                                       |
| (Minor BER)                  |      |             |                 |                                                |
| Digital Signal Processing    | DSPP | TG193B      | FTU             | Up to 80                                       |
| Platform                     |      |             |                 |                                                |
| Circuit                      |      |             |                 |                                                |
| Format Converter             | FC   | TG79        | FTU             | Up to 8                                        |
|                              |      |             |                 | Four 0 and 1 Pairs                             |
| Facility Terminating         | FTMI | TG81        | FTU             | Up to 4                                        |
| Module Interface             |      |             |                 |                                                |

*Continued on Next Page*

**Table 1-2.    DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                                                                                |                   |             |                 |                                                |
|----------------------------------------------------------------------------------------------|-------------------|-------------|-----------------|------------------------------------------------|
| FULL                                                                                         | ABB               | CKT<br>PACK | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>INTERFACE BAYS (Cont)</b>                                                                 |                   |             |                 |                                                |
| <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<br>FUSE<br>BD | ED-9C011-30 | IFTU            | 16 (80-type)                                   |
| Fuse Board                                                                                   | DSR<br>FUSE<br>BD | ED-9C012-30 | IFTU            | 1 (80-type)                                    |
| Power Unit                                                                                   | PU                | 411AA       | FTU             | 3                                              |
| <i>IFTU2</i>                                                                                 |                   |             |                 |                                                |
| IFTU2 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                                              |

*Continued on Next Page*

**Table 1-2. DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                |                   |                         |                 |                                                |
|------------------------------|-------------------|-------------------------|-----------------|------------------------------------------------|
| FULL                         | ABB               | CKT<br>PACK             | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>INTERFACE BAYS (Cont)</b> |                   |                         |                 |                                                |
| <i>IFTU, Cont</i>            |                   |                         |                 |                                                |
| Fuse Board                   | DSR<br>FUSE<br>BD | ED-9C011-30             | IFTU            | 16 (80-type)                                   |
| Fuse Board                   | DSR<br>FUSE<br>BD | ED-9C012-30             | IFTU            | 1 (80-type)                                    |
| Power Unit                   | PU                | 484AA                   | FTU             | 3                                              |
| <i>DSPU</i>                  |                   |                         |                 |                                                |
| Subrate Multiplexer          | SRM               | TM739                   | DSPU            | Up to 3 per bay<br>Up to 8 pairs 0 and 1       |
| Multipoint Junction Unit     | MJU               | TM740                   | DSPU            | Up to 8 pairs 0 and 1                          |
| Digital Multipoint Bridge    | DMB               | TM665                   | DSPU            | Up to 8 pairs 0 and 1                          |
| Central Processing Unit      | CPU               | TM657 or<br>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<br>FUSE<br>BD | ED-2C863-30<br>G3, ACCN | DSPU            | 1                                              |

*Continued on Next Page*

**Table 1-2.    DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                |                   |                  |                 |                                                |
|------------------------------|-------------------|------------------|-----------------|------------------------------------------------|
| FULL                         | ABB               | CKT<br>PACK      | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>INTERFACE BAYS (Cont)</b> |                   |                  |                 |                                                |
| <i>DS3U</i>                  |                   |                  |                 | Up to 3 per bay                                |
| DS3 Multiplexer              | MXR               | KCR1 or<br>KCR5  | DS3U            | Up to 7                                        |
| DS3 Facility Line Interface  | FLI               | KCR4             | DS3U            | 2                                              |
| Formatter                    | FMT               | KER1             | DS3U            | 2                                              |
| Unit Controller              | UC                | KER2/KER6-2      | DS3U            | 1                                              |
| <i>DS3U</i>                  |                   |                  |                 |                                                |
| Power Unit                   | PU                | 563A PWR<br>UNIT | DS3U            | 3                                              |
| Fuse Board                   | DSR<br>FUSE<br>BD | ED-2C980-30      | DS3U            | 1                                              |
| <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<br>UNIT | HDS3U           | 3                                              |
| Fuse Board                   | DSR<br>FUSE<br>BD | ED-2C980-30      | HDS3U           | 1                                              |

*Continued on Next Page*

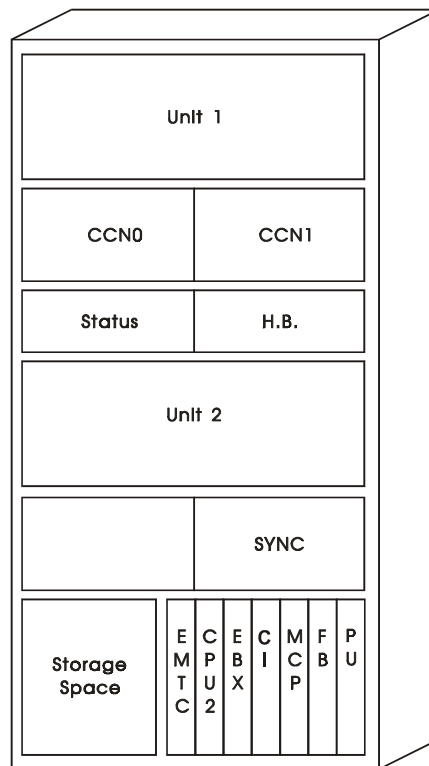
**Table 1-2.    DACS II Circuit Pack Equipment (Continued)**

| FUNCTION NAME                  |                                    |             |                 |                                                |
|--------------------------------|------------------------------------|-------------|-----------------|------------------------------------------------|
| FULL                           | ABB                                | CKT<br>PACK | USED<br>IN/WITH | NUMBER<br>REQUIRED<br>PER FRAME<br>OR UNIT (U) |
| <b>SINGLE-BAY FRAME</b>        |                                    |             |                 |                                                |
| 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                 |             |                 |                                                |
| DS3U                           | Bay units                          |             |                 |                                                |

## Frame Configurations (Continued)

### Single-Bay Frame Configuration

The single-bay frame, Figure 1-2, provides both switch and interface functions in a single frame. 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.



**Notes:**

- CCN** = Cross-Connect Network
- EMTC** = Expanded Maintenance Circuit
- CPU2** = Central Processing Unit 2
- EBX** = Enhanced Bus Extender
- CI** = Communication Interface
- MCP** = Main Controller Processor
- FB** = Fuse Board
- PU** = Power Unit

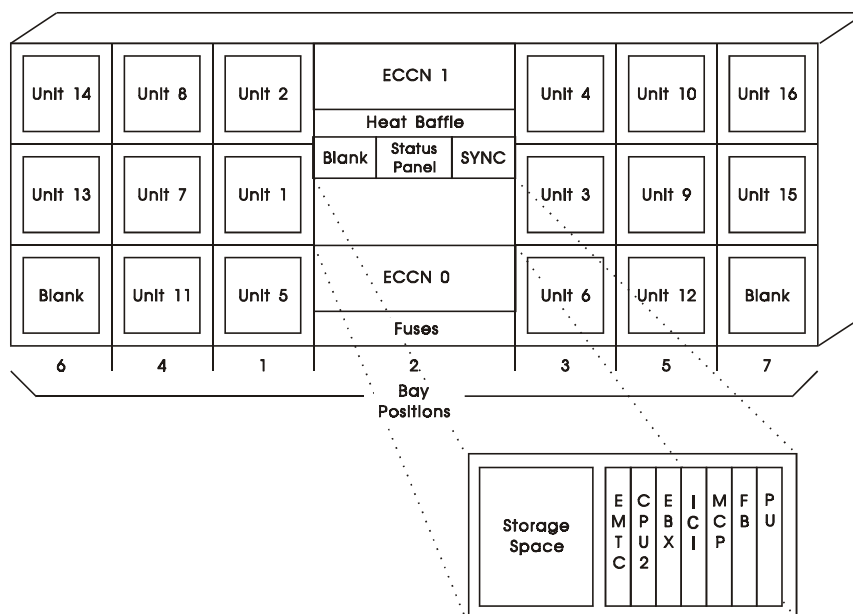
**Figure 1-2. Single-Bay Frame Arrangement**

## Frame Configurations (Continued)

### Capacity Expansion Frame Configuration

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, DS3U, 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.



#### Notes:

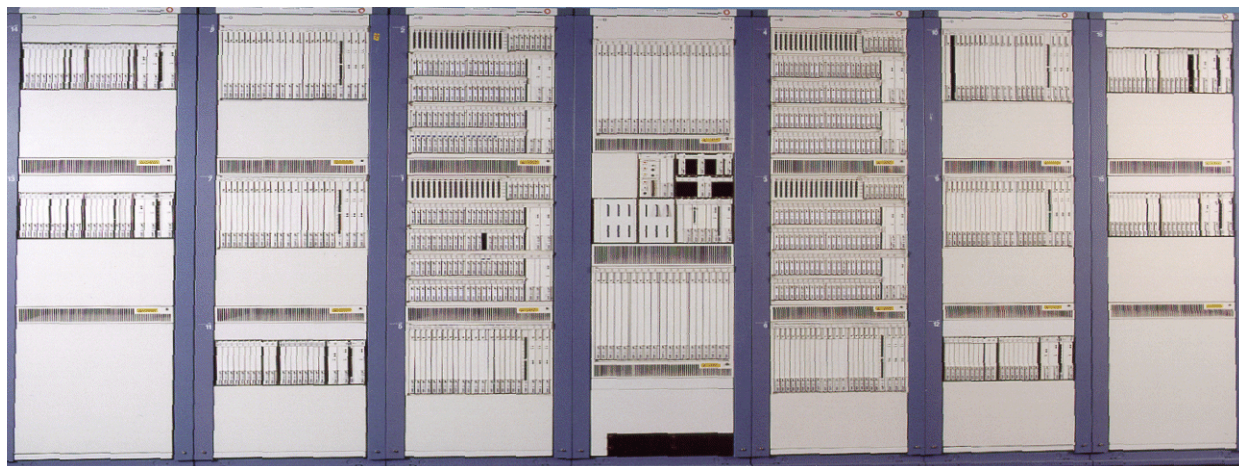
- ECCN** = Enhanced Cross-Connect Network
- EMTC** = Expanded Maintenance Circuit
- CPU2** = Central Processing Unit 2
- EBX** = Enhanced Bus Extender
- ICI** = Intelligent Communication Interface
- MCP** = Main Controller Processor
- FB** = Fuse Board
- PU** = Power Unit

(Continued on next page)

## **Frame Configurations (Continued)**

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### **Capacity Expansion Frame Configuration, Continued**



---

**Figure 1-3. Capacity Expansion Frame**

---



## **Original Switch Bay**

---

### **Description**

The original 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.

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## Original Switch Bay (Continued)

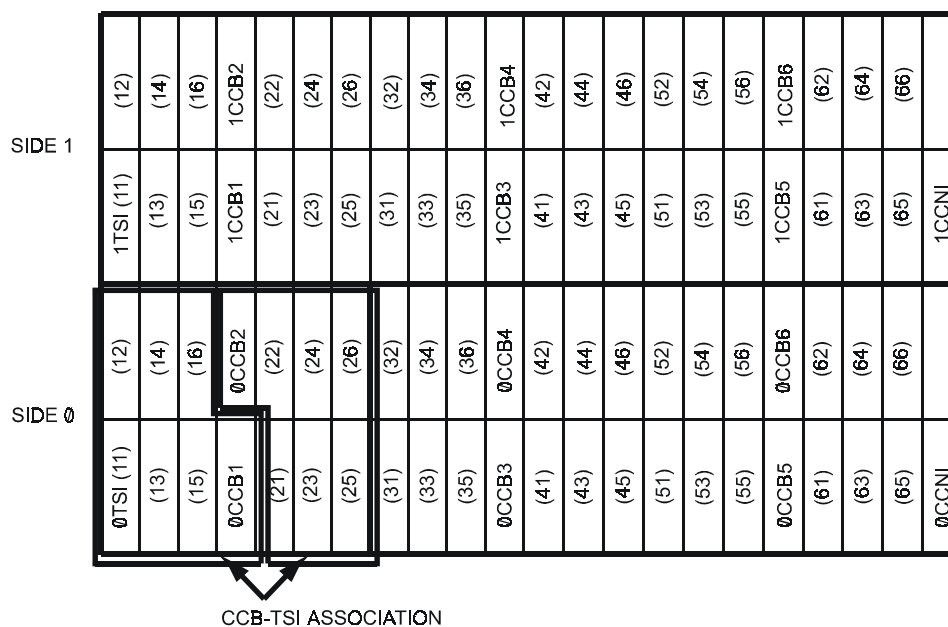
### Cross-Connect Network

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)
- 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.

Six TSI 0 and 1 pairs are installed for each interface unit (FTU, DSPU, DS3, or HDS3) in a fully-equipped frame. One CCB 0 and 1 pair is installed for each interface unit.



tpa 744614/11

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

## Original Switch Bay (Continued)

### Synchronizer and Main Controller

The synchronizer and main controller (Sync & MC) shelf, Figure 1-5, is mounted below Unit 2. 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 eight sources (4 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.

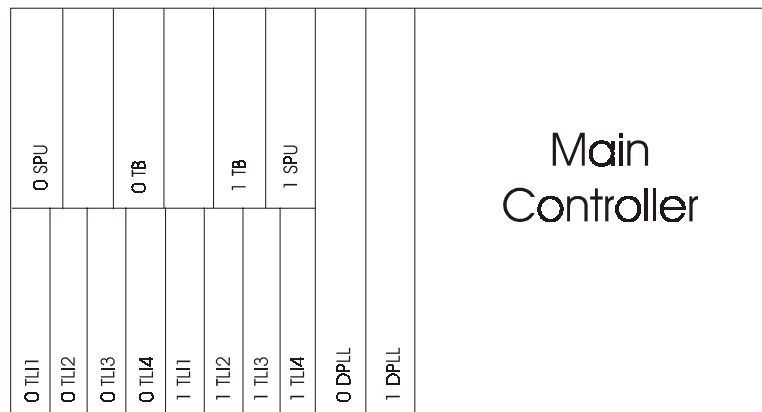


**Figure 1-5. Original Switch Bay Synchronizer and MC Circuit Pack Locations**

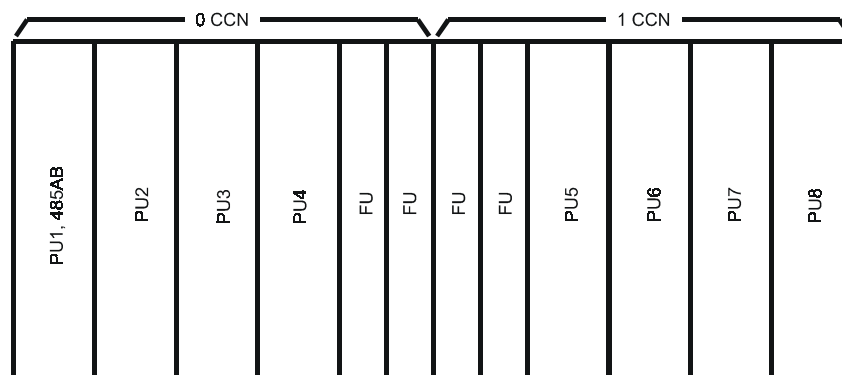
## Original Switch Bay (Continued)

### 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 +5 volt 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.



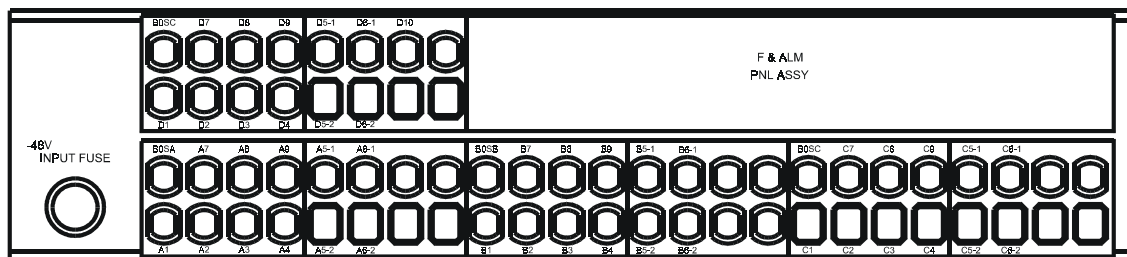
tpa 814072/11

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

## Original Switch Bay (Continued)

### 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.



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

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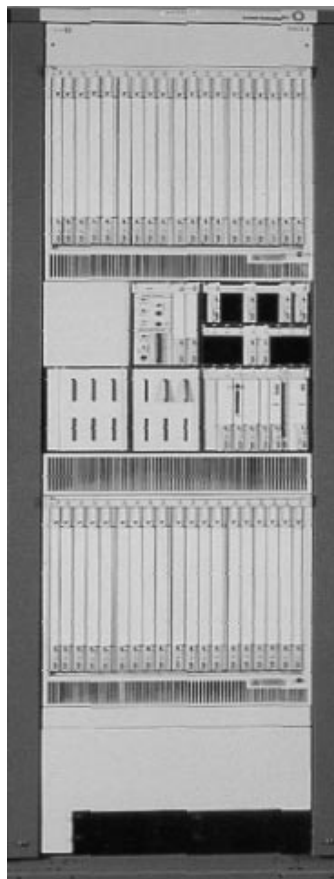
## CEF Switch Bay

---

### Description

The CEF switch bay, Figure 1-8, contains the following units:

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



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**Figure 1-8. CEF Switch Bay**

The following paragraphs briefly describe each of the units.

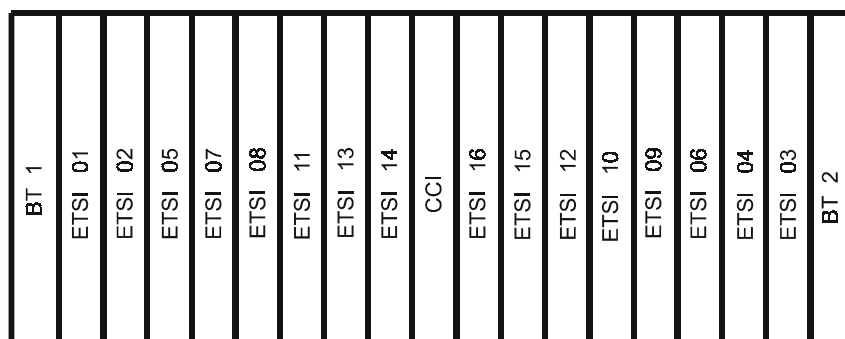
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## CEF Switch Bay (Continued)

### Extended Cross-Connect Network

The Extended Cross-Connect Network (ECCN), Figure 1-9, 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, DSPU, or DS3U).

The CCI is the interface between the ECCN and synchronizer and main controller.



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**Figure 1-9. Location of Circuit Packs on ECCN Shelf**

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## CEF Switch Bay (Continued)

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### 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.

**Table 1-3. Expanded MC Equipment**

---

| <b>Circuit Pack</b>                 | <b>Equipment</b> |
|-------------------------------------|------------------|
| CPU2                                | TM778            |
| 8-Mbyte EBX (Expanded Bus Extender) | UM71             |
| EMTC (Expanded MTC)                 | UM75             |
| 32-Mbyte ICI                        | TM 782           |

---



## Synchronizer

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.

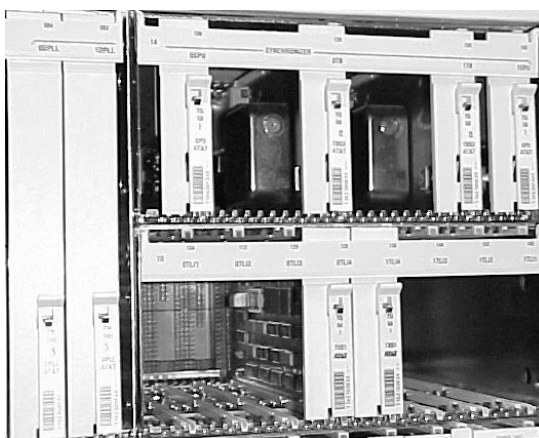
[illegible]

**Figure 1-10. CEF Switch Bay Synchronizer Circuit Pack Locations**

## **CEF Switch Bay (Continued)**

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### **Main Controller**

The main controller contains the following units:

- Extended Maintenance (EMTC)
- Central Processor Unit 2 (CPU2)
- Extended Bus Extender (EBX)
- Intelligent Communication Interface (ICI)
- Main Controller Power (MCP)
- Fuse Board (FB)
- Power converters.

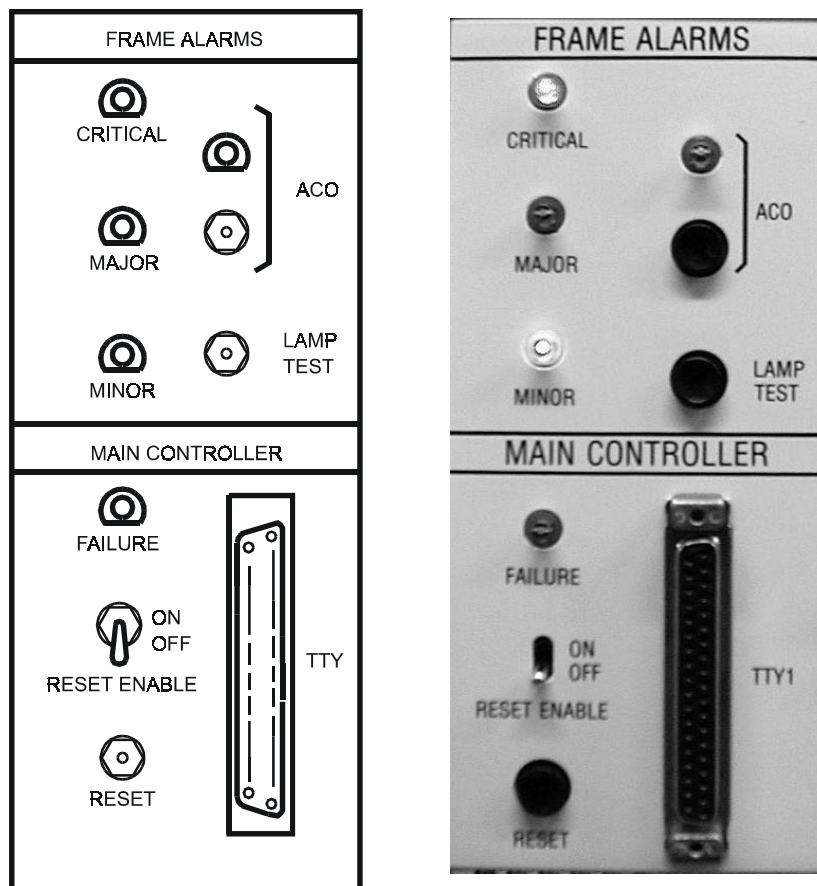
The EMTC controls the interface between the MC and the alarm circuits and units. The ICI manages the communications between the internal and external links. The EBX manages the communication between the MC and the ECCN. Two power converters and the MCP provide power for the MC.

---

## CEF Switch Bay (Continued)

### Status Panel

The status panel, Figure 1-11, 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.



tpa 814075/11

**Figure 1-11. CEF Switch Bay Status Panel**

## CEF Switch Bay (Continued)

### Fuse and Alarm Panel

The 48-volt input power is distributed through indicator fuses in this panel, Figure 1-12, to the other assemblies in the CEF switch bay.

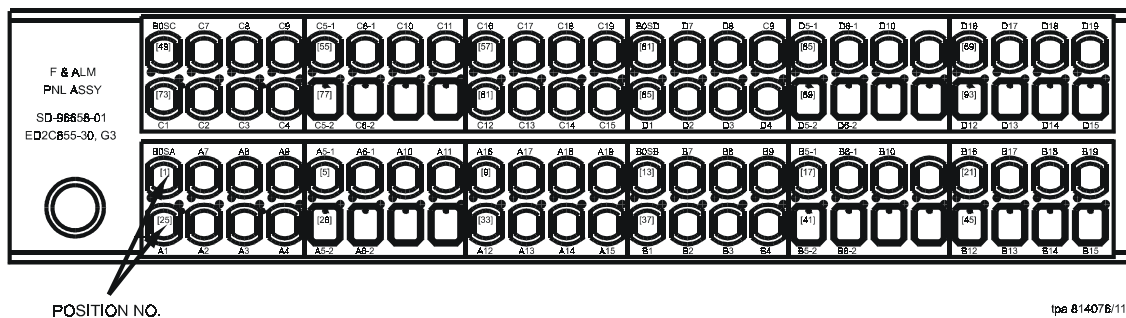


**Figure 1-12. CEF Switch Bay Fuse and Alarm Panel**

## Interface Bays

### Overview

As described previously, there are two types of interface bays:

- The original interface bay
- 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 DS3Us or DSPUs.

### 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, as shown in Figure 1-13. There is a power and control unit equipped for each equipped FTU.

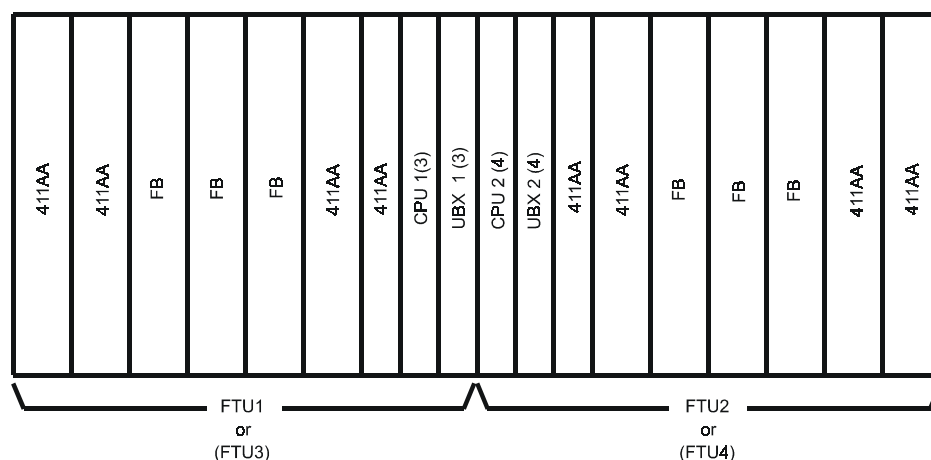


**Figure 1-13. Original Interface Bay Power and Control Unit Circuit Pack Locations**

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## Interface Bays (Continued)

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### FTU and IFTU

#### Description

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.

#### Facility Terminating Modules (FTMs)

Within an FTU, the equipment is further divided into four FTMs (see Figure 1-14, Figure 1-15, and Figure 1-16). Each FTM occupies one shelf and contains one facility terminating module interface (FTMI), an format converter (FC) for each duplicated side, and up to 20 dual digroup circuit packs of the family of various network processing circuit (NPC) applications.

#### FTU/IFTU Circuit Packs

Each dual circuit pack contains the circuitry for two NPC positions. Each NPC processes 24 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 1-15.)

#### Test Ports

Up to four NPCs on each frame can be designated NPCTPs. Each NPCTP has 12 testports. Each test port has two channels. The NPCTPs processing 64-bit DS0 channels are called test access digroups. The NPCTPs processing DS1 clear channel signals are called facility access digroups (FADs).

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## Interface Bays (Continued)

### FTU/IFTU Figures      FTU Circuit Pack Positions

Figure 1-14 displays the circuit pack positions for an FTU.

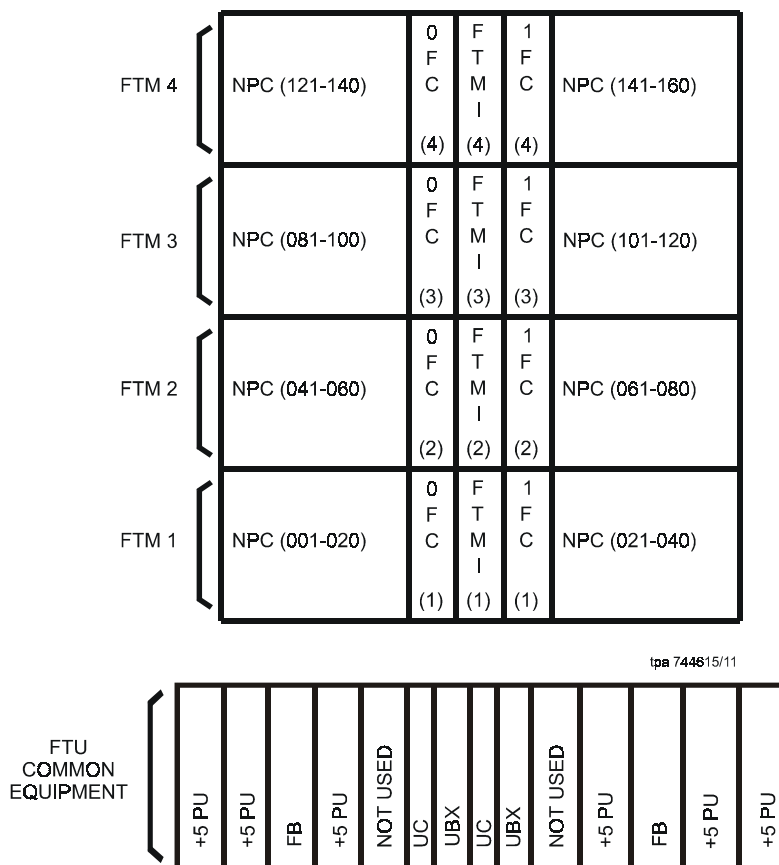


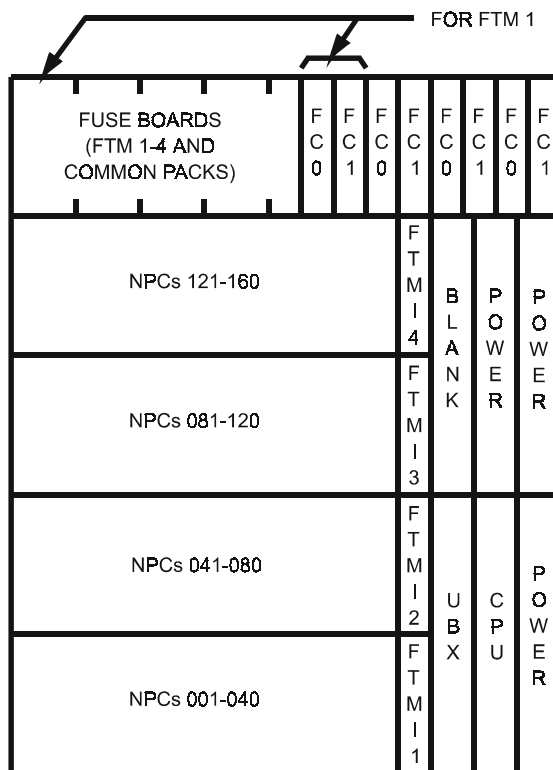
**Figure 1-14. FTU Circuit Pack Positions**

(Continued on next page)

## Interface Bays (Continued)

### FTU/IFTU Figures, Continued      IFTU Circuit Pack Positions

Figure 1-15 displays the circuit pack positions for an IFTU.



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**Figure 1-15. IFTU Circuit Pack Locations (Unit 1 Extended NPC Numbering Shown)**

(Continued on next page)



## Interface Bays (Continued)

### FTU/IFTU Figures, IFTU2 Circuit Pack Positions Continued

Figure 1-16 displays the circuit pack positions for an IFTU2.

| FUSE BOARDS<br>1-17 |                 |             |                       |             | P<br>O<br>W<br>E<br>R<br>1 | P<br>O<br>W<br>E<br>R<br>2 | P<br>O<br>W<br>E<br>R<br>3 |
|---------------------|-----------------|-------------|-----------------------|-------------|----------------------------|----------------------------|----------------------------|
| FTM 4               | NPCs<br>121-140 | F<br>C<br>0 | F<br>T<br>M<br>I<br>4 | F<br>C<br>1 | NPCs<br>141-160            | BLANK                      |                            |
| FTM 3               | NPCs<br>80-100  | F<br>C<br>0 | F<br>T<br>M<br>I<br>3 | F<br>C<br>1 | NPCs<br>101-120            |                            |                            |
| FTM 2               | NPCs<br>41-60   | F<br>C<br>0 | F<br>T<br>M<br>I<br>2 | F<br>C<br>1 | NPCs<br>61-80              | U<br>B<br>X                | C<br>P<br>U                |
| FTM 1               | NPCs<br>1-20    | F<br>C<br>0 | F<br>T<br>M<br>I<br>1 | F<br>C<br>1 | NPCs<br>21-40              |                            |                            |

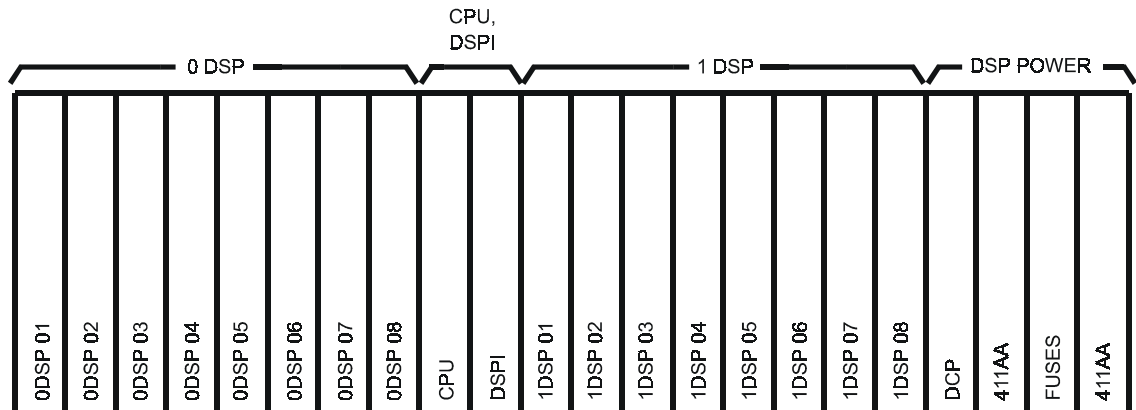
**Figure 1-16. IFTU2 Circuit Pack Locations**

## Interface Bays (Continued)

### Digital Signal Processing Unit

#### Description

The Digital Signal Processing Unit (DSPU), Figure 1-17, occupies one DACS II shelf and is equipped as needed by the customer to provide digital channel processing functions such as channel bridging and subrate channel processing. This processing is done on internal channels; no facilities terminate on the DSPUs.



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**Figure 1-17. DSPU Circuit Pack Locations**

(Continued on next page)

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## Interface Bays (Continued)

---

### Digital Signal Processing Unit, Continued

#### DSPU Circuit Packs

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
- SubRate Multiplexer (SRM) packs
- Multipoint Junction Unit (MJU) packs.

Any combination of DMBs, SRMs, and MJUs can be used. The type (or combination of types) of signal processing depends on the customer's applications and services.

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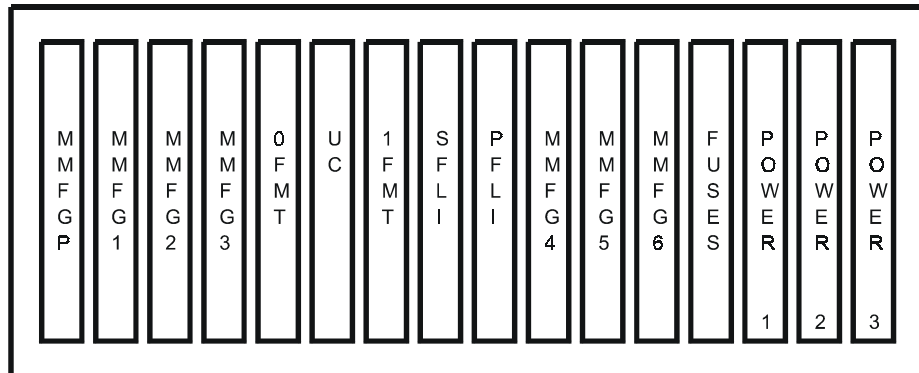
## Interface Bays (Continued)

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### DS3 Unit

### Description

The DS3U, Figure 1-18, is the designation for the shelf of equipment that is used to terminate DS3 facilities on the frame.



NOTE: EACH MMFG CONSISTS OF MXR AND MIU POSITIONS



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**Figure 1-18. DS3U Circuit Pack Positions (Photo similar to HDS3U)**

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(Continued on next page)

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## Interface Bays (Continued)

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### DS3 Unit, Continued

#### DS3U Circuit Packs

The circuit packs for this unit are 12 inches high (taller than the packs for the FTU or DSPU), but the DS3U has a smaller heat ramp so that it will fit in the unit positions in the frames. Circuit packs in the unit provide the interfaces with the DS3 coaxial lines and the ECCN or CCN and MC on the DACS II side.

#### Multiplexer-MIU Function Group (MMFG)

Each multiplexer-MIU function group (MMFG) shown in the DS3U consists of mounting positions for the multiplexer (MXR) pack and the optional MIU pack. The power units and the fuse board for the DS3U are also included in the unit.

#### Cable Connections

Two multicoaxial cable connectors are provided behind the unit to connect to the transmit and receive coaxial cables for up to six DS3 facilities. Connections to each CCN side are through eight separate ribbon cables, and the connection with the MC is through twisted pair cables.

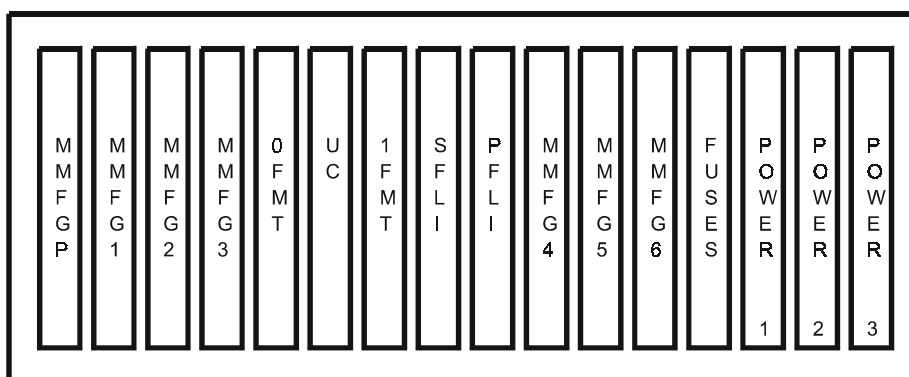
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## Interface Bays (Continued)

### HDS3 Unit

#### Description

The HDS3U, Figure 1-19, 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.



NOTE: EACH MMFG CONSISTS OF HMXR AND MIU POSITIONS

**Figure 1-19. HDS3U Circuit Pack Positions**

#### HDS3U Circuit Packs

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.

#### Hybrid Multiplexer-MIU Function Group

The Hybrid MMFG consists of the HMXR circuit pack only; the slots which previously contained MIUs for the DS3U remain empty.

#### HDS3U Unit Controller (UC)

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.

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## Single Bay

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**Description**

The single bay, Figure 1-20, combines all of the following into one bay:

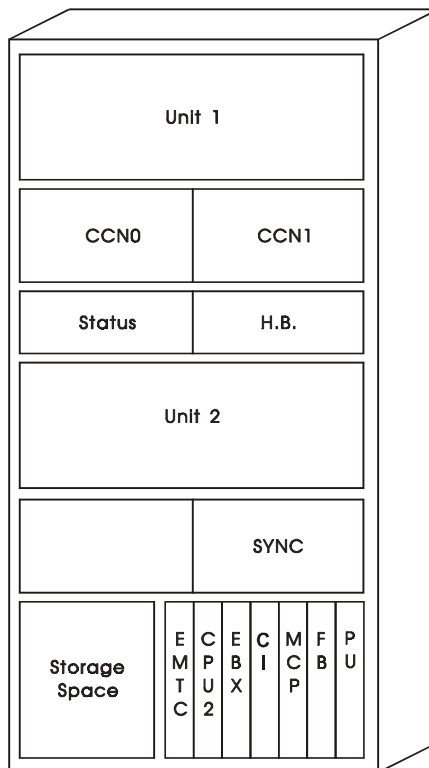
- One FTU
- One optional DSPU (or conditionally one DS3U)
- Power converters
- Control and synchronization circuitry
- A cross-connect network.

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(Continued on next page)

## Single Bay (Continued)

### Description, Continued



**Notes:**

- CCN** = Cross-Connect Network
- EMTC** = Expanded Maintenance Circuit
- CPU2** = Central Processing Unit 2
- EBX** = Enhanced Bus Extender
- CI** = Communication Interface
- MCP** = Main Controller Processor
- FB** = Fuse Board
- PU** = Power Unit

**Figure 1-20. Single Bay Frame**



## Single Bay (Continued)

### Cross-connect Network

It has a special cross-connect network, Figure 1-21, which is slimmed down to serve only two units of NPC. The cross-connect network is designated CCN2.

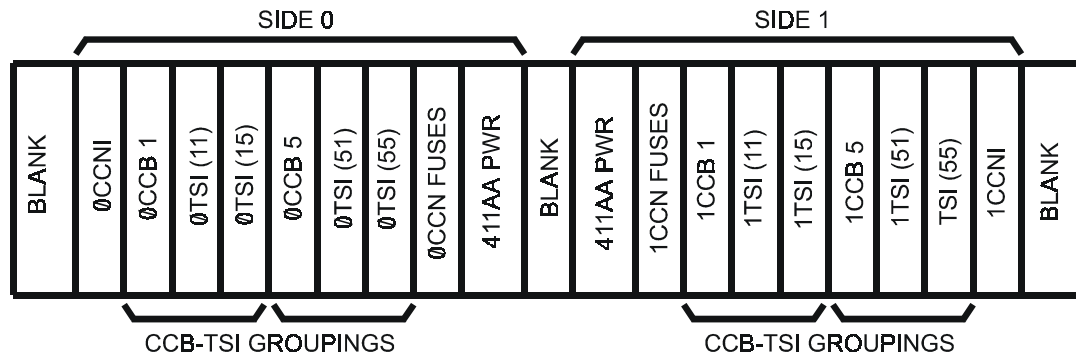


**Figure 1-21. Single-Bay Cross-Connect Network 2 (CCN2) Circuit Pack Locations**

### Unit Numbering

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 1-14), the DSPU (Figure 1-17), the DS3U (Figure 1-18), and power and control unit (Figure 1-13) are the same as comparable units in the original switch and interface bays.

## Single Bay (Continued)

### Fuse and Alarm Panel

The single-bay fuse and alarm panel is shown in Figure 1-22.

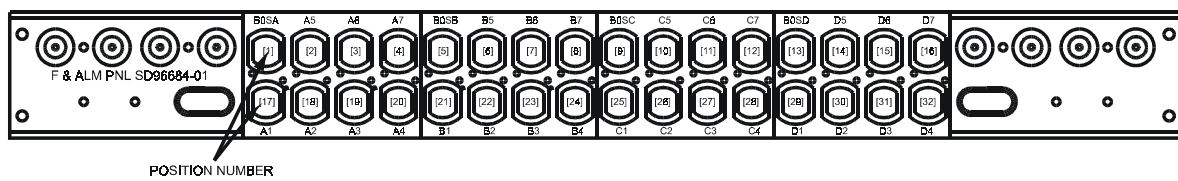


**Figure 1-22. Single Bay Fuse and Alarm Panel**

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## Functional Description

### Overview

The following section provides a functional description of the DACS II. This section is intended to provide the reader with a general knowledge of the circuit pack functions and interworkings.

---

## Basic Functionality

---

### Cross-connection Function

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.

Interface circuit packs are provided for communications within the DACS II, with administrative links to external systems, and with the office frame alarms system.

---

### Test Access Function

#### Using External Test Equipment

For test access, the time slots to be tested are cross-connected (mapped) to the time slots in the test access facility. DACS II allows test access of any channel within a facility without interfering with any other channel. Direct digital testing can be done by testing standard test equipment locally at the distributing frame or test from a remote location using the remote test system 5A (RTS-5A) or remote maintenance system-digital 1 (RMS-D1) test facility. When using RTS-5A, conversions to analog are required to allow testing voice channels. This conversion may be done externally to the DACS II in the channel bank equipment that terminates the test access facility.

#### Using the Integrated Test Set (ITS)

The Integrated Test Set (ITS) feature provides the DACS II with a built-in Bit Error Ratio Tester (BERT) capability. ITS was developed to replace expensive test sets for facility troubleshooting, providing the capability of generating, reading, and evaluating test signals from the DACS II. ITS test access is available for Nx64 kbit/s circuits.

The ITS is implemented as an application on the Digital Signal Processing (DSP) circuit pack, TG193B. The TG193B pack generates and measures the test signals and provides a test access point. To support ITS, the NPCs on the circuit pack must be grown as ST-type NPCs.

---

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## Common Equipment Circuit Blocks

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**Description**

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
  - Microprocessors to manage internal and external operations.
- 

**Redundancy**

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.

---

**Protection**

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.

---

**Expanded Circuit Blocks**

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.

---

## Common Equipment Circuit Blocks (Continued)

### System Architecture

The DACS II circuit blocks are illustrated in the system architecture block diagram in Figure 1-23 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 enhanced cross-connect network (ECCN), all of which carry the customer service, are shown across the top of the figure. Figure 1-23 shows the use of any type unit in the unit positions that require the fully flexible feature.

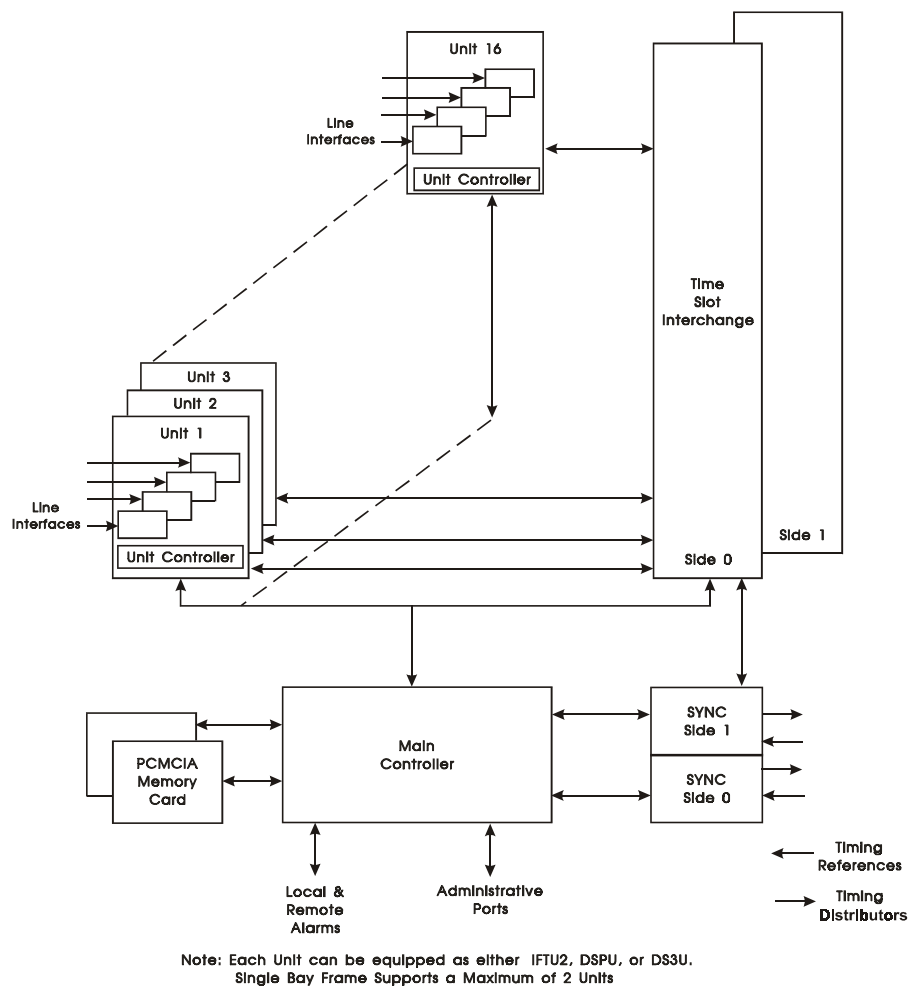


**Figure 1-23. System Architecture Diagram**

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## Common Equipment Circuit Blocks (Continued)

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### Communication/ Connections Between Blocks

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 Intelligent Communications Interface (ICI), and the alarm connections go to the maintenance pack. These major blocks are described in the following information blocks.

---

### Main and Secondary Controllers

#### Description

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.

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(Continued on next page)

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## Common Equipment Circuit Blocks (Continued)

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### Main and Secondary Controllers, Continued

#### MC Circuit Packs

The MC consists of the following circuit packs:

- Central Processing Unit 2 (CPU2)
- Intelligent Communications Interface (ICI)
- 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 ICI 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.

#### Unit Controllers

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 over the LAN 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.

The unit bus extender (UBX) serves as an interface between the UC and FTMI.

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.

---

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## Common Equipment Circuit Blocks (Continued)

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### 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) and 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.

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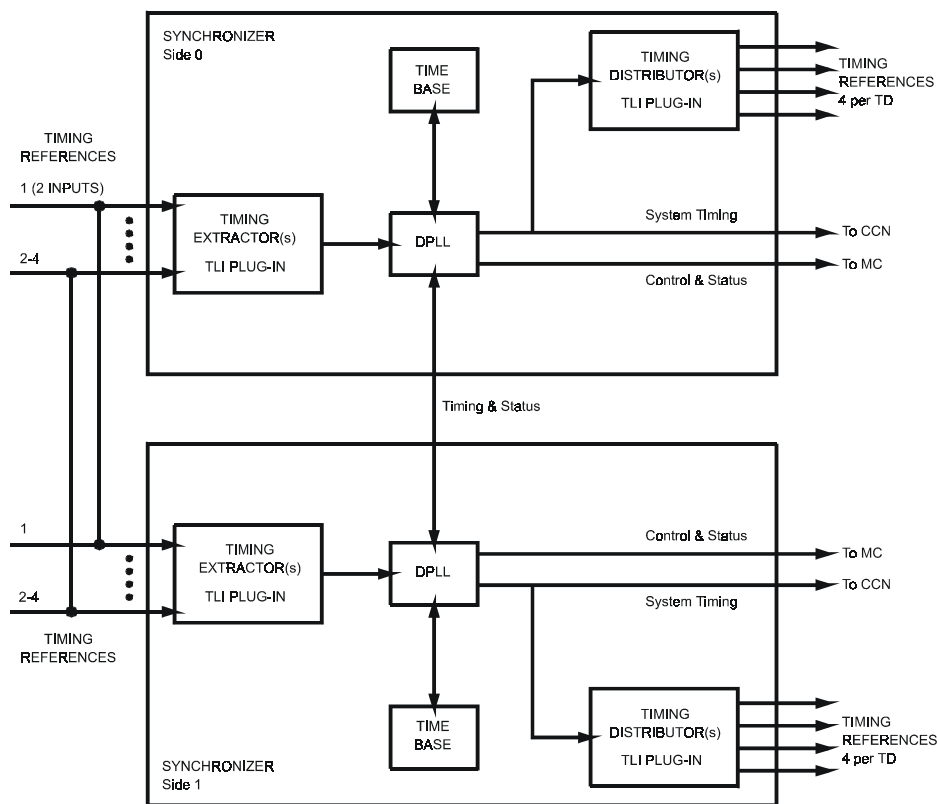


## Common Equipment Circuit Blocks (Continued)

### Internal Synchronization

### Description

Figure 1-24 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.



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**Figure 1-24. Synchronizer Block Diagram**

(Continued on next page)

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## Common Equipment Circuit Blocks (Continued)

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### Internal Synchronization, Continued

#### Timing Modes and Sources

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.

#### Synchronizer Control

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.

#### Timing References

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:

- Domestic Stratum 2
- Domestic Stratum 3
- 2.048-Mb/s CEPT Toll
- 2.048-Mb/s CEPT Local.

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## Common Equipment Circuit Blocks (Continued)

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### Internal Synchronization, Continued

#### Timing Link Signals

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.

#### Timing from 2.048 Mb/s Line Signals

In Gateway applications, 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.

#### Timing for Incoming Links

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:

- 1.544-Mb/s DS1 Transmission Lines
- 2.048-MHz basic synchronization reference frequency (BSRF)
- CCITT CEPT 2.048-Mb/s transmission lines
- Sinusoidal/square waves of various frequencies
- 64-kb/s composite clock for the digital data system (DDS).

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## Common Equipment Circuit Blocks (Continued)

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### Internal Synchronization, Continued

#### TD Signals

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.

---

## DS1 Facility Terminating Units

### Description

The IFTU2 is the peripheral unit type that is grown and equipped to terminate DS1 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 far end. A fully equipped FTU consists of four facility terminating modules (FTMs). Figure 1-25 shows the signal rates and conversions that take place in the FTM.

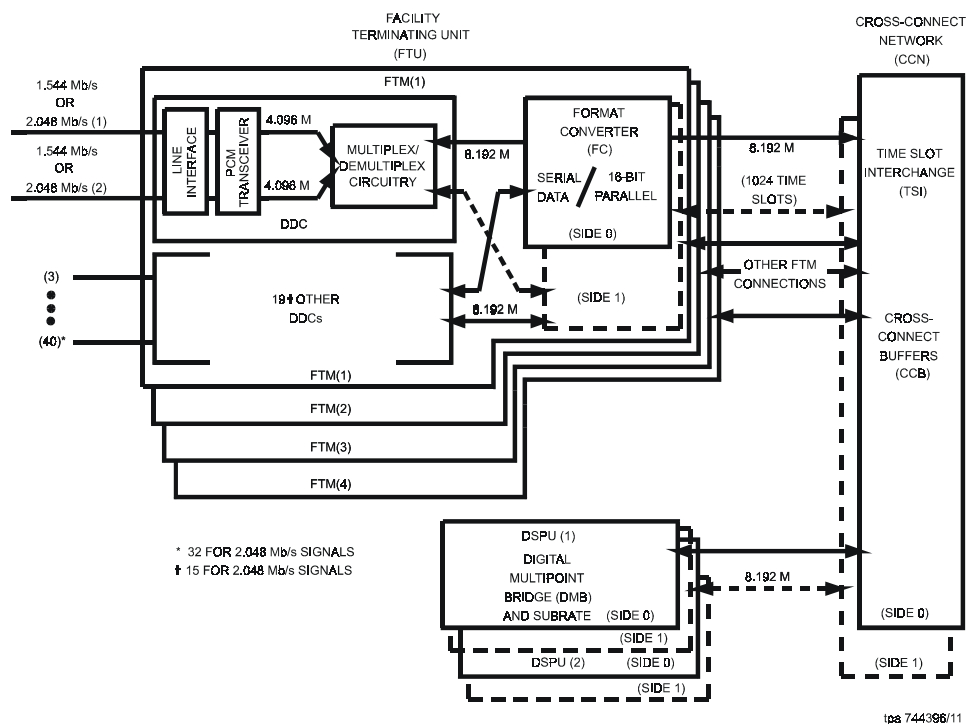


**Figure 1-25. Unit and Cross-Connect Network Block Diagram**

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## DS1 Facility Terminating Units (Continued)

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### Communication and Control

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 LAN.

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.

---

### Framing and Signaling Formats

The line interface of the NPC terminates the incoming line signals and provides the compatible framing and signaling format. Among these formats (for DS1) are:

- Superframe (Fs)
  - Extended superframe (Fe)
  - DDS data
  - D4 channel bank
  - *SLC*<sup>®</sup> 96
  - 1.544 Mb/s clear-channel lines.
-

---

## **DS1 Facility Terminating Units Continued)**

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### **NPCs on Dual Digroup Cards (DDCs)**

#### **Description**

Circuitry for two NPC positions resides on a dual circuit dual digroup circuit (DDC) pack installed in the FTMs. The NPC also:

1. Provides facility performance monitoring
2. Sends and receives facility alarms
3. Sends carrier trunk conditioning to the other end.

In addition to the line interface circuitry, the DDC contains processing circuitry to change the signals to standard form for multiplexing into higher rate bit streams internal to the DACS II.

#### **Pulse Code Modulation**

Pulse code modulation (PCM) transceivers convert the two digroup signals to higher rate signals, and a multiplexer combines these into a single bit stream that is twice the rate of each input.

#### **Redundancy and Protection**

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 DDCs 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.

#### **Line Interface Equalizer**

When the FTMI is grown in the software data base, the line interface equalizer is specified for the FTM shelf. For DS1 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.

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## Cross-Connect Networks

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### Description

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.

---

### TSI/ETSI Operations

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
- 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.

---

### Cross-connection Types

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
- Broadcast connection
- 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.

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## Cross-Connect Networks (Continued)

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### Redundancy and Protection

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.

---

### CCN Types

#### Overview

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)
- The expanded CCN (ECCN) for the capacity expansion frame (with up to 16 units). These versions of the CCN are described in the following blocks.

#### CCNs for the Non-CEF (Original Multibay) Frame

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.

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(Continued on next page)

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## Cross-Connect Networks (Continued)

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### CCN Types, Continued

#### CCNs for the Single-Bay Frame

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.

#### ECCNs for the CEF

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 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.

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.

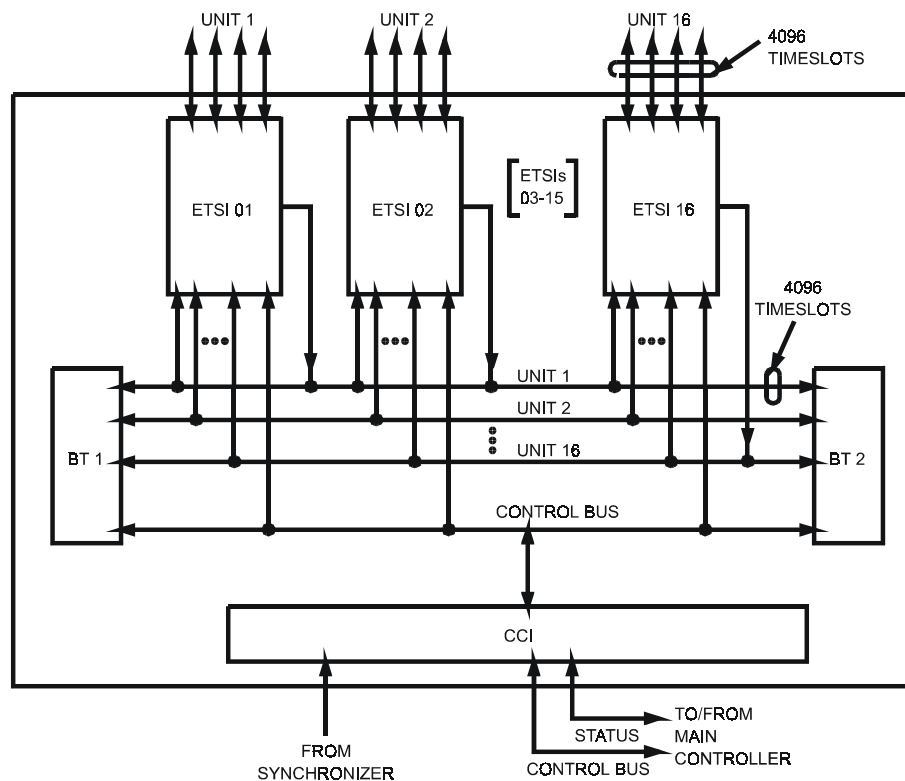
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## Cross-Connect Networks (Continued)

### CCN Types, Continued

Figure 1-26 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.



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**Figure 1-26. ECCN Block Diagram**

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## Digital Signal Processing Units

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### Description

Digital Signal Processing Units (DSPUs) are equipped with the appropriate duplicated DSP circuit packs to produce further time slot interconnections and custom arrangements such as DS0 channel bridging or subrate data multiplexing.

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.

---

### DMB Circuits

#### Description

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.

#### Capacity

Each DMB contains two conferencing devices, with each conferencer supporting 256 channels. Thus, each DMB pack can support 512 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

Channel associated signaling bits are not transmitted across the DMB.

#### Redundancy and Protection

The DMBs are duplicated for protection against service loss and connected to the respective sides of the CCN.

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## Digital Signal Processing Units (Continued)

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### DMB Circuits, Continued

#### Bridge Configurations

The following bridge configurations can be supported on the DACS II:

- Symmetrical
- Polling
- 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.

---

### Subrate Circuits

Other DSP circuit packs provide subrate channel data processing. Subrate processing includes those functions into the DACS II that are done by external DDS multijunction units and subrate multiplexers. These functions are described under the heading *Feature Functions*.

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## Frame Alarm Indications

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### Alarm Indication Types

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

#### Description

Carrier Failure Alarms 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.

#### Facility Protection Switching

Facility protection switching is provided with the *SLC*<sup>®</sup> carrier feature to switch service to the protection line and thereby avert a carrier failure situation. Whenever a red alarm exists, DACS II sends a yellow alarm signal to the other end.

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## **Frame Alarm Indications (Continued)**

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### **Carrier Failure Alarms, Continued**

#### **Alarm Conditions**

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).

#### **Alarm Indication Signal (AIS)**

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 Carrier Failure**

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.

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## **Frame Alarm Indications (Continued)**

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### **Carrier Failure Alarms, Continued**

### **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 lists some examples for DS1 lines:

1. Line bit errors
2. Errored seconds
3. Severely errored seconds
4. Cyclic redundancy check errors
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.

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## Status Panel Functions

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### Description

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.

---

### Alarm Classifications

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 North American 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 nonservice-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).
- 

### Switches

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.
-

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## Powering

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### Power Distribution

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.

---

### Protection Mechanisms

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
- Power shutdown circuits - to prevent overvoltage or overcurrent damage.

---

### Power LEDs

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.

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## Powering (Continued)

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### **Redundancy and Protection**

The power protection philosophy for circuit pack power units is based on the use of N+1 redundant power converters that supply the load in a converter group. Sufficient power reserve is available when a single 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.

---

### **ECCN Power**

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.

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## Feature Functions

**Overview**                      The following section provides specific descriptions of DACS II feature functions. The section is intended to provide the reader with an overview of the feature and how it operates.

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### Gateway Feature

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**Description**                      The DACS II gateway feature enables North American 1.544 Mb/s and international 2.048 Mb/s facilities to coexist within a DACS II system for translation and cross-connection between the two disjointed facilities.

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**Gateway IFTU2**                      When DACS II is used as a gateway between international and North American facilities, the international side of the IFTU2 is equipped with the appropriate dual primary circuit (DPC) circuit packs and the North American side is equipped with dual digroup circuit (DDC) circuit packs. Only 32 of the 40 NPC positions in an IFTU2 module can be equipped for the 2.048-Mb/s interface.

---

## Gateway Feature (Continued)

### A-Law and $\mu$ -Law Conversions

The DACS II performs several functions in providing the gateway feature. The DACS II does North American  $\mu$ -law and international A-law pulse code modulation (PCM) translation, provides signaling conversion between North American robbed bit and the international abcd bit signaling, and performs point-to-point as well as point-to-multipoint DS0 cross-connections. In addition, the DACS II provides a host of performance monitoring and maintenance functions for efficient and effective facility translation and transmission.

The DPC performs the conversions between the 4-bit and 2-bit signaling and the A-law and  $\mu$ -law voice encoding in the two signals, as shown in Figure 1-27.

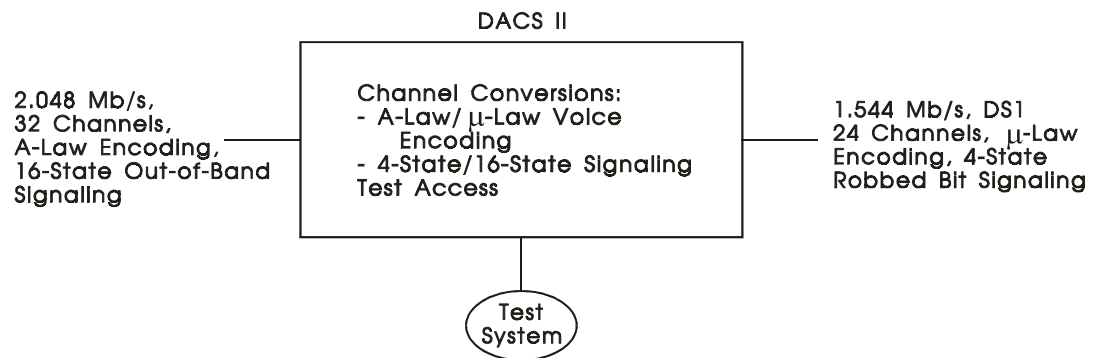


**Figure 1-27. Gateway Signal Conversions**

### No A-Law and $\mu$ -Law Conversions

Cross-connect command fields NAM, <tc>, and <sc>, are applicable for a gateway connection. The NAM field (no A-law to  $\mu$ -law conversion) disables the conversion for data signals that are already in digital form (no encoding). The <tc> field identifies the type of DS1 circuit to DACS II (signaling or transparent) and specifies trunk conditioning. The <sc> field (signaling conversion) allows setting signaling bits (abcd) to 0 or 1, inverting bits, or passing bits through unchanged. This field is used in gateway to dictate how signaling bits (c and d) which are not used on both sides are to be set.

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## **DACS II *SLC*<sup>®</sup> Carrier Direct Interface**

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### **Description**

The *SLC* carrier direct interface eliminates costly external equipment required to terminate *SLC* carrier facilities and provides grooming functions for these interfaces.

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### ***SLC* Configurations**

#### **Termination Types**

Special NPC circuit packs (S96D, SS5D, and TG80B) allow the DACS II to terminate lines from connecting RTs for the following:

- *SLC* carrier Modes I and III
  - *SLC* Series 5 carrier feature package B (FPB) and FPC.
- 

(Continued on next page)

## DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)

### *SLC* Configurations, Continued

#### **SLC 96 Carrier Mode III or Series 5 Carrier FPC**

The *SLC* 96 carrier Mode III or *SLC* Series 5 carrier FPC configuration, Figure 1-28, multiplexes special service channels only, on up to two or four (Series 5 FPC) bidirectional DS1 facilities. Each Mode III configuration uses a 2.2-kb/s data link derived from the Fs framing bit to carry alarm and protection switching information between the RT (remote terminal) and DACS II. The Series 5 FPC configuration uses the ESF framing format that has a 4-kb/s data link. The DACS II terminates the Mode III or Series 5 carrier lines, processes and terminates the *SLC* carrier data link, supports facility protection switching between the *SLC* carrier RT and DACS II, and routes the associated DS0 channels onto intraoffice or interoffice facilities, depending on the application.

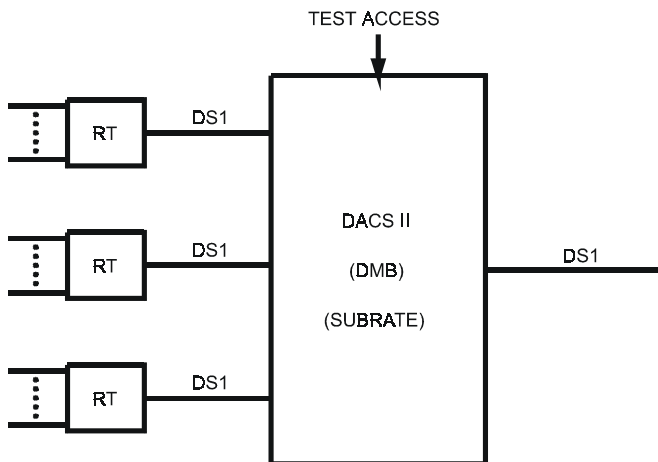


**Figure 1-28. DACS II *SLC* 96 Carrier Mode III and *SLC* Series 5 Carrier FPC Interface**

(Continued on next page)

## DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)

### *SLC* Configurations, Continued

#### **SLC 96 Carrier Mode I or Series 5 Carrier FPB**

The *SLC* 96 carrier Mode I or Series 5 FPB configuration, Figure 1-29, carries both locally switched and special service channels on up to four bidirectional DS1 facilities. The *SLC* carrier data link carries alarm, protection switching, and maintenance information between the RT, DACS II, and the digital switch. DACS II terminates the Mode I or Series 5 FPB interface, passes the switched DS0 channels and its associated data link maintenance information to a digital switch, supports facility protection switching between the *SLC* carrier RT, and grooms out the nonswitched channels onto intraoffice or interoffice facilities, depending on the application.

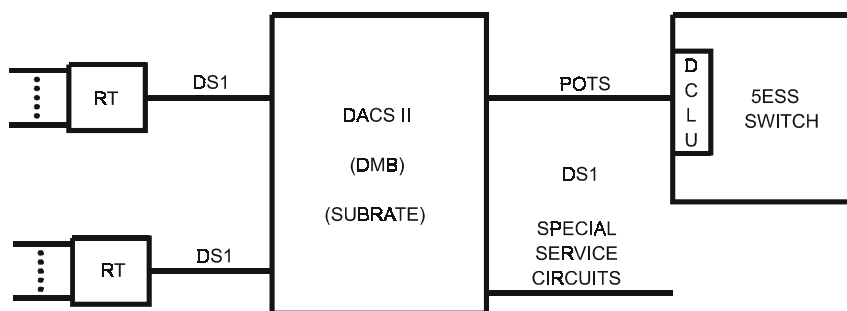


**Figure 1-29. DACS II *SLC* 96 Carrier Mode I and *SLC* Series 5 Carrier FPB Interface**



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## **DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)**

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### **Framing Format for *SLC* 96 Carrier Interface**

The *SLC* 96 carrier RT uses the derived Fs framing format to communicate with the central office equipment. The derived Fs framing format is a 4-kb/s data link (on digroup A) with 2.2kb/s carrying data and 1.8kb/s sharing the bit position with the D4 signaling frame (Fs) format.

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### ***SLC* 96 Mode I 5:4 Protection Feature**

A 5:4 protection arrangement for the Mode I and FPB interface feature replaced the existing 5:5 arrangement. There is no protection line between DACS II and the digital switch with the 5:4 arrangement. Every digroup (including DGA) will only be protected between DACS II and the RT; no protection switching is performed on the DL digroups.

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### **Framing Format for *SLC* Series 5 Carrier FPC Interface**

The *SLC* Series 5 carrier RTs communicate with the central office equipment by means of a 4-kb/s data link derived from the DS1 bit stream of digroup A. The framing format for this data link is the ESF (extended superframe format) with the D4 channel counting sequence.

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## DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)

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### Circuit Pack Requirements for *SLC* Carrier Interface

The DACS II hardware required to achieve the *SLC* carrier direct interface consists of the TG183 *SLC* 96 carrier dual card (S96D) and the TG184 *SLC* Series 5 carrier dual card (SS5D). The TG183 pack is also used for *SLC* Series 5 carrier FPB with Specials (FPBw/S) which is the Series 5 equivalent of *SLC* 96 carrier Mode I. These circuit packs can be used in any of the DDC (dual digroup circuit) slots of the facility terminating units. The S96D and SS5D circuit packs can be grown in DACS II as either a DS-type or a DE-type NPC. When grown as a type DS NPC, these cards provide a line interface with the following characteristics:

- Fs or ESF format DS1 signal (as required) with data link for status and protection switching communications
- 9-state signaling for coin telephone circuits
- *SLC* carrier alarm handling and data link communications
- Facility performance monitoring
- Line signal loopback capability
- *SLC* 96 Carrier Mode I and Mode III.

The TG80B circuit pack can be used for the *SLC* 96 carrier Mode I and Mode III non-data-link-carrying digroups; it can also be used for the *SLC* Series 5 carrier FPBw/S interface for non-data-link-carrying digroups. The TG184 is required for all digroups for the *SLC* Series 5 carrier FPC interface.

When grown as a DE type, the S96D and SS5D circuit packs perform all the functions of the DDC. The DACS II software enables the line protection switching and allows all 96 channels from the different *SLC* carrier digroups to be addressed on digroup A by means of the DACS II commands. The protection switching is done by automatically cross-connecting the failed line channels to the standby protection line.

---

### Alarms in *SLC* 96 Carrier Mode III Interface

The alarm field of the data link specifies framing, major, minor, power/ miscellaneous, and digroup alarms as well as far-end loopback (FELP) command messages for all shelves. DACS II recognizes, detects, and declares the associated alarm condition when an alarm message is received in the alarm field of the data link from the RT.

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## DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)

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### Alarms in *SLC* 96 Carrier Mode I or Series 5 Carrier FPB Interface

DACS II can recognize, detect, and declare alarm conditions from either the RT end or the local switch end. DACS II will always intercept and overwrite the alarm bits of the data link, regenerate other bits, and transmit over the data link to the far end. Therefore, when a failure occurs between DACS II and the digital switch, instead of generating an alarm condition on the entire DS1, DACS II will trunk-condition each channel of the affected POTS circuits in the direction of the RT. In this way, the non-locally-switched channels between the RT and DACS II remain unaffected and their service is not impaired. DACS II always passes major and power/misc alarms received from the RTs to the local digital switch.

---

### Alarms in *SLC* Carrier Series 5 FPC Interface

Three types of alarms are available from the *SLC* Series 5 carrier system:

- The alarm indication signal (AIS) on each digroup
- Yellow alarm on each digroup
- Alarm information on the digroup A data link for all digroups.

The alarm information carried on the data link includes major, minor, power/miscellaneous, and carrier line failure alarms for the near end and the far end. DACS II recognizes, detects, and declares all alarm conditions received from the *SLC* Series 5 carrier system.

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### Maintenance in Mode III or Series 5 FPC Interface

#### DS1 Facility Monitoring

DACS II monitors for and detects loss of data link data, out-of-frame (OOF) conditions, loss-of-signal (LOS) conditions, and bipolar violations (BPVs) for *SLC* 96 carrier, and cyclic redundancy checking (CRC) for Series 5 on the DS1 lines.

#### Line Loopbacks

There are two line loopbacks supported by DACS II in the *SLC* carrier interface.

- Line Interface Loopback (LILB)

The DS1 signal is internally looped back to sectionalize a failure to the DS1 line interface. DACS II can do an LILB automatically after a manual protection switch is done. DACS II does this loopback the same way it is done in the *SLC* carrier systems.

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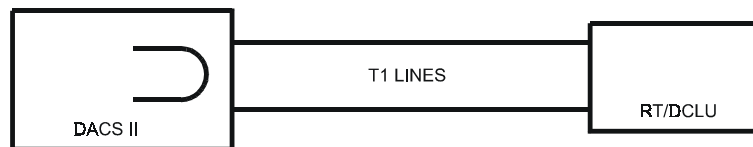
## DACS II *SLC*® Carrier Direct Interface (Continued)

### Maintenance in Mode III or Series 5 FPC Interface, Continued

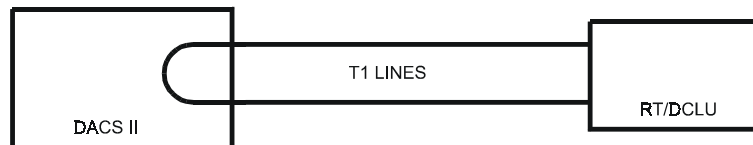
#### ■ Line Loopback (LLB).

DACS II is capable of initiating or terminating an LLB in response to a manual request entered over one of the administrative links. If the LLB is initiated by DACS II, the FELP message is used to request that the channel bank loop the incoming DS1 signal to the output bitstream. If DACS II receives an FELP message from an RT or digital carrier line unit (DCLU), DACS II performs a full DS1 loopback towards the bank it received the message from. LLBs allow craft personnel to do single-ended fault location of the looped digroup from the near end. The LILB and LLB are illustrated in Figure 1-30.

A. DACS II PERFORMING AN LILB



B. DACS II TERMINATING AN LLB (DACS II RECEIVES FELP MESSAGE)



C. DACS II INITIATING AN LLB (DACS II TRANSMITS FELP MESSAGE)



tpa 783482/11

**Figure 1-30. Line Interface and Line Loopbacks**

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## **DACS II *SLC*<sup>®</sup> Carrier Direct Interface (Continued)**

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### **Maintenance in Mode III or Series 5 FPC Interface, Continued**

#### **Protection Line Switching**

A protection line and the associated digroups at each end can be equipped to carry service if one of the primary lines fail. Switching of service onto the protection facility is accomplished by coordination of the equipment at each end of the facility over the *SLC* carrier data link. At the DACS II end, the facility switching is accomplished by automatically cross-connecting all the affected service channels to channels of the protection digroup. Protection switching can also be initiated manually by entry of a command.

When not directly in use, the protection line is continuously powered and monitored and carries duplicate service for the RT A-shelf main line. Since the protection line must be able to carry DGA service, the DGP must be provisioned with a *SLC* carrier data link.

---

### **Maintenance in Mode I or Series 5 FPB Interface**

DACS II performs the same maintenance procedures for both special service channels and POTS channels. For protection switching, there is a protection line on the RT side of DACS II. When the digroup with the data link needs to be protected, DACS II will ensure that the data link continues to be passed through to the switch. If non-locally-switched special service channels are involved on the failed line, DACS II reconfigures its cross-connect map and switches the special service channels to the protection digroup.

---

### **CIU for *SLC* Carrier and Series 5 Carrier**

The craft interface unit (CIU) can be plugged into the channel test unit (CTU) of a Series 5 carrier RT, or it can be connected to a DACS II administrative port. All the transmission and signaling options for the channel units are entered from the CIU by commands sent to the RT bank controller (BC). The CIU transmits the information to the BC, which stores the information in nonvolatile system memory. Since the information is stored, the provisioning can be done before the channel units are installed; then when installed in the frame, the BC writes into the channel unit registers.

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## DACS II Subrate Feature

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### Description

The DACS II Subrate feature is implemented in DACS II by adding two new circuit packs to the existing digital signal processing unit (DSPU). The subrate multiplexer (SRM) and the multipoint junction unit (MJU) circuit packs under the control of the software provide all the functions of a DDS hub including the following:

- Subrate multiplexing
  - Dataport error correction
  - DS0A and DS0B cross-connect capability
  - Secondary channel capability
  - Multipoint bridging
  - Parity channel error correction.
- 

### Subrate Processing

Figure 1-31 shows that access to the Subrate feature is provided by cross-connecting an incoming channel from a facility digroup to a DSPU equipped with SRM and MJU circuit packs. The required digital data functions are performed, and the resulting signal is sent back to the cross-connect network (CCN).

Multiple circuit processing functions such as those for a circuit that requires both subrate multiplexing and multipoint bridging are performed by connecting the desired functions in tandem by means of the CCN. Functions located on the same Subrate feature card can also be connected in tandem by means of the CCN.

Subrate error correction can be associated with any multiplexer or MJU circuit, or it can exist as a separate stand-alone function.

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## DACS II Subrate Feature (Continued)

### Subrate Processing, Continued

Once all required processing is performed, the signal is then cross-connected by means of the CCN to the outgoing facility. The internal cross-connections are done automatically by the system.

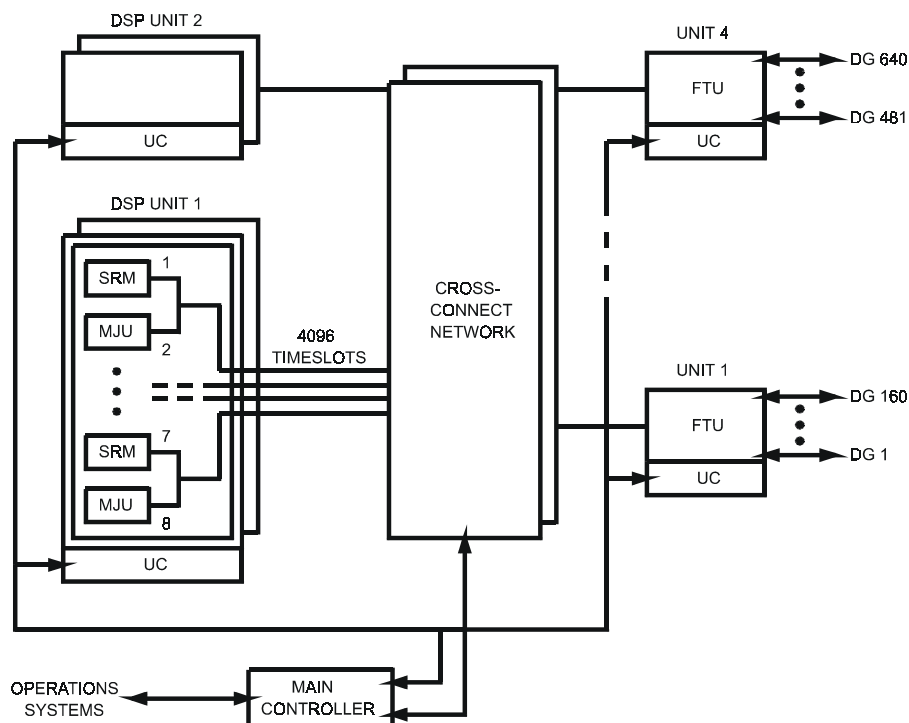


**Figure 1-31. DACS II With Subrate Feature—System Architecture**

## DACS II Subrate Feature (Continued)

### SRM Circuit Pack

The SRM circuit pack provides standard digital data subrate multiplexing of 2.4, 4.8, and 9.6-kb/s DS0A formatted signals and dataport error correction. The SRM functions are illustrated in Figure 1-32. The SRM circuit pack provides three types of subrate multiplexers that multiplex five, ten, or twenty subrate channels.

Any subrate channel interfacing the SRM circuit pack can have dataport subrate error correction performed on it as an independent function or in combination with multiplexer processing. Similarly, 56-kb/s DS0A channels can interface the circuit pack and have parity channel error correction performed as an independent function. This function can also be performed on the DS0B channel associated with any multiplexer.

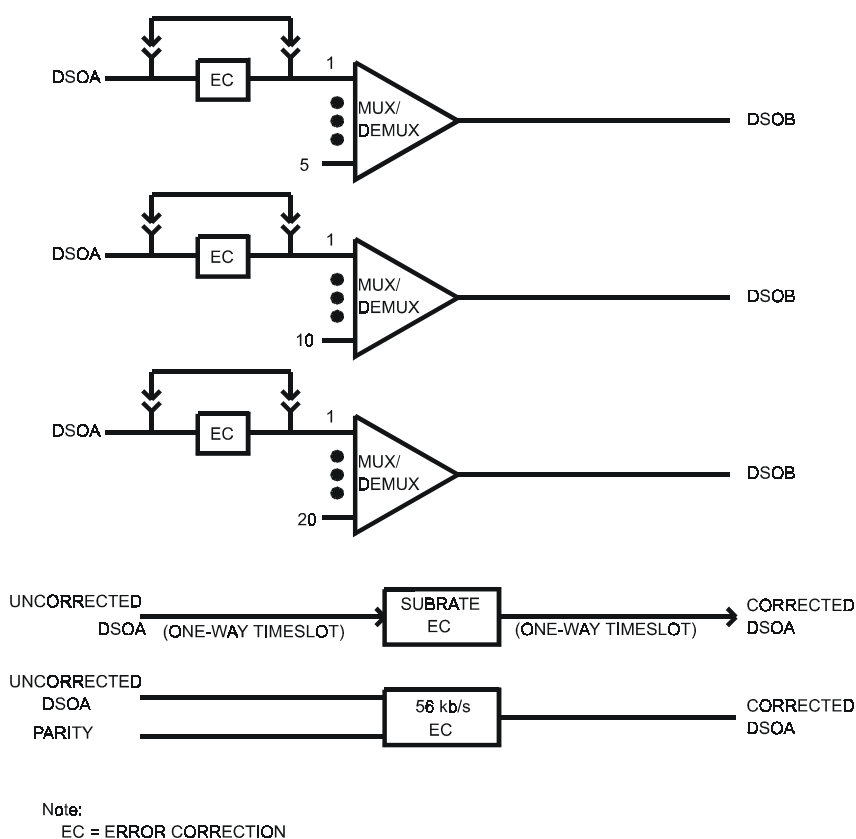


**Figure 1-32. SRM Functions**



## DACS II Subrate Feature (Continued)

### MJU Circuit Pack

The MJU circuit pack provides multipoint bridging of subrate and 56-kb/s DS0A formatted signals and provides dataport error correction. These functions are illustrated in Figure 1-33. This bridging is equivalent to that done in external multipoint junction units. Each MJU provides one control leg and four branch circuits. Multipoint circuits requiring more than four branches are formed by cascading MJU branch circuits to the control leg of additional MJUs.

The MJUs operate at 2.4, 4.8, 9.6, and 56 kb/s and do the signal processing necessary for the secondary channel capability. As with the SRM circuit pack, channels interfacing the MJU circuit pack can have subrate or parity channel dataport error correction done on them as an independent function or as part of the MJU processing. The MJU circuit pack also provides digital data system (DDS) maintenance functions (blocking, branching, and loopback) in response to automated bit access test system (ABATS) commands. The hub identifier (HUBID) must be provisioned by software before the MJU can be grown.

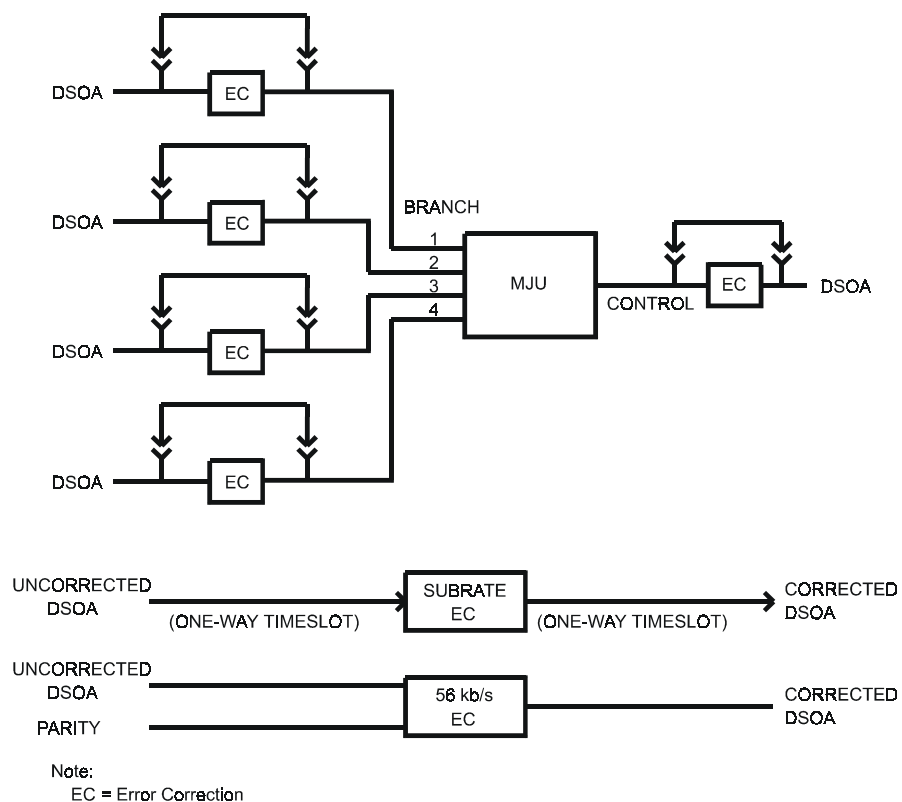


**Figure 1-33. MJU Functions**

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## **DACS II Subrate Feature (Continued)**

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### **DACS II Subrate Capacities**

The DSPU supports up to eight circuit packs that are duplicated for protection. The DSPU can support any combination of SRM, MJU, and digital multipoint bridge (DMB). All are designed for use in the DSPU. Each circuit pack position has a capacity of 512 time slots.

The MJU circuit pack supports up to 102 multipoint junction units with 1 control leg and 4 branch circuits per multipoint junction unit. The number of subrate multiplexers supported on the SRM circuit pack depends on the mix of 2.4, 4.8, or 9.6-kb/s channels. The 5-channel SRM uses 6 time slots per multiplexer. The 10-channel SRM uses 11 time slots per multiplexer. The 20-channel SRM uses 21 time slots per multiplexer. These capacities do not include error correction. Three time slots are required if parity channel error correction is included on a 56-kb/s DS0A channel. Additional time slots are required to do subrate DS0A error correction only when there is no multiplexer or MJU involved. The system reserves the total number of time slots needed for each function to ensure that access is always possible for every channel or port. This ensures that the system will be nonblocking for all cross-connections.

---

### **DACS II Subrate Memory Administration**

The subrate data base and all operations are controlled by the main controller in the frame. All equipment status and circuit maps associated with the Subrate feature are stored on the DACS II Primary Memory Card (PMEM) as a backup for the volatile memory in the frame. If there is a loss of data in the volatile memories (RAM), DACS II can be rebooted from a cold boot. Cold boot is defined as a manual reset of the DACS II that results in all controllers being reset, the data base being downloaded from the PMEM, and all hardware assignments being reestablished from PMEM information.

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## **DS3 Termination Feature**

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### **Capacity**

Each DS3U terminates up to six DS3 coaxial lines and contains the equipment to demultiplex the DS3 asynchronous signals into component DS1 signals and to DS0 channels for connection to the existing CCN for cross-connection.

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### **Connections**

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. The DS3U equipment also offers DS3 and DS1 signal performance monitoring.

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## DS3 Termination Feature (Continued)

### Circuit Packs

### Overview

Figure 1-34 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 formatter (FMT) forms the interface with the CCN on the DACS II side. At the heart of the multiplexer-multiplexer functional group (MMFG) is the multiplexer (MXR) which contains the muldem (multiplexer-demultiplexers) to make the signal conversions between the DS1 and DS3 (M13 muldem) and between the DS1 and DS0 (M10 muldem). The functions of these packs are detailed in the following subheadings for those packs.

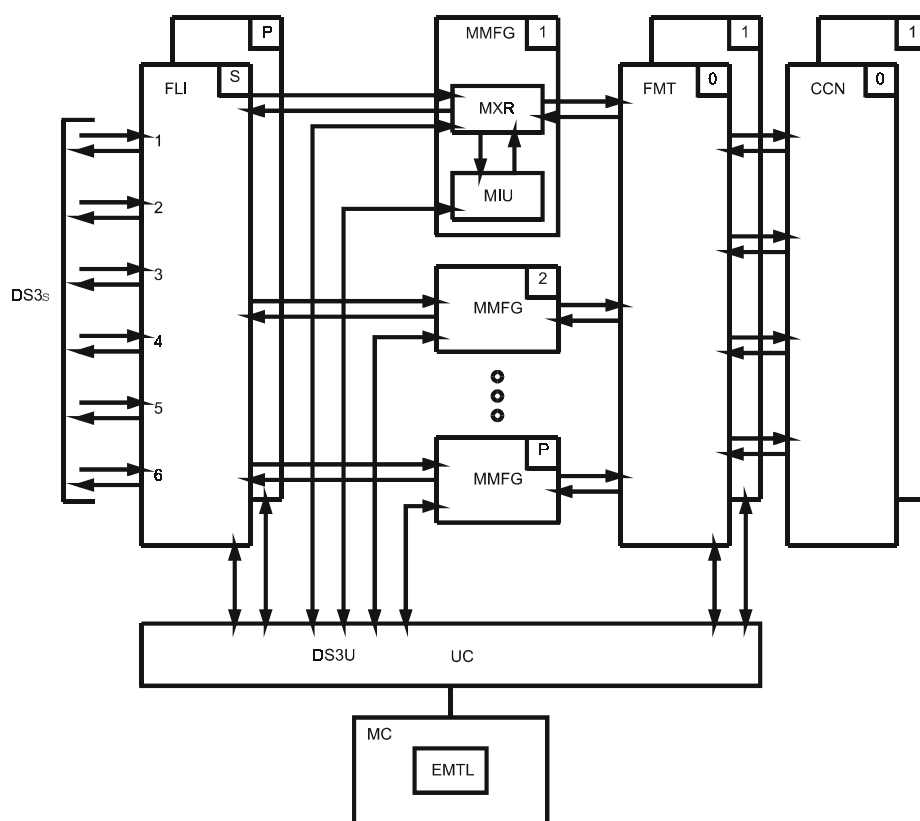


**Figure 1-34. Simplified DS3U Block Diagram**

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## DS3 Termination Feature (Continued)

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### Circuit Packs, Continued

#### FLI Pack

This pack terminates up to six DS3 coaxial lines for connection to the MXR positions in the DS3U. In addition to the signal termination that involves both impedance matching and signal level equalization, the FLI also:

- Performs bipolar/unipolar signal conversions
- Recovers DS3 line clock signal for MXR demultiplexing functions
- Accomplishes DS3 signal loopback on an out-of-service MXR when the pack is diagnosed.

Two FLI packs are provided in the DS3U 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 FMT packs) also accomplish the MXR protection switching on the line side of the MMFG packs. If any of the six MMFGs fails, the FLIs and FMTs simultaneously switch DS3 data to the protection MMFG. For additional information on the operation of the protection groups in the DS3U, refer to the DS3 Protection Switching section. Circuitry in the two FLIs maintains 75-ohm line impedance whether one or both of the unit FLIs are present.

#### MXR Pack

Figure 1-35 shows an expanded block diagram of the data flow through the M13 and M10 muldemers in the MXR pack. At the FLI interface on the pack, the MXR 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 which are applied to the 28 PCM transceivers in the M10 muldem. Each transceiver reformats the 24-channel data and signaling and the facility data link (FDL) 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.

The channel controller multiplexes the two 4.096-Mb/s signals into a single 64-channel 8.192-Mb/s serial stream. The FMT 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 FMT packs. The 28 PCM transceivers correspond to 28 NPC positions in the MXR that are provisioned by DACS II commands.

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## DS3 Termination Feature (Continued)

### Circuit Packs, Continued

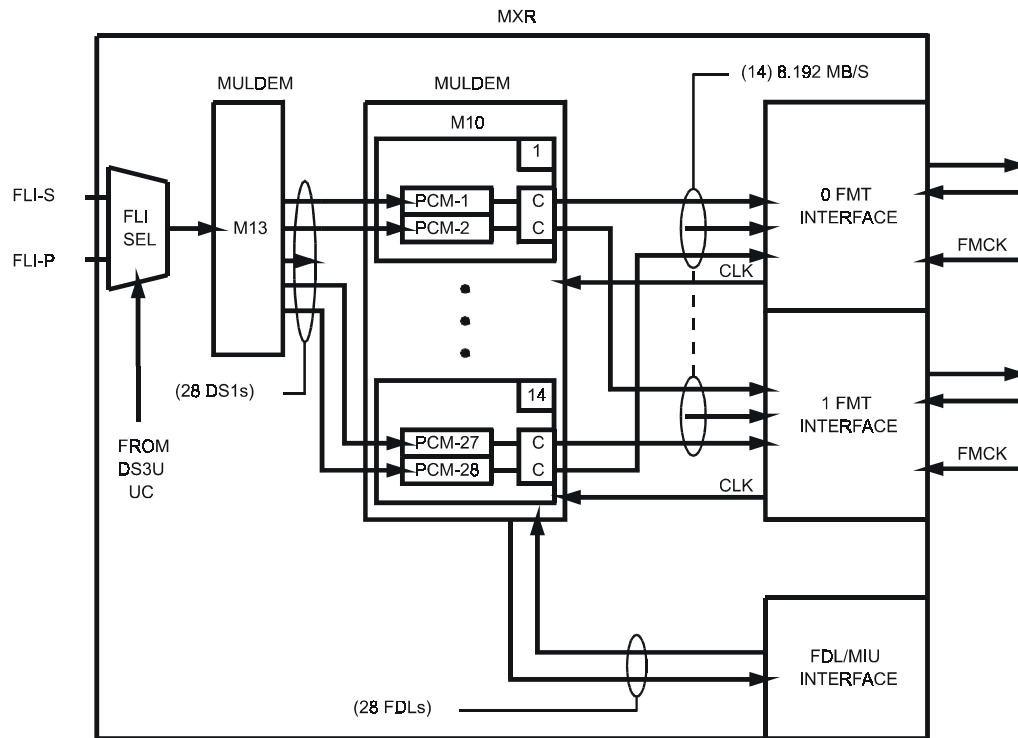


**Figure 1-35. Simplified MXR Block Diagram**

In the direction of transmission from the CCN, the MXR performs the reverse functions to produce one DS3 signal from the DS0 channels delivered by the CCN. The DS0 channels received from the FMT 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. Signals are received from both FMT packs, and 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 28 DS1s 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 buffers for storage and the circuitry for bit stuffing to accomplish the mux/demux functions.

(Continued on next page)

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## **DS3 Termination Feature (Continued)**

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### **Circuit Packs, Continued**

#### **FMT Pack**

The formatter pack contains MXR interface circuitry, four receive formatters feeding the CCN, four transmit formatters from the CCN, a clock generator, and DS3U 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 MXR pack. Circuitry for 2:1 selection of the 16.384-Mb/s signals from the service or protection MXR packs accomplish protection switching of the MXR pack on the CCN side. Each of the four receive formatters takes signals from the MXR interface circuitry (of 1-1/2 MXR 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 FTU or DSPU units in the frame. The four CCN ports are 1024 time-slot, 8.192-Mb/s ports. Only 1008 slots out of the 1024 slots contain DS0 channel information from the DS3 signal.

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 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 MXRs. The selected signals are converted by the MXR interface circuitry that produces the seven 16.384-Mb/s signals for the MXR packs.

There are two FMTs in the DS3U, 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 FMT pack. The FMT is switched with the CCN side which means that its failure causes the CCN side to switch and that the FMT switching follows the CCN switching (initiated by other causes). The clock generator in the FMT produces a local frame sync and an 8.192-MHz clock. These signals are distributed from the FMT on each CCN side to the six service MXRs and one protection MXR in the unit. The MXR selects the timing signals from the active FMT and in turn produces a 44.736-MHz clock that is used for timing the MXR's DS3 output signal.

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## DS3 Termination Feature (Continued)

### Protection Switching

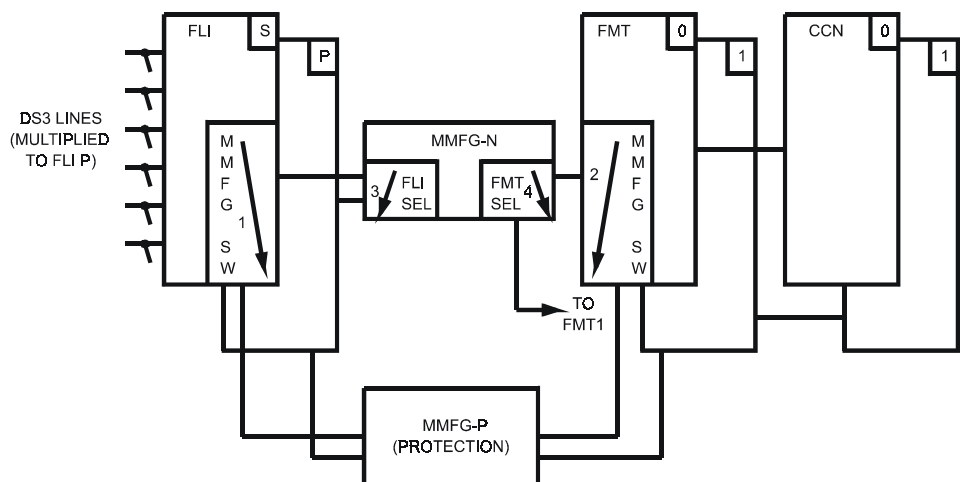
### Description

Since one DS3 signal contains 28 DS1 signals, protection switching is provided in the DS3U to prevent the loss of service owing to the failure of any single circuit pack in the DS3U. This switching is for a failure of any Multiplexer - Multiplexer Interface Unit pair; there is neither a spare DS3 facility nor DS3 facility switching.

The strategy of protection switching is implemented by having the following protection groups:

- The FLIs (1:1 protection)
- The MMFG (MXR) group (1:6 protection)
- The FMTs (1:1 protection)
- The power units.

The first three failure groups are described in this section. Figure 1-36 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 DS3U are diode OR'd together to supply the DS3U although only two are required for the load.



NOTE: SWITCH CONNECTIONS 1 AND 2  
REQUIRED FOR MMFG SWITCHING

**Figure 1-36. Protection Switching Circuitry**

(Continued on next page)



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## **DS3 Termination Feature (Continued)**

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### **Protection Switching, Continued**

#### **FLI Protection Switching**

The FLI protection switching maintains service if one of the FLI packs fails in the DS3U. This switching is accomplished by relays in the FLI packs and switching circuitry in the MXR packs. The switching is so fast that the transmission may only perceive a framing error.

This switching is under control of the DS3U 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.

#### **MMFG Protection Switching**

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 MXR 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 MXR in the FLI and FMT packs.

To accomplish this switching, the DS3U UC coordinates the switching operations on these packs and loads provisioning into the protection MXR to match that of the MXR to be switched out. The overall operation is managed by a fail-safe, lock-and-key mechanism administered by the DS3U 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 FMT packs are failed. However, the procedure also prevents a failed UC from falsely initiating a switch. The MXR switching is so fast that the transmission may only perceive a framing error.

#### **FMT Protection Switching**

The FMT protection switching maintains service if one of the FMT packs fails in the DS3U. The 0-side and 1-side FMT 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).

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## Hybrid DS3 Termination Feature

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### Description

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.

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### Capacity

A DS2 signal may also carry three E1 signals of rate 2.048 Mb/s. 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.

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## DS3 Hybrid Termination Feature (Continued)

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### Circuit Packs

#### Overview

As for the non-hybrid DS3U, Figure 1-34 shows a simplified block diagram of the DS3U/HDS3U 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 muldems (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.

#### 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:

- Performs bipolar/unipolar signal conversions
- Recovers DS3 line clock signal for HMXR demultiplexing functions
- 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.

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## DS3 Hybrid Termination Feature (Continued)

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### Circuit Packs, Continued

#### HMXR Pack

Figure 1-35 shows an expanded block diagram of the data flow through the M13 and M10 muldem 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.

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. 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.

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## **DS3 Hybrid Termination Feature (Continued)**

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### **Circuit Packs, Continued**

#### **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.

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## DS3 Hybrid Termination Feature (Continued)

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### Protection Switching

#### Description

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 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)
- The power units.

The first three failure groups are described in this section. Figure 1-36 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.

#### FLI Protection Switching

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.

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## **DS3 Hybrid Termination Feature (Continued)**

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### **Protection Switching, Continued**

#### **MMFG Protection Switching**

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.

#### **HFMT Protection Switching**

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).

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## DS3 Hybrid Termination Feature (Continued)

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### Performance Monitoring

In Hybrid DS3 performance monitoring, only the performance data on Hybrid DS3 circuits will be reported. There is no alarm capability based on certain performance parameters exceeding a certain threshold.

DACS II will save 15 additional most recent 15-minute values and 7 daily values for all performance parameters, giving a total of 4 hrs of 15-min counts and one week's worth of daily counts.

When a protection switch of an HMXR is completed (from service to protection HMXR, or protection to service HMXR), all DS3 performance parameter registers are initialized to 0, discarding all collected data.

---

### Threshold Support

With the threshold support feature, the DACS II is capable of:

- Allowing users to set up four separate threshold values (including the default threshold value) for each performance monitoring parameter
- Detecting threshold crossings for each of the daily and 15-minute parameters
- Issuing a threshold crossing message when a threshold crossing occurs.

For convenience, threshold crossings and their associated alarm messages can be suppressed (turned off).

---

### Remote Alarm Indication

Remote Alarm Indication (RAI) informs the DACS II when the Far End is in alarm. The multiframe's X-bits are used as the RAI flag bits. Both X-bits (X1 and X2) must always be set to the same value.

Additionally, this feature supports the reversal of the X-bit values to support a Samsung multiplexer in Korea that interprets the X-bits in the opposite way as the ANSI standard requires it. This function is an option that the user is able to specify.

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## DS3 Hybrid Termination Feature (Continued)

### Remote Alarm Indication, Continued

#### Multiplexer Type HX100

When a HMXR detects an LOS, OOF, BER, or AIS on its incoming DS3, then it will change the values of the two X-bits from "0" to "1" (See Figure 1-37). The X-bits will be limited to at most one change per second; one second must elapse before the X-bits can be changed again.

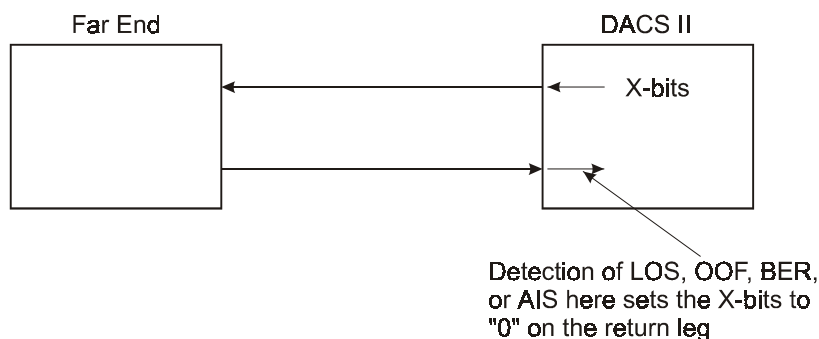


**Figure 1-37. Remote Alarm Indication**

If the incoming DS3 signal is good, then the HMXR will monitor the X-bits. If the X-bits change from "0" to "1," the HMXR will issue a major alarm for that DS3. The alarm integration time value that currently applies to other DS3 alarms also applies to this alarm.

If the X-bits change from "1" to "0," the HMXR will idle the RAI critical alarm for that DS3. The idle alarm integration time value that currently applies to the DS3 alarm idles also applies to this alarm idle.

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## DS3 Hybrid Termination Feature (Continued)

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### Remote Alarm Indication, Continued

#### Multiplexer Type HX110

The HX110 multiplexer type will behave exactly like the HX100 type, except the meaning of the X-bits is reversed. "1" means no problem at the Far End; "0" means there is a problem at the far end receiving the DS3 signal. This NPC Type will accommodate the multiplexers that don't adhere to the standard.

---

### Alarm Activate Integration Time

The alarm activate integration time is the duration between a DS3 LOS/OOF/AIS/IDLE/BER alarm and the display of its corresponding alarm message. Previously, this time was set to 10 seconds. The alarm integration time for DS3 signals on both regular DS3 and Hybrid DS3 facilities may be set to a value between 2 and 10 seconds. The default will still be 10 seconds.

The customer should be careful not to set this value too short. If alarm oscillations occur with alarm durations slightly longer than the timer setting, then a large number of alarm messages will be generated, which may be undesirable.

---

## DSP Platform Feature

### Description

The Digital Signal Processing (DSP) Platform is an operating system interface that allows particular features to be developed as applications. Software that runs on the DSP application circuit pack is called application software because it is treated by the DACS II as a separate and distinct application interacting with the DACS II generic software.

### Connections

The DSP application runs on the TG193B circuit pack, which fits into any slot that an EDDC or EDCP card fits into. Channels on the DSP application card may be cross-connected to channels on facility terminating NPCs, as shown in Figure 1-38.

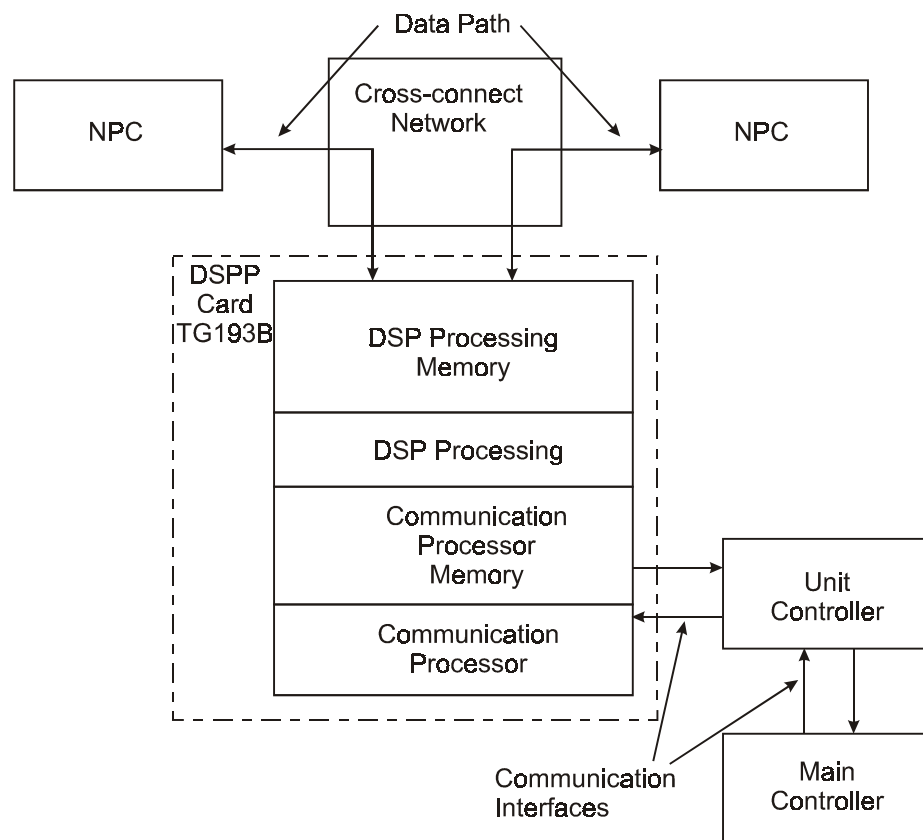


**Figure 1-38. Basic DSP Platform Hardware Architecture**

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## DSP Platform Feature (Continued)

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### DSP Processing

Data flows from the cross-connect network (CCN) into the DSP processing memory of the card. The DSP Processor, under control of the DSP memory, can manipulate the data. After manipulation, the data flows from the DSP processing memory back to the CCN.

The DSP Processing is controlled by a Communication Processor through the Communication Processor Memory. The Communication Processor communicates with the Unit Controller and the Main Controller of the DACS II through the Communication Interface (CI).

---

### DSP Applications

Applications for the DSP application circuit packs are packaged and shipped as separately orderable software releases on PCMCIA cards. Documentation for the individual application is also separate from regular DACS II documentation and is shipped together with the PCMCIA cards containing that application.

The following three applications are currently supported:

- X.50/X.57 Subrate Application (international market)
    - Cross-connections and test access for Digital Data Networks (DDNs) that use the X.50/X.57 standard to support the following data rates: 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, and 19.2 kbit/s. The 1.2 kbit/s rate is supported as a 2.4 kbit/s subrate circuit in "stuffed mode." The 19.2 kbit/s data rate is supported as two 9.6 kbit/s circuits.
  - DDS Subrate and Multipoint Junction Unit (MJU) Application (North American market), which introduces the following:
    - Subrate multiplexing and MJU capability at the 19.2 kbit/s data rate
    - An anti-streaming feature for MJU circuits.
  - Digital Multipoint Bridge (DMB) Application
    - Allows a limited number of DMB cross-connections on the DACS II without provisioning a DSPU.
-

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## DSP Platform Feature (Continued)

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### Time Slots

On a facility terminating module provisioned for international service, the time slot numbers are designated from 1-64. On a facility terminating module provisioned for North American service, the time slot numbers are designated from 1-63; excluding the time slots that are divisible by 4. Therefore, only 48 time slots are available for DSP application cards provisioned for North American service.

When input commands are passed through the DSP application, they must still adhere to the NPC addressing that is being used on the frame. The application retrieves the correct NPC addressing scheme from the DACS II.

---

### Supported Cross-connection Types

All channels of facility terminating NPCs and application NPCs may be cross-connected to particular application NPCs except for the following:

1. SD111 (X.50/X.57 International Subrate application)
  - NPCs that carry clear unchannelized DS1 or E1 signals
  - Channels 0 and 31 on a 2 Mbit/s facility provisioned with CAS
  - Channel 0 on a 2 Mbit/s facility provisioned with NSA
  - Channel 24 of a DA type NPC grown with T1DM framing
  - Channel 24 of a DA type NPC grown with the DMI signaling option
  - Channels on an SP type NPC
  - Channels on an SD311 application.
2. SD311 (Digital Multipoint Bridge application)
  - NPCs that carry clear unchannelized DS1 or E1 signals
  - Channels 0 and 31 on a 2 Mbit/s facility provisioned with CAS
  - Channel 0 on a 2 Mbit/s facility provisioned with NSA
  - Channel 24 of a DA type NPC grown with T1DM framing
  - Channel 24 of a DA type NPC grown with the DMI signaling option
  - Channels on an SP type NPC
  - Channels on an SD111 application
  - Channels on an SD411 application.

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## DSP Platform Feature (Continued)

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### Supported Cross-connection Types, Continued

3. SD411 (DDS Subrate and MJU application)
    - NPCs that carry clear unchannelized DS1 or E1 signals
    - Channels 0 and 31 on a 2 Mbit/s facility provisioned with CAS
    - Channel 0 on a 2 Mbit/s facility provisioned with NSA
    - Channel 24 of a DA type NPC grown with T1DM framing
    - Channel 24 of a DA type NPC grown with the DMI signaling option
    - Channels on an SP type NPC
    - Channels on an SD311 application.
- 

### DSP Application Card Error Recovery

The DACS II generic software analyzes the appropriate error summary registers of the DSP application card when interrupts are received from the card. After this analysis, if interrupts are received, the error recovery process initiates actions, such as:

- Alarm report
- Soft reset
- Card removal.

If an internal error is detected by the DSP application card, it can send a report to the error recovery service to request one of the following actions:

- Soft reset of the card (database re-download)
- Hard reset of the card (application card initialization and re-download)
- Removal of card
- Report of errors
- Log only.

The error recovery service maintains an audit trail for all application cards. If necessary, it will remove a card from service if repeated attempts of the same action do not resolve the problem on the card.

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## DSP Platform Feature (Continued)

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### Test Access

Test access does not monitor any connections inside a Digital Signal Processing (DSP) Platform application, such as the DDS Substrate an MJU application, the X.50/X.57 Substrate application, or the DMB application. However, test ports may be established to the DDS Substrate and MJU and DMB applications only via application commands to monitor or split circuits within the application.

If a test port has been established to an application, then that test port will always appear as a split connection in an invocation of the **RTRV-TACC-T1** command, regardless of whether that test port is in monitor, split, or release mode inside the application.

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## Understanding Commands and Messages

### Overview

This section is intended to provide the reader with the following information:

- Creating input messages
  - Decoding output messages
  - Description of NPC Addressing
  - Tips on using the On-Line help to create input messages.
- 

## Commands and Messages

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### Overview

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.

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## Commands and Messages (Continued)

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### DACS II Administrative Links

#### Local and Remote Link Connections

DACS II can be administered (managed, operated) from a local terminal or remotely from an OS (Operations System) connected via an administrative link. Six administrative links (ports) can be used.

#### Message Screening

A level of message screening can be assigned to each link. A user may choose to always receive an output message to his/her input 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.

#### Link Usages

Some uses of an administrative link are as follows:

- DS0 channel and clear-DS1 signal cross-connections and test access
- Subrate data feature cross-connections
- Common equipment and feature equipment provisioning and maintenance
- Equipment and channel status information
- DS1 and DS3 facility provisioning and maintenance
- DS1 and DS3 facility performance readings
- DS3 facility alarm surveillance and control (AS&C) and DS3 performance monitoring using telemetry asynchronous block serial (TABS) protocol.

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## Commands and Messages (Continued)

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### DACS II Administrative Links, Continued

#### Output Messages

Administrative links carry output messages 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 a change in the DACS II system operation state which includes alarms and other trouble indications. This type of output message is referred to as an *autonomous response*.

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## **Commands and Messages (Continued)**

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### **Protocols**

The link protocols used on the ICI (TM782) circuit pack are:

- SNIDER - used on Links 1, 2, 3, and 4
  - X.25 - used on Links 5 and 6
  - TCP/IP (TELNET) - used on Link 7.
- 

### **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.

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### **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.

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## Commands and Messages (Continued)

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### 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

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.*

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## Commands and Messages (Continued)

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### Using the Commands, Continued

#### Characters in an Input Command

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 (!) A semicolon (;) 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.

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## Commands and Messages (Continued)

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### Issuing Commands to a DSP Platform Application

#### Prefix Notation

Commands that are issued to a DSP application use a prefix notation that allows DACS II to:

- Recognize the command as an application command
- Transmit the command to the application.

Parsing of an application command is done by the application itself on the TG193B circuit pack. The following notation is used to issue an application command:

[I.14901] **EXC-DSPC::<npc No.>::<mml\_application command>!**

where **<npc no.>** is the NPC number (non-hierarchical and hierarchical, respectively) of the application to be addressed.

#### Commands for Individual Applications

Commands for an individual application are documented separately for each application. The user should refer to this application documentation for a detailed description of individual application commands.

Utility commands for an individual application may be issued to all circuit packs in the frame that run that application by issuing the following variation of the previous command:

[I.14901] **EXC-DSPC::SDxyz::<mml\_application command>!**

where **SDxyz** is the type designation for the particular application.

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## Commands and Messages (Continued)

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### Issuing Commands to a DSP Platform Application, Continued

#### Supported Application Types

The following application types are currently supported:

- SD111 - X.50/X.57 International Subrate application (only MML is supported)
  - SD311 - Digital Multipoint Bridge (DMB) application
  - SD411 - DDS Subrate and Multipoint Junction Unit application.
- 

### Aborting an Input Command or Output Message

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

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## Commands and Messages (Continued)

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### Input Command Format

#### General Format

The general format of an input command is:

**VERB** [ -MODIFIER ] [ -MODIFIER ] : [ xy ] : [ zz ] : [ ww ] : [ d ] [ , e ] . . . [ , z ] ;

#### Explanation of Parameters and Delimiters

Brackets [ ] enclose modifiers, parameters, and optional information. Parameters give the specific information required by the command verb in order to execute that command. All parameters are positional within the command line.

: [ xy ] : [ zz ] : [ ww ] : [ d ] [ , e ] . . . [ , z ] ; represent the input parameters and are separated by colons, but if they are logically connected (also called group, block, field), they are separated by commas. The colon (:) is used as a parameter field delimiter.

Input commands are terminated with the semicolon (;) or a carriage return. If the carriage return is used, ; is echoed back to the terminal.

#### Parameter Rules

Input commands must be treated on a case-by-case basis. For example:

- If a parameter field has only a single value (letter or number), it is considered a keyword-defined parameter field.
- A keyword-defined parameter is not positioned inside the parameter field and the comma (,) is omitted. A double comma (,,) in any keyword-defined parameter field will be rejected.
- A value- (letter or number) defined parameter is positional inside a parameter block.

#### Example of an Input Command

**RST-EQPT::05::12:NPC 097; PF**

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

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## Commands and Messages (Continued)

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### Keywords

### Description

Input commands consist of *keywords* combined with equipment and circuit identification.

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

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

### Entity Identification

*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

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

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## Commands and Messages (Continued)

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### Verbs

The general format of an input command is shown below with the various command keywords described in some detail:

**VERB** [ **-MODIFIER** ] [ **-MODIFIER** ] : [ **TID** ] : [ **EID** ] : [ **CTAG** ] : \  
**DATA PARAMETER BLOCKS**;

**VERB** is the command verb specifying what action the system is to perform: connect, audit, diagnose, etc. A *command verb* (also called an action verb) is sometimes in mnemonic form.

A verb can be followed by no **modifier**, one **-modifier**, or two **-modifiers** (each preceded by a hyphen). These modifiers represent the equipment and circuit identification and identify the physical entity within the frame or the data base entity upon which action is taken.

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(Continued on next page)

## Commands and Messages (Continued)

### Verbs, Continued

Table 1-4 lists verbs, keywords, and modifiers.

**Table 1-4. Verb/Keyword and/or Modifier(s)**

| Verb/Keyword             | Meaning                                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>ABT - CMD</b>         | Abort or terminate a previous input command that has not completed its execution.                                                   |
| <b>ABT - PROC</b>        | Abort or terminate a currently active process or macro.                                                                             |
| <b>ALW - LPBK</b>        | Allow loopback or inhibit automatic switch protection.                                                                              |
| <b>ALW - SW</b>          | Allow switching or automatic switch protection.                                                                                     |
| <b>CHG - LGN</b>         | Change password and/or user identification code.                                                                                    |
| <b>CHG - RPATH - T0</b>  | Change the return path for the digroups and ranges beginning with the initial channels given in the TOX argument list.              |
| <b>CHG - TACC - T0</b>   | Change the modes of a test session under a specified test port.                                                                     |
| <b>CHG - TL - T0</b>     | Change the modes of a terminate and leave state of a circuit(s).                                                                    |
| <b>CONN - BDCST - T0</b> | Connect a broadcast cross-connection (from source NPC) to a multiple number of other terminations in one direction of transmission. |
| <b>CONN - CRS1 - T0</b>  | Connect a one-way cross-connect circuit or a range of one-way circuits.                                                             |
| <b>CONN - CRS - T0</b>   | Connect a two-way cross-connect circuit or a range of two-way circuits.                                                             |
| <b>CONN - HUB - T0</b>   | Connect a hubbing mode test access via test port kk with trunk conditioning to the T0 termination.                                  |
| <b>CONN - TACC - T0</b>  | Connect a monitor connection between a digroup (designated T0) and a test port (designated TP).                                     |
| <b>CPY - MEM</b>         | Copy data from one memory to another, such as PMEM to SMEM or RAM (WKG).                                                            |
| <b>CRTE - CNFGRN</b>     | Create connectivity in the system data base.                                                                                        |
| <b>CRTE - CRS</b>        | Create cross-connections in the cross-connect network.                                                                              |
| <b>CRTE - EQPT</b>       | Create equipment entities in the system data base.                                                                                  |

**Table 1-4. Verb/Keyword and/or Modifier(s) (Continued)**

| <b>Verb/Keyword</b>       | <b>Meaning</b>                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CRTE - LGN</b>         | Create or add a new user to the system.                                                                                                                                                                                                                                                                                                                              |
| <b>DGN - EQPT</b>         | Diagnose equipment at the user's request and report details. Equipment such as cross-connect buffer (CCB), cross-connect network interface (CCNI), communications interface (CI/ICI), link number (LINK), main controller (MC), main processor (MP), network processing circuit (NPC), synchronizer (SYNC), time slot interchange (TSI), and FTU, DSPC, or DS3 unit. |
| <b>DISC - BDCST - T0</b>  | Disconnect a broadcast connection (from source NPC) to a multiple number of other terminations in one direction of transmission.                                                                                                                                                                                                                                     |
| <b>DISC - CRS - T0</b>    | Disconnect a two-way cross-connect circuit or a range of two-way circuits.                                                                                                                                                                                                                                                                                           |
| <b>DISC - CRS1 - T0</b>   | Disconnect a one-way cross-connect circuit or a range of one-way circuits.                                                                                                                                                                                                                                                                                           |
| <b>DISC - EQPT</b>        | Disconnect (degrowth) equipment, multiple interface units, and/or multiplexers.                                                                                                                                                                                                                                                                                      |
| <b>DISC - TACC - T0</b>   | Disconnect a test access session under a specified test port and restore the original cross-connection.                                                                                                                                                                                                                                                              |
| <b>DLT - CRS</b>          | Delete a cross-connection from the system data base.                                                                                                                                                                                                                                                                                                                 |
| <b>DLT - FPKG</b>         | Delete a feature package from the system data base.                                                                                                                                                                                                                                                                                                                  |
| <b>DLT - LGN</b>          | Delete a password and user identification code. Only the superuser can invoke this command.                                                                                                                                                                                                                                                                          |
| <b>DLT - MACRO, MAP</b>   | Delete a macro or map.                                                                                                                                                                                                                                                                                                                                               |
| <b>DLT - PRMTR</b>        | Delete a parameter from the system data base.                                                                                                                                                                                                                                                                                                                        |
| <b>ED - CNFGRN - EQPT</b> | Edit the current connectivity and entity state of a specified equipment unit.                                                                                                                                                                                                                                                                                        |
| <b>ED - CONN</b>          | Edit a connection.                                                                                                                                                                                                                                                                                                                                                   |
| <b>ED - CRTE</b>          | Edit a create activity.                                                                                                                                                                                                                                                                                                                                              |
| <b>ED - DATE</b>          | Edit the system date and time clock.                                                                                                                                                                                                                                                                                                                                 |
| <b>ED - ADD - MAP</b>     | Enter NPCs into the map.                                                                                                                                                                                                                                                                                                                                             |
| <b>ED - DLT - MAP</b>     | Delete NPCs from the map.                                                                                                                                                                                                                                                                                                                                            |

**Table 1-4. Verb/Keyword and/or Modifier(s) (Continued)**

| <b>Verb/Keyword</b>             | <b>Meaning</b>                                                                                                                                                                                                                                      |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ED - OPT - T1</b>            | Edit the programmable thresholds for the facility performance parameters of an NPC.                                                                                                                                                                 |
| <b>ED - PRMTR - EQPT</b>        | Modify the provisioning information associated with equipment.                                                                                                                                                                                      |
| <b>ED - PRMTR - LINK</b>        | Modify the provisioning information associated with user interface links.                                                                                                                                                                           |
| <b>ED - PRMTR - MAP , MACRO</b> | Modify the existing map or macro with new information.                                                                                                                                                                                              |
| <b>ED - PRMTR - NE</b>          | Modify the provisioning information associated with the DACS II network element.                                                                                                                                                                    |
| <b>ED - PRMTR - T0</b>          | Modify the provisioning information associated with digroup.                                                                                                                                                                                        |
| <b>ED - STATE - EQPT</b>        | Edit the maintenance state of equipment in ways other than via a remove or restore function.                                                                                                                                                        |
| <b>ENT - EQPT</b>               | Manually provision equipment entities (those that are not automatically provisioned).                                                                                                                                                               |
| <b>ENT - MACRO , MAP</b>        | Manually create the open session of an alternate map or a macro.                                                                                                                                                                                    |
| <b>EXC - MACRO , MAP</b>        | Execute the existing map or macro.                                                                                                                                                                                                                  |
| <b>INH - LPBK</b>               | Inhibit an automatic loopback switch protection.                                                                                                                                                                                                    |
| <b>INH - SW</b>                 | Inhibit an automatic switch protection.                                                                                                                                                                                                             |
| <b>INIT - LOG</b>               | Initialize the ERR log file.                                                                                                                                                                                                                        |
| <b>INIT - REG</b>               | Initialize the DACS II registers.                                                                                                                                                                                                                   |
| <b>INIT - SYS</b>               | Initialize the DACS II processor system.                                                                                                                                                                                                            |
| <b>LGN - USER</b>               | Allow the user to identify himself/herself to the system with his/her <id>.                                                                                                                                                                         |
| <b>LGT - USER</b>               | Allow the user to logoff from the system.                                                                                                                                                                                                           |
| <b>OPR - ACO - ALL</b>          | Cut off the office audible alarm indications without changing the local alarm indications. This function does not clear other alarm indicators and does not disable future alarms from sounding audibles (so a release ACO function is not needed). |

**Table 1-4. Verb/Keyword and/or Modifier(s) (Continued)**

| <b>Verb/Keyword</b>         | <b>Meaning</b>                                                                                               |
|-----------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>OPR - LPBK - T0</b>      | Request a loopback on a specified equipment unit or facility in the system.                                  |
| <b>RLS - LPBK - T1</b>      | Release the 1.544 Mb/s loopback.                                                                             |
| <b>REPT - ALM - EQPT</b>    | Report alarms associated with equipment failures.                                                            |
| <b>REPT - ALMDET - EQPT</b> | Supplement the information about the trouble generated by the <b>REPT - ALM</b> .                            |
| <b>REPT - ALM - T0</b>      | Report alarms associated with DS0 facility failures.                                                         |
| <b>REPT - CMPR - MEM</b>    | Report frame audit memory comparison mismatches.                                                             |
| <b>REPT - DGN - EQPT</b>    | Report the results of diagnostic routines that have been initiated autonomously by the system.               |
| <b>REPT - EVT - EQPT</b>    | Report events which do not require alarm notifications but indicate the maintenance condition of the system. |
| <b>REPT - RMV - EQPT</b>    | Report the autonomous removal of equipment from service.                                                     |
| <b>REPT - RST - EQPT</b>    | Report the autonomous restoral of equipment to service.                                                      |
| <b>REPT - SW - EQPT</b>     | Report the autonomous switch of an entity to protection (auto-removal) or to working (auto-restoration).     |
| <b>RMV - CNFGRN</b>         | Remove connectivity equipment from service.                                                                  |
| <b>RMV - EQPT</b>           | Remove equipment from service.                                                                               |
| <b>RMV - LINK</b>           | Remove a user interface link from service.                                                                   |
| <b>RST - CNFGRN</b>         | Restore connectivity equipment to service.                                                                   |
| <b>RST - EQPT</b>           | Restore equipment to service.                                                                                |
| <b>RST - PASSWD</b>         | Restore or recover the frame administrator password.                                                         |
| <b>RST - LINK</b>           | Restore a user interface link to service.                                                                    |
| <b>RTRV - ALM - EQPT</b>    | Retrieve the current status of all automatically-reported equipment indicators (alarm or status).            |
| <b>RTRV - ALM - NE</b>      | Retrieve the current alarm state of the DACS II network element.                                             |
| <b>RTRV - ALM - T0</b>      | Retrieve the current status of all automatically-reported digroup indicators (alarm or status).              |
| <b>RTRV - BDCST - T0</b>    | Retrieve the cross-connect map for a single NPC or a range of NPCs.                                          |

**Table 1-4. Verb/Keyword and/or Modifier(s) (Continued)**

| <b>Verb/Keyword</b>              | <b>Meaning</b>                                                                                       |
|----------------------------------|------------------------------------------------------------------------------------------------------|
| <b>RTRV - BKUP - SCHED</b>       | Retrieve the scheduled autonomous backup from a primary memory to a local nonvolatile backup memory. |
| <b>RTRV - COND - EQPT</b>        | Retrieve condition types associated with equipment indicators (alarm or status).                     |
| <b>RTRV - COND - T0</b>          | Retrieve condition types associated with NPC indicators (alarm or status).                           |
| <b>RTRV - CNFGRN - EQPT</b>      | Retrieve the current connectivity and entity state of a specified equipment unit.                    |
| <b>RTRV - CRS - T1</b>           | Retrieve the cross-connect map information associated with NPCs.                                     |
| <b>RTRV - HDR</b>                | Retrieve the header information associated with the DACS II network element.                         |
| <b>RTRV - LOC - EQPT</b>         | Retrieve a physical location of a circuit pack entity.                                               |
| <b>RTRV - LOG</b>                | Request to dump the contents of the log file.                                                        |
| <b>RTRV - MAP - COM, EQPT</b>    | Query the map.                                                                                       |
| <b>RTRV - MACRO - COM</b>        | Query the macro.                                                                                     |
| <b>RTRV - OPT - T1</b>           | Retrieve the option (threshold) value for parameter.                                                 |
| <b>RTRV - PRMTR - EQPT</b>       | Retrieve the provisioning information and service data associated with equipment.                    |
| <b>RTRV - PRMTR - LINK</b>       | Retrieve provisioning information and service data associated with user interface links.             |
| <b>RTRV - PRMTR - MACRO, MAP</b> | Retrieve information of the components associated with the macro or map.                             |
| <b>RTRV - PRMTR - NE</b>         | Retrieve provisioning information and service data associated with the network element.              |
| <b>RTRV - PRMTR - T0</b>         | Retrieve the provisioning information and service data associated with NPC channels.                 |
| <b>RTRV - PRVG - USER   LINK</b> | Retrieve privilege parameters associated with login users or link.                                   |
| <b>RTRV - RECOVY - EQPT</b>      | Retrieve information of the error source register (ESR) for a specific processor.                    |

**Table 1-4. Verb/Keyword and/or Modifier(s) (Continued)**

| <b>Verb/Keyword</b>         | <b>Meaning</b>                                                                      |
|-----------------------------|-------------------------------------------------------------------------------------|
| <b>RTRV-REG-EQPT</b>        | Retrieve information of the error source register (ESR) for the main processor.     |
| <b>RTRV-STATE-COM</b>       | Retrieve the common information associated with equipment (such as TLIs and SYNCs). |
| <b>RTRV-STATE-EQPT</b>      | Retrieve the state information associated with equipment.                           |
| <b>RTRV-STATE-T0</b>        | Retrieve the state information associated with NPCs.                                |
| <b>RTRV-TACC-T1</b>         | Retrieve information about all test access activity of the test port.               |
| <b>RTRV-TACC-T0</b>         | Retrieve information about all test access activity in the system.                  |
| <b>SCHED-BKUP-MEM</b>       | Schedule an autonomous backup from a primary memory to a local nonvolatile memory.  |
| <b>SCHED-PMREPT-ALL</b>     | Schedule an autonomous midnight performance monitoring report.                      |
| <b>SET-ATTR-EQPT</b>        | Set the attributes that are associated with a specified event.                      |
| <b>SET-PRVG-USER   TERM</b> | Assign user or link privilege for input prioritization and output screening.        |
| <b>STA-LOCL-RST</b>         | Transfer the database from PMEM to RAM or from SMEM to RAM.                         |
| <b>SW-DX-EQPT</b>           | Request all digroup circuits to select data and clocks from cross-connect side A.   |



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## Commands and Messages (Continued)

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### Addressing Levels    Overview

There are two different levels of addressing that occurs in commands:

- First level - The target identification (TID)
- Second level - The entity identification (EID).

#### Target Identification (TID)

The TID uniquely identifies the target as DACS II. An 11-character CLLI\* code is the recommended value for the TID. If the CLLI code for a DACS II is not unique, the CLLI code can be augmented with additional characters (letters, digits, and hyphens) for a total of 20 characters. The TID is used only in applications of indirect routing. If direct routing exists between the user and the DACS II frame, the TID is not necessary. If a TID is incorrectly entered, whether it is required or not, the entire command will be denied.

#### Entity Identification (EID)

The EID identifies the particular entity within the DACS II frame and is composed of an equipment part and a facility part.

- Equipment

The format of the equipment part consists of PHYSICAL-{UNIT number}-{NUMBER}. The PHYSICAL description is a UNIT, MC, PWR, FTMI, etc., and, if necessary, a hierarchic logical address may be appended to it. Therefore, the equipment part may be a combination of the physical description and the logical address. UNIT number defines where the equipment (unit) exists. There can be up to six units in a 512 primary block circuit DACS II. NUMBER is the range or count of different entities that can exist in a unit. If the range is one for NUMBER, it will be "null" in the address.

- Facility

In this manual, the double and triple ampersand (&&,&&&) define a sequence of consecutive simple parameter arguments. It is possible to indicate the arguments by writing the lower and upper simple parameter arguments separated by && or &&&.

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## Commands and Messages (Continued)

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### Input Command Control Characters

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

- **CONTROL-x** or **CTRL-x**. *Abandon message.* Depressing the CONTROL and the x keys simultaneously 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.
-

## Commands and Messages (Continued)

### Input Command Acknowledgement

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. Additional Input Acknowledgements are listed in Table 1-5.

**Table 1-5. Additional Input Acknowledgements**

| <i>Acknowledgement</i> | <i>Meaning</i>                                                  |
|------------------------|-----------------------------------------------------------------|
| ?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. |

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## Commands and Messages (Continued)

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### Output Messages

### Description

There are three types of DACS II output messages:

- **Normal or Completion message**  
Indicates the input command from the user has been executed and completed.
- **Error response or Denial message**  
Indicates the input command has been denied and gives the reason or condition code for the denial.
- **Autonomous message**  
Reports a change in the operational state of the DACS II.

An output message consists of one or more segments. Each message segment is in the following format: a *header line* followed by a *primary line* which may be followed by one or more *secondary lines*.

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## Commands and Messages (Continued)

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### Output Messages, Continued

#### Header Line

The header line contains the following information:

- Target identifier (TID)

The target identifier is the code for a DACS II frame and consists of up to 20 ASCII characters in length.

- Date

The date is the current date presented in the format of **yy-mm-dd** (that is, year-month-day), where **yy** is the last two digits of the year, **mm** is the month, and **dd** is the day of the month.

- Time

The time is the current time of day in the format of **hh:mm:ss** (that is, hour:minute:second), where **hh** ranges from 00 to 23, and **mm** and **ss** range from 00 to 59.

- Link number.

The link number is the administrative link/virtual circuit number in the format of **LINK-l[mm]** (that is, LINK-<administrative link number>[<virtual circuit number>]), where **l** ranges from 1 to 6 and **mm** ranges from 01 to 16. An autonomous response does not contain the link number.

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(Continued on next page)

## Commands and Messages (Continued)

### Output Messages, Continued

#### Primary Line

The primary line contains the following information:

- Priority of action (PA)

The priority of action indicates the type of output message which could be either a response to an input command or an autonomous message generated by DACS II. The priority of action takes one of the following values in Table 1-6:

**Table 1-6. Priority of Action Levels**

| <b>Value</b> | <b>Meaning</b>                                         |
|--------------|--------------------------------------------------------|
| <b>*C</b>    | Immediate action, critical alarm (autonomous response) |
| <b>**</b>    | Immediate action, major alarm (autonomous response)    |
| <b>*^</b>    | Action, minor alarm (autonomous response)              |
| <b>M^</b>    | Result of manual action (response to an input command) |
| <b>A^</b>    | Autonomously generated message, not an alarm           |

Each caret ( ^ ) represents a space.

- Command code

The command code consists of the action verb and one or more possible modifiers.

- Entity identifier (EID)

- Correlation tag (CTAG)

In a normal or error response, the correlation tag is the same as that specified in the input command. The correlation tag in an autonomous response is generated by DACS II.

- Data parameters

The data parameters further specify the action performed on the entity.

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(Continued on next page)

## Commands and Messages (Continued)

### Output Messages, Continued

- Termination report.

The termination report indicates whether the input command is successfully completed or denied, and it takes on one of the following values in Table 1-7:

**Table 1-7. Command Termination Status**

| <i>Value</i>  | <i>Meaning</i>                       |
|---------------|--------------------------------------|
| <b>COMPLD</b> | Input command completed successfully |
| <b>DENY</b>   | Input command denied                 |

### Secondary Lines

The secondary lines contained in the output message are of two types:

- Free-format

The free-format secondary lines provide information for the user to understand the data contained in the fixed-format lines. The free-format secondary lines are enclosed by "/"\* and "\*" /."

- Fixed-format.

The fixed-format secondary lines contain data generated by DACS II and are arranged in a format so as to be parsed by a machine. The fixed-format secondary lines are enclosed by double quotes (").

### Output Message Segment

The header line is the same for each message segment except for the time and possibly the date. The primary line is exactly the same for all message segments.

A multisegmented output message uses the greater-than sign (>) and the semicolon (;) to terminate the message segments. The greater-than sign is the terminating character (the last printable character) for the first and all intermediate message segments. The semicolon terminates the final message segment. A message segment should be no larger than 4096 bytes.

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(Continued on next page)

## **Commands and Messages (Continued)**

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### **Output Messages, Continued**

#### **Normal Response**

A normal response reports a successfully completed input command. The general formats of this type of output message are shown below. Each caret (^) represents a space. The brackets [ ] are not part of the actual output message, except for those surrounding the output message number.

*Single-Segmented Normal Response Without Secondary Lines*

```
^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]  
M^^VERB[^MODIFIER][^MODIFIER]::[b]:[CTAG]:[d][,e]...[,z]^COMPLD  
;
```

*Single-Segmented Normal Response With Secondary Lines*

```
^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]  
M^^VERB[^MODIFIER][^MODIFIER]::[b]:[CTAG]:[d][,e]...[,z]^COMPLD  
^^^/*^[output message number]^*/  
^^^/*^free-format secondary line^*/  
^^^"fixed-format secondary line"  
;
```

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(Continued on next page)



## Commands and Messages (Continued)

### Output Messages, Continued *Multisegmented Normal Response*

```

^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]
M^^VERB[^MODIFIER][^MODIFIER]::[b]:[CTAG]:[d][,e]...[z]^COMPLD
^^^/*^[output message number]^*/
^^^/*^free-format secondary line^*/
^^^"fixed-format secondary line"
^^^"fixed-format secondary line "
      .....
      .....
^^^"fixed-format secondary line"
>
      .....
      .....
>
^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]
M^^VERB[^MODIFIER][^MODIFIER]::[b]:[CTAG]:[d][,e]...[z]\\
COMPLD
^^^/*^[output message number]^*/
^^^/*^free-format secondary line^*/
^^^"fixed-format secondary line"
^^^"fixed-format secondary line"
      .....
      .....
^^^"fixed-format secondary line"
;

```

The following example shows the normal response to a cross-connect command (Message No. I.11001) for cross-connecting channel 022 of the primary block circuit terminated on unit 01, module 1, NPC 01 with channel 015 of the primary block circuit terminated on unit 03, module 2, NPC 05. The output message (Message No. O.11001) does not contain secondary lines.

**DACS2FRAME1 88-08-01 20:27:12 LINK-2**

```

M  CONN CRS T0::01-1-01-022,03-2-05-015:CMDSEQ1:CUS::\\
NORM,NORM COMPLD
;

```

(Continued on next page)

## Commands and Messages (Continued)

### Output Messages, Continued

#### Error Response

An error response reports a denial to an input command. The general error response formats are similar to the normal response. The header line is exactly the same, and the primary line only differs in the termination report (DENY). The termination report DENY indicates that the input command was not executed. The first secondary line begins with a 4-character error code (mmmm). This error code describes the reason for the denial of the input command. A free-format secondary line can give more details about the error code.

*Error Response Without Free-Format Secondary Line*

```
^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]
M^^VERB[-MODIFIER][-MODIFIER]::[b]:[CTAG]:[d][,e]...[z]^DENY
^^mmmm
;
```

*Error Response With Free-Format Secondary Line*

```
^^^TID^yy-mm-dd^hh:mm:ss^LINK-l[mm]
M^^VERB[-MODIFIER][-MODIFIER]::[b]:[CTAG]:[d][,e]...[z]^DENY
^^mmmm
^^/*^[output message number]^*/
^^/*^free-format secondary line^*/
;
```

---

(Continued on next page)

## Commands and Messages (Continued)

### Output Messages, Continued

#### Autonomous Response

An autonomous response reports a change in the DACS II system state. The header line of the autonomous response contains the information of source identifier (SID), date, and time. The primary line contains an alarm code (ALMCDE), an autonomous message tag (ATAG), and a verb with modifiers. The verb is always REPT, indicating a report.

##### *Single-Segmented Autonomous Response*

```
^^^SID^yy-mm-dd^hh:mm:ss
ALMCDE^ATAG^REPT[-MODIFIER][-MODIFIER]
^^^/*^[output message number]^*/
^^^/*^free-format secondary line^*/
^^^"fixed-format secondary line"
;
```

##### *Multisegmented Autonomous Response*

```
^^^SID^yy-mm-dd^hh:mm:ss
ALMCDE^ATAG^REPT[-MODIFIER][-MODIFIER]
^^^/*^[output message number]^*/
^^^/*^free-format secondary line^*/
^^^"fixed-format secondary line"
^^^"fixed-format secondary line"
      .....
      .....
^^^"fixed-format secondary line"
>
      .....
      .....
>
^^^SID^yy-mm-dd^hh:mm:ss
ALMCDE^ATAG^REPT[-MODIFIER][-MODIFIER]
^^^/*^[output message number]^*/
^^^/*^free-format secondary line^*/
^^^"fixed-format secondary line"
^^^"fixed-format secondary line"
      .....
      .....
^^^"fixed-format secondary line"
;
```

(Continued on next page)

---

## Commands and Messages (Continued)

---

### Output Messages, Continued

The alarm code indicates an alarm for a trouble condition or a nonalarm condition for a DACS II system state change which does not trigger any alarms; it identifies the severity reported by DACS II and is shown in Table 1-8:

**Table 1-8. Alarm Code Severity**

---

| <i>Value</i> | <i>Meaning</i>              |
|--------------|-----------------------------|
| <b>*C</b>    | Critical alarm message      |
| <b>**</b>    | Major alarm message         |
| <b>*^</b>    | Minor alarm message         |
| <b>A^</b>    | Autonomous nonalarm message |

---

The ATAG is used to check for a skipped output message and for correlation of previous autonomous messages. Some similarity exists with the correlation tag (CTAG) of an input command, but DACS II generates an autonomous message tag for all autonomous output messages. The form of this parameter is xxx[.yyy] where xxx is a 3-digit number and ranges from 050 to 099 ( $050 \leq xxx \leq 099$ ). The yyy is optional; but if used, it may be used as a correlation tag with previous autonomous messages or for association with an action verb. For example, yyy can indicate the number of times that a particular REPT message has been issued ( $001 \leq yyy \leq 999$ ). Value 000 is not used for xxx or yyy.

The free-format secondary line may assist the user in reading the data in the fixed-format secondary line. The message number above the line is used in referring to the manual for more detailed information.

The fixed-format secondary line contains actual message information. This information is described within the individual messages.

---

---

## NPC Addressing

---

### Overview

Two addressing or numbering schemes for network processing circuits are available:

- **Extended (nonhierarchical)**
- **Hierarchical.**

These numbering methods are used to provide a means of locating network processing circuits.

---

### Extended Numbering

The **extended method** 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 (uv-m-np) with dashes separating the parts.

---

---

## On-Line Help Feature

---

### Description

The 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 the command fields. The menu items include:

- Verbs (Action or command)
- Applicable keywords for a command
- Possible choices or number range for a variable field
- Definitions of keywords.

An inappropriate selection will bring an error response.

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. Using help to construct the entire command will probably not be applicable after some experience is gained at entering commands, since all the commands are documented and the direct entry of commands is so much faster.

There are two operators or keyboard controls used to invoke the different levels of the help routine. These operators are:

and .

The question mark is used to initiate the routine or to go into a deeper level (more explanation), and the  is used to see the alternative choices at a given point. The dialogue can be terminated either by entering a CTRL-x or by completing the current command line when it is displayed.

---

## On-Line Help Feature (Continued)

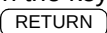
---

Using  

By entering   , 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

provides a greater detail of information on the keywords or variables. If the list is long, DACS II prompts the user to enter  to page through it.

When looking at a menu of choices for a command field, you can select an item and then either continue the process or return to the current position on the command line. To continue the process, use the question mark and the next menu will appear. To return to the command line, use the  key. When looking at a prompt to enter a value, you can enter a value, look at the next choice, or request more information. To look at the next choice or to repeat the choices, use the  key. To obtain more information in order to enter a value, use the question mark. You can continue this process using the question mark after each entry to complete and submit the command via the dialogue. Alternatively, you can use the  key after an entry to obtain the current command line. Then, you can directly enter the remainder of the command line just as you would any DACS command.

---

## On-Line Help Feature (Continued)

### Constructing an Entire Command Using Help

Table 1-9 demonstrates how the menus in the help routine can be used for constructing a simple RTRV (retrieve) command. Only portions of the long menus are shown, but these examples serve to demonstrate how selections are made.

**Table 1-9. Constructing Entire Command Using On-Line Help**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <p>To invoke the help routine at the start level, enter <b>SHIFT</b> <b>?</b> <b>/</b>.</p> <p><b>Result:</b> The DACS II responds with <b>OK</b> and the following menu:</p> <p><b>Select from:</b></p> <ul style="list-style-type: none"> <li>1. ABT</li> <li>2. ALW</li> <li>3. CHG .</li> <li>.</li> <li>.</li> </ul> <p>25. SW Selection?</p>                                                                                                                                                         |
| 2    | <p>To obtain more of an explanation, enter <b>SHIFT</b> <b>?</b> <b>/</b>.</p> <p><b>Results:</b> The DACS II responds with <b>OK</b> and the following list:</p> <p><b>Select from:</b></p> <ul style="list-style-type: none"> <li>1. ABT (perform an abort)</li> <li>2. ALW (perform an allow operation)</li> <li>3. CHG (perform a change)</li> <li>4. CONN (perform a cross-connection)</li> <li>.</li> <li>.</li> <li>.</li> </ul> <p>21. RTRV (perform a retrieve information)</p> <p>Selection?</p> |



**Table 1-9. Constructing Entire Command Using On-Line Help (Continued)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3    | <p>You may enter either <b>21</b> or <b>RTRV</b> followed by <input type="button" value="SHIFT"/> <input type="button" value="?"/>.</p> <p><b>Result:</b> The DACS II responds with this menu:</p> <p><b>Select from:</b></p> <ul style="list-style-type: none"> <li>1. ALM</li> <li>2. BDCST</li> <li>.</li> <li>.</li> <li>.</li> <li>21. STATE</li> <li>22. TACC</li> </ul> <p><b>Selection?</b></p>                         |
| 4    | <p>Again you select the desired verb modifier by entering either <b>21</b> or <b>STATE</b>.</p> <p><b>Result:</b> The DACS responds with:</p> <p><b>Select from:</b></p> <ul style="list-style-type: none"> <li>1. COM</li> <li>2. EQPT</li> <li>3. T3</li> <li>4. TS</li> </ul>                                                                                                                                                |
| 5    | <p>Select <b>2</b> and enter <input type="button" value="RETURN"/> to see the command line developed so far.</p> <p><b>Result:</b> The DACS II responds with:</p> <p><b>RTRV-STATE-EQPT</b></p>                                                                                                                                                                                                                                 |
| 6    | <p>Enter <input type="button" value="SHIFT"/> <input command="" is:<="" next="" of="" p="" part="" see="" the="" to="" type="button" value="?" which=""/> <p><b>1-20 character Target Id (optional).</b></p> <p>Since the frame target ID is optional, it can be omitted which is confirmed by entering <input type="button" value="RETURN"/>. This lists the alternative:</p> <p><b>go to address block (YES/NO)?</b></p> </p> |

**Table 1-9. Constructing Entire Command Using On-Line Help (Continued)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7    | <p>Answer <b>Y</b> and notice the double colons that are added to the end of the command line to close the target ID field.</p> <p>After this, enter a <b>?</b> to obtain the next selection.</p> <p><b>Result:</b> The DACS II responds with:</p> <p><b>units (YES/NO)?</b><br/> <b>specify ftu unit number (YES/NO)?</b><br/> <b>specify dspc unit number (YES/NO)?</b><br/> <b>specify ds3u unit number (YES/NO)?</b><br/> <b>timeslot interchange (YES/NO)?</b></p> |
| 8    | <p>Select <b>4</b>, bringing the resultant command line.</p> <p><b>Result:</b> Entering a question mark brings the response:</p> <p><b>1-10 character Correlation Tag (optional)</b></p> <p>Again this is optional, and entering a <input type="button" value="RETURN"/> requests that you go on to the next field <b>EQPD block (YES/NO)?</b>, which is the alternative to entering the Correlation Tag.</p>                                                           |
| 9    | <p>Answer <b>Y</b> and after the current command line is displayed, enter <input type="button" value="RETURN"/>.</p> <p><b>Result:</b> At this point, the DACS returns the command line as follows:</p> <p><b>RTRV-STATE-EQPT: :TSI: :EQPD;</b></p> <p>The command line is complete.</p> <p><b>EXECUTE (YES/NO)?</b></p>                                                                                                                                                |
| 10   | <p>Now simply answer <b>Y</b> followed by <input type="button" value="RETURN"/> and the command will be executed.</p>                                                                                                                                                                                                                                                                                                                                                   |
|      | <p><b>Stop! End of Procedure.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## On-Line Help Feature (Continued)

### Obtaining Help at a Particular Point on a Command Line

DACS II's on-line help not only can be used to construct a command from scratch but it can also 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, illustrated in Table 1-10, can be initiated at any point by entering

**SHIFT** **?** **/**.

**Table 1-10. Obtaining Help at a Particular Point**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <p>Assume the following multipoint circuit <b>CONN-CRS</b> command was entered and denied because one of the NPCs named in the command must be an MB-type. The output message is:</p> <pre> CONN-CRS-T0::01-1-01-01,01-1-02-03::TRSP::SYM,LEG::; ?D xy 90-10-15 13:12:10 LINK-4 M CMD ::::INERR,BAD_SYNTAX STOPPED /* [0.01131] */ /* CONN-CRS-T0::01-1-01-01,01-1-02-03::TRSP::=SYM=,LEG::; */ ; </pre> <p>The equal signs around the word <b>SYM</b> indicate a problem because it is a multipoint bridge circuit.</p> |
| 2    | <p>Start over using the help command to obtain information. For example, enter the following:</p> <pre> CONN-CRS-T0:: and ? </pre> <p><b>Result:</b> The DACS II responds with:</p> <pre> ds3u unit number = OK ftu unit number = </pre> <p>Since you are working with a DMB which is in a DSPU, if you enter only <b>RETURN</b>, the next option will be displayed, which turns out to be:</p> <pre> dspu unit number = </pre>                                                                                          |

**Table 1-10. Obtaining Help at a Particular Point (Continued)**

| Step | Action                                                                                                                                                                                                                                                                                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3    | <p>To get more information at this point, enter <b>SHIFT</b> <b>?</b>.</p> <p><b>Result:</b> The DACS II responds with:</p> <pre>dspu unit number = OK /* decimal integer:, range 1 - 6 */</pre> <p>This is where the trouble occurred; one of the NPCs in the range must be an MB-type.</p> |
| 4    | <p>Enter <b>05</b> after the equal sign.</p> <p><b>Result:</b> The DACS II responds with:</p> <pre>CONN-CRS-T0::05 dspu module number = OK /* decimal integer:, range 1 - 8 */</pre>                                                                                                         |
| 5    | <p>Enter <b>1</b> after the question mark.</p> <p><b>Result:</b> The DACS II responds with:</p> <pre>CONN-CRS-T0::05-1 dspu npc number = OK /* decimal integer:, range 1 - 2 */</pre>                                                                                                        |
| 6    | <p>Enter <b>1</b> after the question mark.</p> <p><b>Result:</b> The DACS II responds with:</p> <pre>dspu npc number = 1 OK CONN-CRS-T0::05-1-1 dmb conference number = OK /* decimal integer:, range 1 - 85 */</pre>                                                                        |
| 7    | <p>In response to <b>dmb conference number =</b>, enter the <b>SHIFT</b> <b>?</b> to get more information.</p> <p><b>Result:</b> The DACS II responds with:</p> <pre>/*decimal integer, range 1 - 85 */ dmb conference number =</pre>                                                        |
| 8    | <p>Enter your conference number (<b>2</b> for example), and <b>SHIFT</b> <b>?</b>.</p>                                                                                                                                                                                                       |

**Table 1-10. Obtaining Help at a Particular Point (Continued)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9    | <p>In response to <b>ftu npc number =</b> , enter a question mark to get more information.</p> <p><b>Result:</b> The DACS II responds with:</p> <p><b>/* 3 digit decimal integer, range 01-10-1--04-4-32 */</b><br/><b>ftu npc number =</b></p>                                                                                                                                                                                  |
| 10   | <p>Now that the difference between the NPC numbers for the DSPU and FTU sides of the circuit is clear, terminate the dialogue by entering the required <b>ftu npc</b> number followed by a <input type="button" value="RETURN"/> .</p> <p><b>Result:</b> This will cause the command line developed through the dialogue to be displayed. Enter the remaining information from the original command to complete the command.</p> |
|      | <b>Stop! End of Procedure.</b>                                                                                                                                                                                                                                                                                                                                                                                                   |

## Equipment Precautions and Backup Strategies

### Overview

This section is intended to provide the reader with equipment precautions and recommended memory card backup strategies.

---

## 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.*

---

---

## Equipment Precautions (Continued)

---

### Removing and Installing Circuit Packs

#### Circuit Pack Damage

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

#### Removing/Installing 4-Inch and 8-Inch Circuit Packs

The following describes the correct method of physically removing and installing **4-inch** and **8-inch** high circuit packs with a single latch:

■ **To Remove a Circuit Pack:**

1. Unseat the circuit pack from the slot by carefully operating the latch.
2. 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.
4. 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.

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(Continued on next page)

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## Equipment Precautions (Continued)

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### Removing and Installing Circuit Packs, Continued

#### Removing/Installing 12-Inch and 16-Inch Circuit Packs

The following describes the correct method of physically removing and installing **12-inch** high DS3U and **16-inch** high ECCN circuit packs:

■ **To Remove a Circuit Pack:**

1. Unseat the circuit pack from the slot by carefully operating both the top and bottom latch.
2. 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.**
3. Open both latches.
4. 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.

#### Circuit Pack Series Version

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**

---

### **Memory Card Backups**

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.

For additional information, refer to GT 8.1 in Volume II.

---

### **Rotating Memory Cards**

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.

---

### **Off-Site Backup Storage**

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.

---

### **Memory Card Tolerations**

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

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## Background

### Introduction

Acceptance is the process that takes place after a DACS II has been physically installed. During acceptance, each portion of the DACS II frame, its wiring, its units/subassemblies and all associated circuit packs are installed and tested to verify whether the equipment is operational and conforming to system requirement and industry standards. This process is necessary to perform prior to making any attempts to provision service-carrying circuits.

When acceptance is completed, there should be no equipped circuits in the system.

---

## **Background (Continued)**

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### **Objectives**

This chapter provides information to perform the following:

1. Check the installation of all unit circuit packs.
  2. Check the frame and administrative link setup.
  3. Initialize and test system alarms.
  4. Check the system clock, auto backup memory, and report facilities.
  5. Check the synchronizer switchover capability.
  6. Check the cross-connection operation.
- 

### **Related Information**

For related information, refer to:

- *DACS II Command and Message Manual*
  - *DACS II Installation Manual.*
-



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## Background (Continued)

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### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

- Perform Visual Inspection GT 2.1
  - Check Circuit Pack Installation GT 2.2
  - Review Frame and Link Setup GT 2.3
  - Initialize and Test Alarms GT 2.4
  - Check and Set Time-Clock, Facility Report Utilities, and  
Auto Backup Memory GT 2.5
  - Check and Change Line Buildout, Equalizers, and Impedance GT 2.6
  - Test DS3U or HDS3U Protection Switching GT 2.7
  - Check Sync Switchover GT 2.8
  - Check Cross-Connect Operation using a Digital Access Set GT 2.9
  - Check Cross-Connect Operation using an  
Unassigned Voice Terminal GT 2.10
  - Check for Equipped, Out-of-Service, or  
Cross-Connected Circuits GT 2.11
-

## **Perform Visual Inspection**

---

### **Overview**

Prior to provisioning, an inspection of the frame should be done to check for obvious structural damage, such as dents, broken mountings, or broken/dented pins on the backplane panels. The following parts of the frame should be inspected thoroughly:

- Front of the Frame
  - Back of the Frame.
- 

### **Inspect Front of Frame**

Check front of frame for damage (such as dents or broken mountings) resulting from transporting and mounting of equipment.

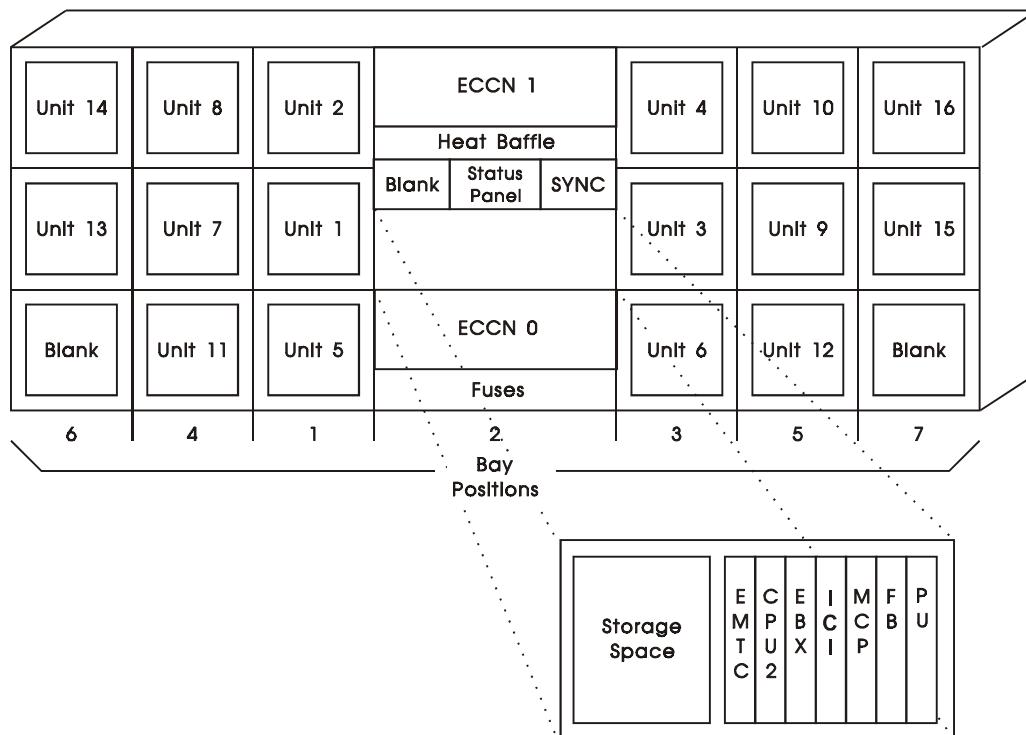
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## Perform Visual Inspection (Continued)

### Inspect Front of Frame, Continued

Figure 2-1 shows the location of equipment in a fully equipped CEF (capacity expansion frame). Use this figure as a guide when looking over shelf mountings. The shelves must be properly aligned and securely mounted.



#### Notes:

- ECCN** = Enhanced Cross-Connect Network
- EMTC** = Expanded Maintenance Circuit
- CPU2** = Central Processing Unit 2
- EBX** = Enhanced Bus Extender
- ICI** = Intelligent Communication Interface
- MCP** = Main Controller Processor
- FB** = Fuse Board
- PU** = Power Unit

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## **Perform Visual Inspection (Continued)**

### **Inspect Front of Frame, Continued**

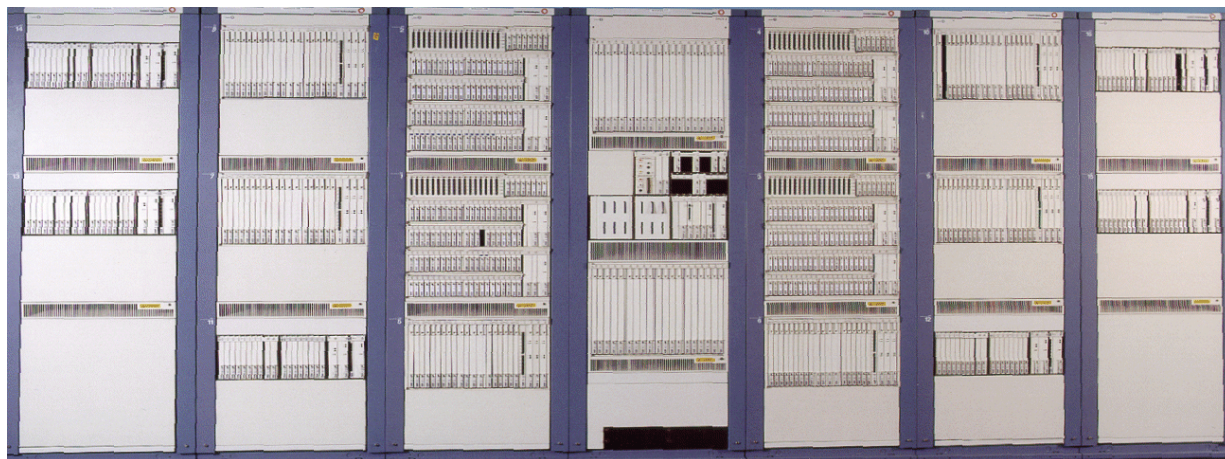


**Figure 2-1. Fully Equipped CEF**

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## Perform Visual Inspection (Continued)

---

### Inspect Back of Frame

When inspecting the back of the frame, verify that the data link cable (for example, M25B) is connected 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).
- Use a G9 adapter for a link to CIU (craft interface unit) for *SLC*<sup>®</sup> Series 5 carrier. This is for an asynchronous link.

**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.

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## **Check Circuit Pack Installation**

---

### **Overview**

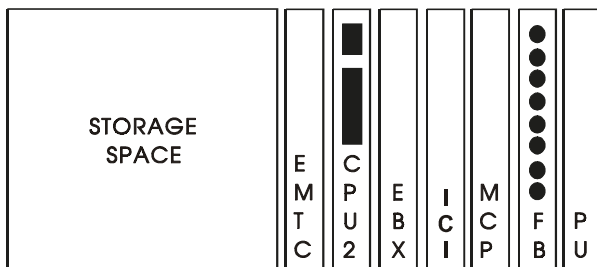
All circuit packs in the frame must be properly installed. Reports on the units can be retrieved to see how the circuit packs are configured. The different circuit packs in the frame that need checking are:

- Main Controller Circuit Pack
  - Synchronizer (Sync) Circuit Packs
  - FTU/IFTU/IFTU 2 Circuit Packs
  - ECCN/CCN Circuit Packs
  - Power Units and Fuses
  - DSPU Circuit Packs
  - DS3U/HDS3U Circuit Packs.
-

## Check Circuit Pack Installation (Continued)

### Check Main Controller Installation

Use Figure 2-2 to verify that the main controller installed properly.



**Notes:**

- ECCN** = Enhanced Cross-Connect Network
- EMTC** = Expanded Maintenance Circuit
- CPU2** = Central Processing Unit 2
- EBX** = Enhanced Bus Extender
- ICI** = Intelligent Communication Interface
- MCP** = Main Controller Processor
- FB** = Fuse Board
- PU** = Power Unit

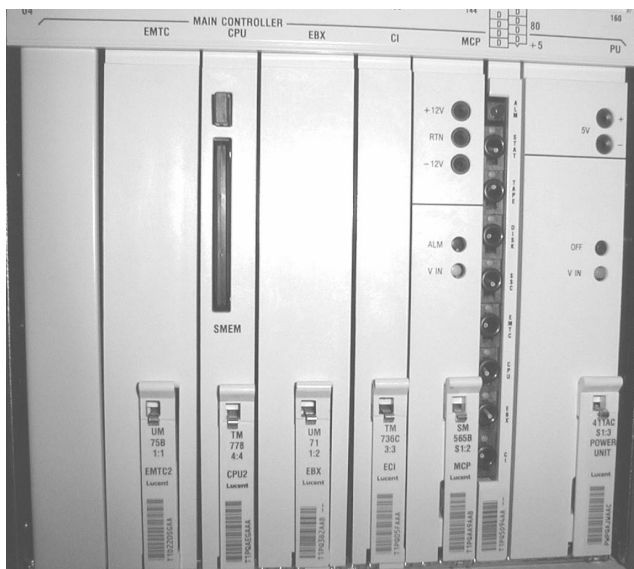


**Figure 2-2. Main Controller**

## Check Circuit Pack Installation (Continued)

### Check Sync Circuit Pack Installation

#### Sync Configuration and Type

When configuring the sync, determine the following information:

- 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.

This information can probably be retrieved from system layout information and installation records.

#### Sync Circuit Packs

Use Table 2-1 to verify time base (TB) and timing link interface (TLI) circuit pack equipment codes, growth types, and timing references.

**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)             |

(Continued on next page)



## Check Circuit Pack Installation (Continued)

### Check Sync Circuit Pack Installation, Continued

Observe the following from Table 2-1:

- The TB types are TB000 for North American-stratum 3, TB100 for 2.048-Mb/s Interface - local office, TB200 for 2.048-Mb/s Interface - toll office, and TB300 for North American-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).

### Sync Configuration and Status

When retrieving information on sync circuit packs, use Table 2-2 while viewing the output report to determine the sync configuration and status.

**Table 2-2. Sync Status Output**

| Message Field    | Outputs and Meanings                                                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| CFR              | MASTER or SLAVED sync configuration.                                                                                                |
| STRATUM          | STR2, STR3, CEPT TOLL, or CEPT LOCAL.                                                                                               |
| MODE             | HOLDOVER, FAST, or NORMAL for each DPLL.                                                                                            |
| SOURCE           | 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 Circuit Pack Installation (Continued)

### Check FTU Circuit Pack Installation

#### FTU Types

There are three types of FTUs:

- Facility Terminating Unit (Original FTU)
- Integrated Facility Terminating Unit (IFTU)
- Integrated Facility Terminating Unit 2 (IFTU2).

Use the illustrations of these units, Figure 2-3 through Figure 2-5, to verify that all FTU circuit packs are properly installed in the frame.

Figure 2-3 shows the FTUs used in the original side bays. Figure 2-4 and Figure 2-5 show the IFTUs used in flexible side bays.

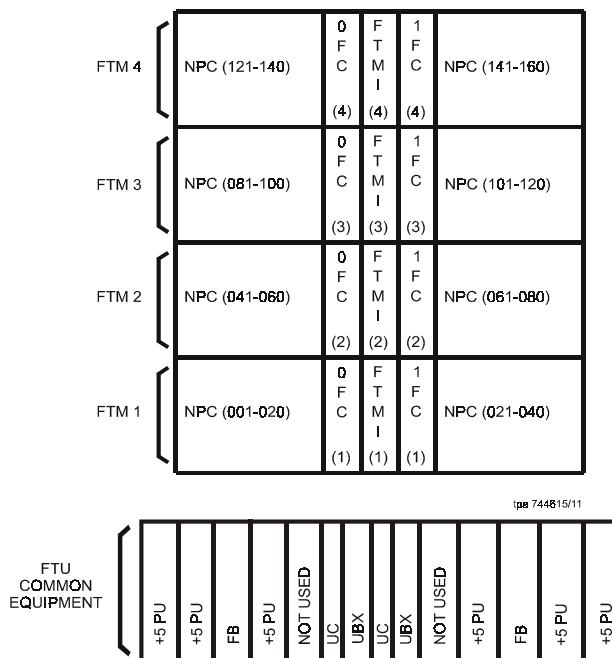
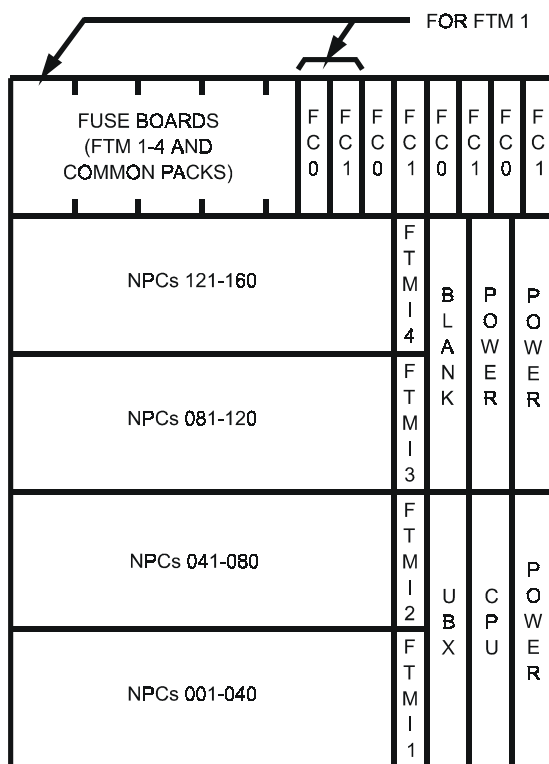


**Figure 2-3. Original FTU**

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check FTU Circuit Pack Installation, Continued



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**Figure 2-4. Integrated Facility Terminating Unit**

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check FTU Circuit Pack Installation, Continued

| FUSE BOARDS<br>1-17 |                 |             |                       |             | P<br>O<br>W<br>E<br>R<br>1 | P<br>O<br>W<br>E<br>R<br>2 | P<br>O<br>W<br>E<br>R<br>3 |
|---------------------|-----------------|-------------|-----------------------|-------------|----------------------------|----------------------------|----------------------------|
| FTM 4               | NPCs<br>121-140 | F<br>C<br>0 | F<br>T<br>M<br>I<br>4 | F<br>C<br>1 | NPCs<br>141-160            | BLANK                      |                            |
| FTM 3               | NPCs<br>80-100  | F<br>C<br>0 | F<br>T<br>M<br>I<br>3 | F<br>C<br>1 | NPCs<br>101-120            |                            |                            |
| FTM 2               | NPCs<br>41-60   | F<br>C<br>0 | F<br>T<br>M<br>I<br>2 | F<br>C<br>1 | NPCs<br>61-80              | U<br>B<br>X                | C<br>P<br>U                |
| FTM 1               | NPCs<br>1-20    | F<br>C<br>0 | F<br>T<br>M<br>I<br>1 | F<br>C<br>1 | NPCs<br>21-40              |                            |                            |

**Figure 2-5. Integrated Facility Terminating Unit 2**

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check FTU Circuit Pack Installation, Continued

#### Unit and FTMI Numbering

The circuit pack digroup cards (for example, DDC) for all equipped NPCs should be installed in the NPC slots. Each circuit pack card contains the circuitry for two NPCs.

Table 2-3 shows the unit and FTMI numbering in extended format only.

**Table 2-3. NPC Location in Unit**

| Nonhierarchical NPC Number | Unit Number | FTMI Number |
|----------------------------|-------------|-------------|
| 001-040                    | 1           | 1           |
| 041-080                    | 1           | 2           |
| 081-120                    | 1           | 3           |
| 121-160                    | 1           | 4           |
| 161-200                    | 2           | 1           |
| 201-240                    | 2           | 2           |
| 241-280                    | 2           | 3           |
| 281-320                    | 2           | 4           |
| 321-360                    | 3           | 1           |
| 361-400                    | 3           | 2           |
| 401-440                    | 3           | 3           |
| 441-480                    | 3           | 4           |
| 481-520                    | 4           | 1           |
| 521-560                    | 4           | 2           |
| 561-600                    | 4           | 3           |
| 601-640                    | 4           | 4           |
| 641-680                    | 5           | 1           |
| 681-720                    | 5           | 2           |
| 721-760                    | 5           | 3           |
| 761-800                    | 5           | 4           |
| 801-840                    | 6           | 1           |
| 841-880                    | 6           | 2           |
| 881-920                    | 6           | 3           |
| 921-960                    | 6           | 4           |
| 961-1000                   | 7           | 1           |
| 1001-1040                  | 7           | 2           |
| 1041-1080                  | 7           | 3           |
| 1081-1120                  | 7           | 4           |

**Table 2-3. NPC Location in Unit (Continued)**

| <b>Nonhierarchical NPC Number</b> | <b>Unit Number</b> | <b>FTMI Number</b> |
|-----------------------------------|--------------------|--------------------|
| 1121-1160                         | 8                  | 1                  |
| 1161-1200                         | 8                  | 2                  |
| 1201-1240                         | 8                  | 3                  |
| 1241-1280                         | 8                  | 4                  |
| 1281-1320                         | 9                  | 1                  |
| 1321-1360                         | 9                  | 2                  |
| 1361-1400                         | 9                  | 3                  |
| 1401-1440                         | 9                  | 4                  |
| 1441-1480                         | 10                 | 1                  |
| 1481-1520                         | 10                 | 2                  |
| 1521-1560                         | 10                 | 3                  |
| 1561-1600                         | 10                 | 4                  |
| 1601-1640                         | 11                 | 1                  |
| 1641-1680                         | 11                 | 2                  |
| 1681-1720                         | 11                 | 3                  |
| 1721-1760                         | 11                 | 4                  |
| 1761-1800                         | 12                 | 1                  |
| 1801-1840                         | 12                 | 2                  |
| 1841-1880                         | 12                 | 3                  |
| 1881-1920                         | 12                 | 4                  |
| 1921-1960                         | 13                 | 1                  |
| 1961-2000                         | 13                 | 2                  |
| 2001-2040                         | 13                 | 3                  |
| 2041-2080                         | 13                 | 4                  |
| 2081-2120                         | 14                 | 1                  |
| 2121-2160                         | 14                 | 2                  |
| 2161-2200                         | 14                 | 3                  |
| 2201-2240                         | 14                 | 4                  |
| 2241-2280                         | 15                 | 1                  |
| 2281-2320                         | 15                 | 2                  |
| 2321-2360                         | 15                 | 3                  |
| 2361-2400                         | 15                 | 4                  |
| 2401-2440                         | 16                 | 1                  |
| 2441-2480                         | 16                 | 2                  |
| 2481-2520                         | 16                 | 3                  |
| 2521-2560                         | 16                 | 4                  |

## Check Circuit Pack Installation (Continued)

### Check ECCN/CCN Circuit Pack Installation

### Check Multibay Circuit Pack Installation

Use Figure 2-6 to locate the ECCN (expanded cross-connect network) in the switch bay. All multibay ECCN circuit packs in the frame must be properly installed. Procedures to install circuit packs are included in Volume II, Chapter 3, *Provisioning*.

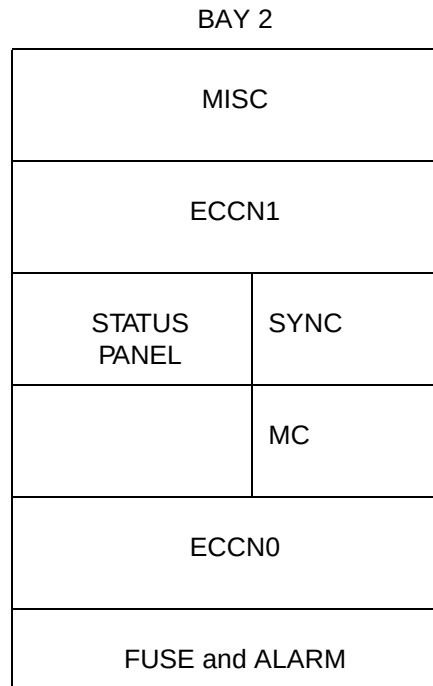


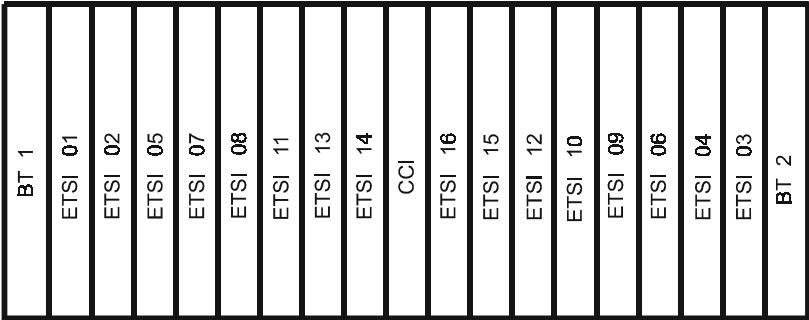
**Figure 2-6. Switch Bay**

(Continued on next page)

Check Circuit Pack Installation  
(Continued)

Check ECCN/CCN  
Circuit Pack  
Installation,  
Continued

The BT (bus terminator, BBR1 code) packs must be 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 pack location and Figure 2-8 for CCN circuit pack location.



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

(Continued on next page)



[illegible]

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

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## Check Circuit Pack Installation (Continued)

### Check ECCN/CCN Circuit Pack Installation, Continued

### Check Single-Bay Circuit Pack Installation

Use Figure 2-9 to check the location of circuit packs in the the CCN2 (cross-connect network).

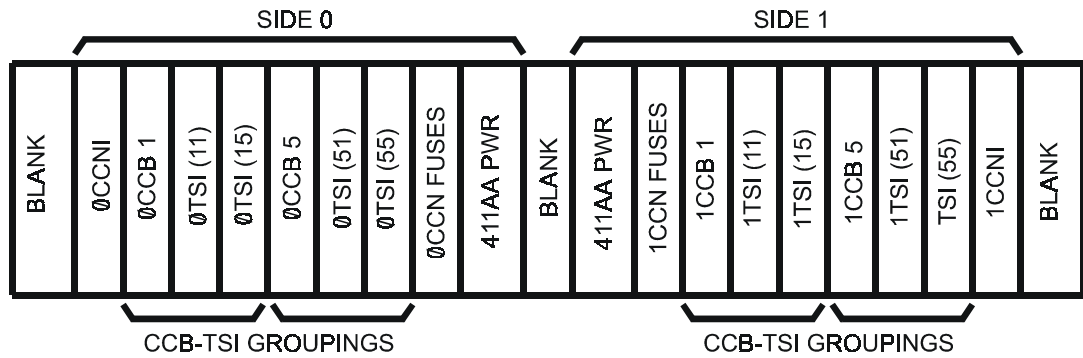
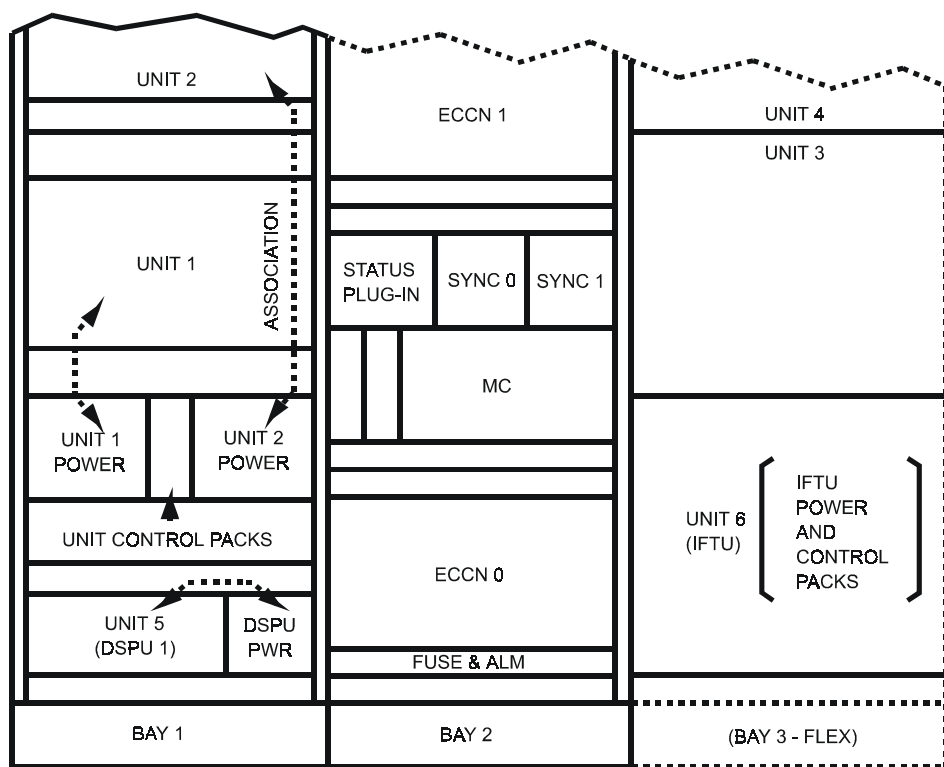


**Figure 2-9. CCN2 Network**

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses

All power units and fuses must be properly installed in the frame. Figure 2-10 illustrates power unit and fuse locations.



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

(Continued on next page)

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## Check Circuit Pack Installation (Continued)

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### Check Power Units and Fuses, Continued

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 through Table 2-9 |
| 48-Volt Power (Single-Bay)                     | Table 2-10                  |
| Sync and Main Controller (CEF)                 | Table 2-11                  |
| Sync and Main Controller (Single-Bay)          | Table 2-12                  |
| 77-Type, FTU Fuses (Original Interface Bay)    | Table 2-13                  |
| IFTU Fuse Assignment                           | Table 2-14                  |
| DSPU5 and DSPU6 Fuses (Original Interface Bay) | Table 2-15                  |
| DSPU Fuses (Flexible Bay)                      | Table 2-16                  |
| Power Unit Requirements                        | Table 2-17                  |

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(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-4. Power Unit Summary (CEF)**

| Circuit Block      | CP Code                 | Designation/ Location                           | Equippage                                                                                                                                                                              |
|--------------------|-------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EFC                | SM565<br>411AA          | MCP /04-144<br>PU /04-160                       | One.<br>One.                                                                                                                                                                           |
| SYNC               | TG58<br>TG58            | 0SPU /14-106<br>1SPU /14-160                    | One.<br>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<br>(Flex Bay) | 411AA<br>411AA<br>411AA | PU /x06-168<br>PU /x14-145<br>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<br>PU /16-144<br>PU /16-156          | Same as IFTU.                                                                                                                                                                          |
| DSPU<br>(Flex Bay) | SM566<br>411AA<br>411AA | DCP /x04-130<br>1PU /x04-142<br>0PU /x04-150    | One.<br>One.<br>One.                                                                                                                                                                   |
| FTU1/3             | 411AA<br>411AA<br>411AA | PU /x28-012<br>PU /x28-024<br>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<br>411AA<br>411AA | PU /x28-124<br>PU /x28-148<br>PU /x28-160       | Same as FTU 1.                                                                                                                                                                         |
| DSPU5/6            | SM566<br>411AA<br>411AA | DCP5/6 /X12-130<br>1PU /X12-142<br>0PU /X12-160 | One. Location x = 1 for unit 5 and x = 3 for unit 6.<br>One.<br>One.                                                                                                                   |
| DS3U5/6<br>HDS3U   | 563A<br>563A<br>563A    | 1 PU/11-140<br>2 PU/11-148<br>3 PU/11-156       | One. Location x = 1 for unit 5 and x = 3 for unit 6.<br>One.<br>One.                                                                                                                   |

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

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          |

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-6. 48-Volt Power (CEF) Feed A Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 2-7. 48-Volt Power (CEF) - Feed B Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).



**Table 2-8. 48-Volt Power (CEF) - Feed C Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 2-9. 48-Volt Power (CEF) - Feed D Fuse**

| 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,<br>424AA, or 563A | Unit 8 (0PU)  | 70D,5A   | Green      |
| D13         | 411AA,SM566,<br>424AA, or 563A | Unit 9 (1PU)  | 70D,5A   | Green      |
| D14         | 411AA,SM566,<br>424AA, or 563A | Unit 10 (1PU) | 70D,5A   | Green      |
| D15         | 411AA,SM566,<br>424AA, or 563A | Unit 12 (1PU) | 70D,5A   | Green      |
| D16         | 411AA,SM566,<br>424AA, or 563A | Unit 13       | 70D,5A   | Green      |
| D17         | 411AA,SM566,<br>424AA, or 563A | Unit 14 (1PU) | 70D,5A   | Green      |
| D18         | 411AA,SM566,<br>424AA, or 563A | Unit 15 (1PU) | 70D,5A   | Green      |
| D19         | 411AA,SM566,<br>424AA, or 563A | Unit 16 (1PU) | 70d,5A   | Green      |

**Note:** . The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-10. 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 2-11. Sync and Main Controller (CEF)**

| Power Unit/<br>Location | Associated Circuit<br>Pack/Location | Power Unit/<br>Location | Associated Circuit<br>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                          |

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-12. Sync and Main Controller (Single-Bay)**

| <b>Synchronizer</b>             |                                             | <b>Main Controller</b>          |                                             |
|---------------------------------|---------------------------------------------|---------------------------------|---------------------------------------------|
| <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
|                                 | 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                                 |

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-13. 77-Type, FTU Fuses (Original Interface Bay)**

| Fuse<br>(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.

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-14. IFTU Fuse Assignment**

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

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-15. DSPU5 and DSPU6 Fuses (Original Interface Bay)**

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

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check Power Units and Fuses, Continued

**Table 2-16. DSPU Fuses (Flexible Bay)**

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

**Note:** Each fuse supplies two DSP circuit packs.

**Table 2-17. Power Unit Requirements**

| Power Unit Code | Output Requirement (DC Volts) | Meter Connections |               |
|-----------------|-------------------------------|-------------------|---------------|
|                 |                               | Positive Lead     | Negative Lead |
| SM565           | +11.75 to +12.25              | +V2               | RTN           |
|                 | −11.75 to −12.25              | −V2               | 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           |

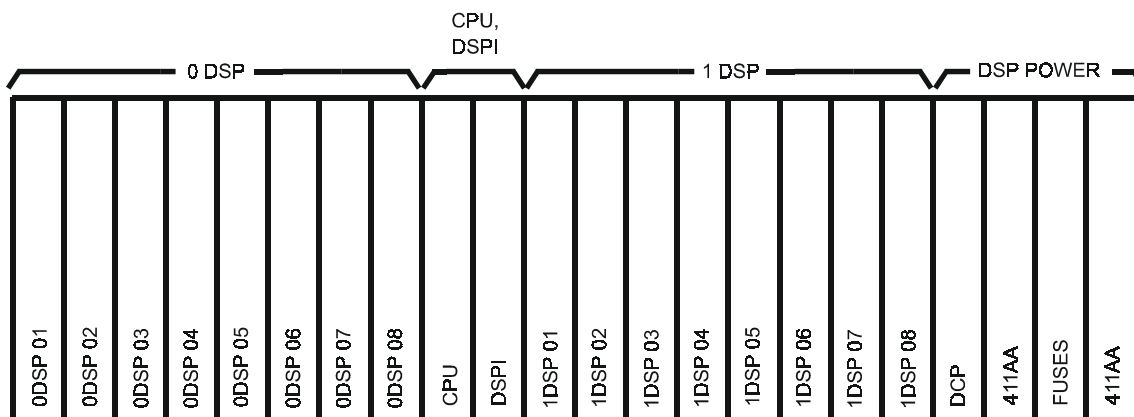


## Check Circuit Pack Installation (Continued)

### Check DSPU Circuit Pack Installation

#### DSPU Shelf

Use Figure 2-11 to verify that all the DSPU circuit packs in the frame are properly installed.



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Figure 2-11. DSPU Shelf

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check DSPU Circuit Pack Installation, Continued

#### DSPU Circuit Pack Positions

Use Table 2-18 to verify that all DSPU fuses are properly installed.

**Table 2-18. DSPU Power Units and Fuses**

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

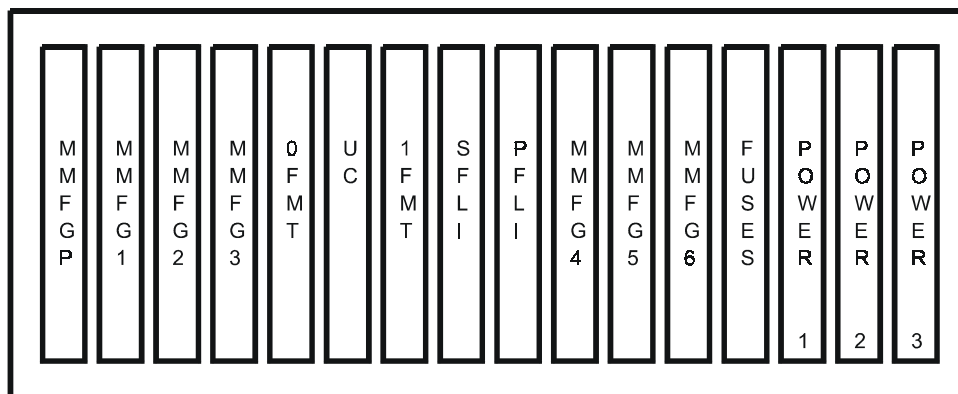
**Note:** Each fuse supplies two DSP circuit packs.

## Check Circuit Pack Installation (Continued)

### Check DS3U or HDS3U Circuit Pack Installation

#### DS3U/HDS3U Shelf

Use Figure 2-12 to verify that all DS3U/HDS3U circuit packs are properly installed. An MMFG consists of MXR (or HMXR) positions. There is an MMFG for protection switching (MIU is not supported).



NOTE: EACH MMFG CONSISTS OF MXR/HMXR AND MIU POSITIONS



**Figure 2-12. Location of MMFGs on DS3U or HDS3U Shelf**

(Continued on next page)

## Check Circuit Pack Installation (Continued)

### Check DS3U or HDS3U Circuit Pack Installation, Continued

#### DS3U/HDS3U Fuse Card Rating

The rating of fuses in older fuse cards for the format converters can be increased from 4 to 5 amps. When equipping an older DS3U unit with Hybrid DS3U circuit packs, check the rating of the fuses for the format converters, which are in position H and F in the fuse card. The designation of the older fuse card that needs to have these two fuses changed is "ED2C980-30" with no "G" designation. Newer fuse cards with the designation "ED2C980-30 G3" do already have the correctly rated (5 amps) fuses in position H and F.

#### DS3U/HDS3U Fuse Assignment

The 563A power units must be installed in the designated slots. All the green power LEDs should be lighted and red failure LEDs should not be lighted.



**NOTE:**

Two of the three power units will supply the load. The third one is required for backup reserve power.

Use Table 2-19 to verify that all the 80-type fuses are installed in the fuse board.

**Table 2-19. DS3U (HDS3U) Fuse Assignment**

| Fuse Designation | Associated CPs |
|------------------|----------------|
| L                | P MXR (HMXR)   |
| K                | 1 MXR (HMXR)   |
| J                | 2 MXR (HMXR)   |
| I                | 3 MXR (HMXR)   |
| H                | 0 FMT (HFMT)   |
| G                | UC             |
| F                | 1 FMT (HFMT)   |
| E                | S FLI          |
| D                | P FLI          |
| C                | 4 MXR (HMXR)   |
| B                | 5 MXR (HMXR)   |
| A                | 6 MXR (HMXR)   |

## Review Frame and Link Setup

### Overview

Reports for the command prioritization and output message screening on administrative links are retrieved to check the frame and link configuration. 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 retrieve information for 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

When retrieving a report on the frame configuration, use Table 2-20 to interpret the message fields.

**Table 2-20. Configuration Meanings**

| Item                   | Meaning                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------|
| FRAME <id>             | Frame number recorded in software                                                                              |
| UNIQUE IDENTIFIER      | Unique frame identifier                                                                                        |
| SOFTWARE SERIAL NUMBER | Software serial number                                                                                         |
| TOTAL BAYS (aa)        | Number of bays in frame configuration                                                                          |
| BAY TYPE (f-ffff)      | Bay type: 1 for original interface 2 for flexible, or dash for bay 2 and unequipped                            |
| TOTAL EQUIPPED (bb)    | Total equipped units                                                                                           |
| CCN <id>               | Type of cross-connect network: 1 for CCN-multibay, non-CEF, 2 for single bay, or E for ECCN                    |
| HEIGHT <id>            | Height of bay: 0 for 7 feet (2133 mm)<br>1 for 11 feet 6 inches (3505 mm)<br>2 for 7 feet 2.6 inches (2200 mm) |
| UNIT:a,...             | Unit designations: 1 for FTU Version 1, 2 for DSPU, 3 for DS3U, 4 for IFTU, or dash for not designated         |
| NPCAD                  | NPC addressing: E for extended, H for hierarchical, or X for 4-digit extended                                  |

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## Review Frame and Link Setup (Continued)

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### Check Link Setup

### Link Setup Options

The link setup options are:

- Priority Level (LEV)
- Screening (SCR)
- Restricted Maintenance
- Link Language (LANG)
- NPC Addressing (NPCAD)
- Macro Component
- Remove Link Privilege.

### Priority Level

The priority level (LEV) determines which command group has priority in command completion over other command groups. The LEV options are:

- 0 - Excluded group
- 1 (lowest)
- 2
- 3 (highest).

The command groups are listed in Table 2-21 .

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(Continued on next page)

## Review Frame and Link Setup (Continued)

### Check Link Setup, Continued

Table 2-21. Command Grouping

| a<br>Circuit Provisioning                                                                                                                                                                                                | b<br>Equip Provisioning | c<br>Maintenance   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|
| ALW-SW-T1                                                                                                                                                                                                                | CRTE-CNFGRN-EQPT        | DGN-EQPT           |
| CONN-BDCST-T0                                                                                                                                                                                                            | CRTE-EQPT               | ED-PRMTR-EQPT      |
| CONN-CRS-T0                                                                                                                                                                                                              | CRTE-LGN                | ENT-EQPT           |
| CONN-CRS-TS                                                                                                                                                                                                              | DLT-LGN                 | INIT-SYS           |
| CONN-CRS1-T0                                                                                                                                                                                                             | DLT-MACRO               | RMV-CNFGRN-EQPT    |
| CRTE-CRS-TS                                                                                                                                                                                                              | DLT-MAP                 | RMV-EQPT           |
| DLT-CRS-TS                                                                                                                                                                                                               | DLT-PRMTR-EQPT          | RST-CNFGRN-EQPT    |
| DISC-BDCST-T0                                                                                                                                                                                                            | ED-PRMTR-EQPT           | RST-EQPT           |
| DISC-CRS-T0                                                                                                                                                                                                              | ED-PRMTR-LINK           | SW-DX-EQPT         |
| DISC-CRS-TS                                                                                                                                                                                                              | ED-PRMTR-NE             | -                  |
| DISC-CRS1-T0                                                                                                                                                                                                             | DISC-EQPT               | -                  |
| INH-SW-T1                                                                                                                                                                                                                | SET-PRVG-TERM           |                    |
| SW-TOPROTN-T1                                                                                                                                                                                                            | SET-PRVG-USER           |                    |
| SW-TOWKG-T1                                                                                                                                                                                                              |                         |                    |
| d<br>Test Access                                                                                                                                                                                                         | e<br>Monitoring         | f<br>Common        |
| ALW-LPBK-T1                                                                                                                                                                                                              | CPY-MEM                 | CHG-LGN            |
| CHG-TL-T0                                                                                                                                                                                                                | ED-DATE                 | CHG-RPATH-T0       |
| CHG-TL-TS                                                                                                                                                                                                                | INIT-LOG                | ED-CNFGRN-EQPT     |
| CONN-HUB-T0                                                                                                                                                                                                              | INIT-REG                | ED-CONN-TS         |
| CONN-TACC-T0                                                                                                                                                                                                             | OPR-ACO-ALL             | ED-CRTE-TS         |
| CONN-TACC-TS                                                                                                                                                                                                             | RST-PASSWD              | ED-OPT-T1          |
| DISC-TACC-T0                                                                                                                                                                                                             | SCHED-PMREPT-ALL        | ED-PRMTR-EQPT      |
| DISC-TACC-TS                                                                                                                                                                                                             | SET-ATTR-EQP            | ED-PRMTR-MACRO/MAP |
| INH-LPBK-T1                                                                                                                                                                                                              | STA-LOCL-RST            | ED-PRMTR-NE        |
| OPR-LPBK-T0                                                                                                                                                                                                              | RTRV                    | ED-PRMTR-T0        |
| OPR-LPBK-T1                                                                                                                                                                                                              |                         | ED-PRMTR-TS        |
| RLS-LPBK-T1                                                                                                                                                                                                              |                         | ENT-MACRO/MAP      |
| -                                                                                                                                                                                                                        | -                       | EXC-MACRO/MAP      |
| -                                                                                                                                                                                                                        | -                       | SET-PRVG-TERM/USER |
| g<br>Restricted Maintenance (RMON Option)                                                                                                                                                                                |                         |                    |
| RST-EQPT::MC::FRC;<br>RST-EQPT::SMEM::CLR:FRC;<br>DLT-FPKG;<br>ED-PRMTR-ALMS::::{ON OFF};<br>ED-PRMTR-MSGLOG::::{ON OFF};<br>CPY-MEM::::PMEM,SMEM:PROG;<br>INIT-MSGLOG::::RSTNUM;<br>UPGRD-SYS;<br>STA-LOCL-RST::::PMEM; |                         |                    |

(Continued on next page)

## Review Frame and Link Setup (Continued)

### Check Link Setup, Screening Options Continued

The screening option determines how the output from a command will be displayed. The screening options are listed in Table 2-22.

**Table 2-22. 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.                                                                                                                                                                      |

### Restricted Maintenance

Restricted maintenance option determines whether the user has permission to use commands in a particular category. The options are:

- RMON - Restricted Maintenance On
- RMOFF - Restricted Maintenance Off

(Continued on next page)



---

## Review Frame and Link Setup (Continued)

---

### Check Link Setup, Continued

#### Link Language

The language options for a link are:

- P - Program Documentation Standards (PDS)
- M - HuMan-Machine Language (MML)
- F - Facility Data Link Communications Protocol language (FDL)

The FDL language may only be provisioned for a single virtual circuit on an X.25 link. Once the X.25 link is set up, provisioning this function only requires the user to specify the language "F" for the virtual circuit; no other I/O parameters affect this channel, except the NPC addressing option.

#### NPC Addressing

The NPC addressing schemes are:

- E - 3-digit Extended Numbering (for example 001)
- X - 4-digit Extended Numbering (for example 0001)
- H - Hierarchical Numbering (for example 01101)

#### Macro Component Completion Messages

This option determines whether macro component completion messages are output. The options are:

- MCON - Macro Component On
- MCOFF - Macro Component Off

#### Remove Link Privilege

This option removes link privilege. The output options are:

- RLK A - Allowed
  - RLK I - Inhibited.
-

## Review Frame and Link Setup (Continued)

### Check Status Register

Use Figure 2-13 to see the bit definition (meaning of 1s) of the raw data field.

```
/*Protocol*/
"{S/X}"
/*Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status*/
"bb:e:k:q:x:m,p,hh"
```

|                              |   |                                                                                                                    |
|------------------------------|---|--------------------------------------------------------------------------------------------------------------------|
| <b>Protocol</b>              | = | S for Snider (Async) or X for X.25 (Synchronous)                                                                   |
| <b>bb = &lt;baud&gt;</b>     | = | 03,06,12,24,48,96                                                                                                  |
| <b>e = &lt;backspace&gt;</b> | = | 0 for true backspace, 1 for underscore backspace, or dash (—) for synchronous link.                                |
| <b>k = &lt;alarm&gt;</b>     | = | 1 (link alarm defined as minor) or 2 (defined as major)                                                            |
| <b>q</b>                     | = | ENQ/ACK protocol 0 disabled, 1 enabled (default)                                                                   |
| <b>x</b>                     | = | Xon/Xoff protocol 0 disabled (default), 1 enabled.                                                                 |
| <b>m = &lt;mode&gt;</b>      | = | 0 (idle), 1 (input message), or 2 (output message)                                                                 |
| <b>p = &lt;software&gt;</b>  | = | 0 (protocol exchanges in-service) or 1 (protocol exchanges out-of-service, which slows down DACS II response time) |
| <b>hh = &lt;hardware&gt;</b> | = | 03 (hardware in-service) or 04 (hardware out-of-service)                                                           |

#### ADDITIONAL LINES FOR X.25:

```
/*Data Link Layer parameters: Frame address*/
"K-b,T1-eee,T3-ggg,N2-aa:{A/B}"
/*Packet Layer parameters*/
"W-c,P-ddd,T20-iii,T22-jjj,T23-kkk,T25-lll,T26-mmm,R20-nn,R22-p,R23-q,R25-r"
/*PVC and SVC range: PVC and SVC group number*/
"ppss:gghh"
```

#### TCP/IP FORMAT:

```
<xy> yy-mm-dd hh:mm:ss [LINK-<link number>]
M RTRV PRMTR LINK::j:[ww] COMPLD
/* [S/X] */
/* Protocol */
"I"
/* Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status
*/
":e:k::,xxxx,hh"
```

**Figure 2-13. Link Status Register**

## **Initialize and Test Alarms**

---

### **Overview**

Alarms must be initialized and tested to verify their performance during a failure, such as a loss of signal or framing.

---

### **Initialize Alarms**

Alarms must be checked to insure that they have been set up to match your frame configuration. A command is used for this purpose.

If you experience a denial when sending the command to the DACS II and if the input command was entered correctly, refer trouble to the installer.

---

### **Test Alarm Operation**

Alarms must be tested to insure that they are operational and will effectively indicate troubles when they occur on the DACS II.

The DACS II must be reset when testing the office alarm. 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

---

### Overview

The time-clock utilities, the facility report utilities, and the auto backup memory must be verified and, if necessary, set/reset prior to provisioning service on the DACS II.

---

### Check and Set Time-Clock Utilities

The time-clock utilities are used to set the time and date on the DACS II frame.

---

### Check and Set Facility Report Utilities and Auto Backup Memory

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. For additional information on facility reports, refer to Volume I, Chapter 9, *Performance Monitoring*.

To select the DS1 facility reports, the FAC parameter is specified in the command. FAC is a hexadecimal word (abcdef) representing 24 bits that specify performance parameters.

To select the E1 facility reports, the PRIM parameter is specified in the command. PRIM is a hexadecimal word (abcd) representing 16 bits that specify performance parameters.

---

(Continued on next page)

## Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory (Continued)

### Check and Set Facility Report Utilities and Auto Backup Memory, Continued

Study hexadecimal word construction per Figure 2-14 for FAC and Figure 2-15 for PRIM and the following examples. Whatever parameters are selected will show up in the AUD CGA command and the midnight report. Construct the hexadecimal word as follows:

- Decide which parameters are needed using Figure 2-14 and Figure 2-15. Each parameter is represented by a digit in the hexadecimal word.
- Work with each part of the hexadecimal word (a, b, c, d or a, b, c, d, e, f) 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 in PRIM are: 10 9 8; the bit positions for b in FAC are: 18 17 16).
- For example, to select MER and FRER in PRIM, 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 (PRIM) or 6 (FAC) hexadecimal characters together in the proper order (a b c d or a b c d e f) to create a 4- or 6-digit hexadecimal number.

(Continued on next page)

---

## Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory (Continued)

---

### Check and Set Facility Report Utilities and Auto Backup Memory, Continued

#### Examples

EXAMPLE 1: For FAC, to select CGA and ERS, the 4-digit binary numbers would be: %a = 0000; %b = 0000; %c = 0000; %d = 0000; %e = 0001; %f = 0001. The resulting FAC hexword is 000011.  
(HEX A=10, B=11, C=12, D=13, E=14, F=15).

EXAMPLE 2: For PRIM, to select PBA, ERS and DM, the 4-digit binary numbers would be: %a = 0000; %b = 0000; %c = 0101; %d = 0001. The resulting PRIM hexword is 0051.  
(HEX A=10, B=11, C=12, D=13, E=14, F=15).

EXAMPLE 1: For FAC, to select CGA and ERS, the 4-digit binary numbers would be: %a = 0000; %b = 0000; %c = 0000; %d = 0000; %e = 0001; %f = 0001. The resulting FAC hexword is 000011.  
(HEX A=1010, B=1011, C=1100, D=1101, E=1110, F=1111).

EXAMPLE 2: For PRIM, to select PBA, ERS and DM, 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).

---

(Continued on next page)

## Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory (Continued)

### Check and Set Facility Report Utilities and Auto Backup Memory, Continued

| Hex Digit | Bit | Parameter                        |
|-----------|-----|----------------------------------|
| f         | 0   | CGA                              |
|           | 1   | OOF                              |
|           | 2   | SLIPS                            |
|           | 3   | BER (Bit Errors)                 |
| e         | 4   | ERS (Errored Second)             |
|           | 5   | SERS (Severe Errored Second)     |
|           | 6   | COFA (Change Of Frame Alignment) |
|           | 7   | CRC6                             |
| d         | 8   | BPV (Bipolar Violation)          |
|           | 9   | FRER (Frame Bit Error)           |
|           | 10  | Not Used                         |
|           | 11  | Not Used                         |
| c         | 12  | Not Used                         |
|           | 13  | Not Used                         |
|           | 14  | Not Used                         |
|           | 15  | Not Used                         |
| b         | 16  | SANE (Shelf Alarm)               |
|           | 17  | SAFE (Shelf Alarm)               |
|           | 18  | DS3 Alarm                        |
|           | 19  | Not Used                         |
| a         | 20  | Not Used                         |
|           | 21  | Not Used                         |
|           | 22  | Not Used                         |
|           | 23  | Not Used                         |

**Figure 2-14. FAC Hex-Word Construction**

---

**Check and Set Time-Clock, Facility Report Utilities, and Auto Backup Memory (Continued)**

---

**Check and Set  
Facility Report  
Utilities and Auto  
Backup Memory,  
Continued**

| 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 2-15. PRIM Hex-Word Construction**

---



## Check and Change Line Buildout, Equalizers and Impedance

### Overview

The line buildout and equalizers must be checked and, if necessary, changed to match the cable with the equipment. Otherwise, signal distortion can occur.

### Check and Change DS3 Line Buildout

#### Check DS3 Line Buildout

The DS3 LBO (line buildout) value indicates how long the indicated cable can be to prevent signal distortion.

For each equipped DS3U (or HDS3U), read the LBO value (ON/OFF) for each DS3 position from the output message. Unequipped DS3 positions will have dashes for the LBOs. If there are no DS3s positions in the frame, the output will say LBO NONE.

Compare the settings with the required values per Table 2-23.

**Table 2-23. DS3 Line Buildout**

| LBO<br>SETTING | TO DSX-3              |                 | TO NETWORK ELEMENT    |                 |
|----------------|-----------------------|-----------------|-----------------------|-----------------|
|                | KS-19224,<br>L2 CABLE | 734A CABLE      | KS-19224,<br>L2 CABLE | 734A CABLE      |
| ON             | 0 to 75 feet          | 0 to 225 feet   | 0 to 150 feet         | 0 to 450 feet   |
| OFF            | 75 to 150 feet        | 225 to 450 feet | 150 to 300 feet       | 450 to 900 feet |

#### Change DS3 Line Buildout

Incorrect values for the DS3 line buildout must be changed.

## Check and Change Line Buildout, Equalizers and Impedance (Continued)

### Check/Change DS1 Equalizer

The DS1 equalizer settings match the cable to the space requirements to prevent signal distortion.

Use Table 2-24 to check the left and right DS1 shelf values (1 through 5) to the required settings for the length of office cabling. Change the equalizer values if necessary

**Table 2-24. DS1 Equalizer Settings**

| Setting | Cable Length (22 Gauge) | Cable Length (26 Gauge) |
|---------|-------------------------|-------------------------|
| 1       | 0 through 133 feet      | 0 through 90 feet       |
| 2       | 133 through 267 feet    | 90 through 180 feet     |
| 3       | 267 through 400 feet    | 180 through 270 feet    |
| 4       | 400 through 533 feet    | 270 through 360 feet    |
| 5       | 533 through 655 feet    | 360 through 450 feet    |

---

## Test DS3U or HDS3U Protection Switching

---

### Overview

The DS3U/HDS3U provides protection switching for the following packs:

- The multiplexers (MXR/HMXR)
  - The facility line interface (FLI)
- 

### Check Multiplexer Protection Switching

The multiplexer units must be verified to insure they have the ability to switch from the service unit to the protection unit and back.

**NOTE:**

The switch can also be initiated by pulling a service MXR (HMXR) pack or entering the MMFG remove command.

Notice the following when viewing the unit overall protection state retrieval report:

- The message is divided into the top half for the FLI status and the bottom half for the MMFG status.
  - In the FLI portion, the maintenance status and then the protection are listed for both the service and protection FLIs.
  - In the MMFG portion, there are 7 MMFG groupings; the leftmost is for the protection MMFG and the others are for MMFGs 1 through 6. In each grouping, the first item is the MXR/EMXR/HMXR maintenance status, followed by the MIU maintenance status (MIU is not supported but EMIU is supported), followed by the protection status, followed by the availability of switching (if MMFG switching was requested).
- 

(Continued on next page)

## Test DS3U or HDS3U Protection Switching (Continued)

### Check Multiplexer Protection Switching, Continued

Use Table 2-25 to interpret the maintenance and protection status keywords. The codes are consolidated; you will never see some of the keywords under the heading in the table for the pack.

**Table 2-25. Maintenance and Protection Keywords**

| Keyword                        | Meaning                                             |
|--------------------------------|-----------------------------------------------------|
| <b>Maintenance Status</b>      |                                                     |
| IS                             | In-Service                                          |
| ISF                            | In-Service, but Failed and Pested                   |
| OOS                            | Out-Of-Service                                      |
| UEQD                           | Unequipped                                          |
| <b>Protection Status</b>       |                                                     |
| 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                           |
| <b>Protection Availability</b> |                                                     |
| AVL                            | Available for Switching                             |
| NVL                            | Not Available for Switching                         |
| (dashes)                       | MMFG Not Selected for Service                       |

**Test DS3U or HDS3U Protection  
Switching (Continued)**

---

**Check Facility  
Line Interface  
Switching**

The FLI (facility line interface) units must be verified to insure they have the ability to switch from the service unit to the protection unit and back.

---

## Check Sync Switchover

### Overview

The sync units must have the ability to switch from the active to the inactive side and back.

### Sync Status Output

Retrieve sync information to determine the active sync side which is given by SOURCE field (inactive side will show MATE). Use Table 2-26 to interpret the message field output and meanings.

**Table 2-26. Sync Status Output**

| Message Field    | Outputs and Meanings                                                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| CFR              | MASTER or SLAVED sync configuration.                                                                                                |
| STRATUM          | STR2, STR3, CEPT TOLL, or CEPT LOCAL.                                                                                               |
| MODE             | HOLDOVER, FAST, or NORMAL for each DPLL.                                                                                            |
| SOURCE           | 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 Cross-Connect Operation

---

### Overview

The NPCs must either have the line signal connected or be looped at the DSX-1 bay jacks.

---

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

The operation of the cross-connect network must be checked to insure there are no problems establishing customer circuits. The cross-connect operation can be 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 DSX-1 bay jacks of one NPC and the other NPC named in the command is looped at the DSX-1 bay 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 DE100 and restored to service for the test. Additional cross-connections involving different units are entered at random to ensure that the frame is operational.

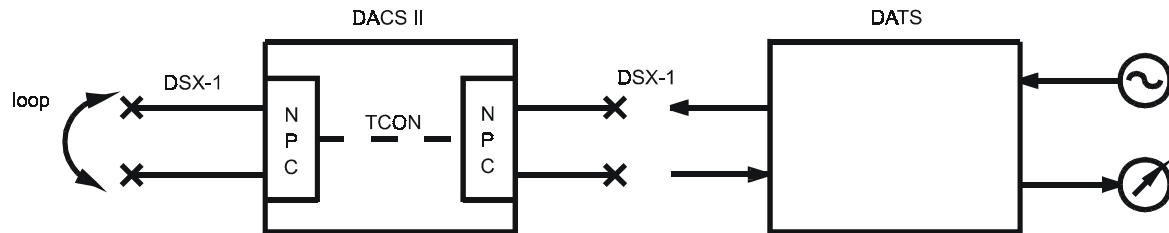
---

(Continued on next page)

## Check Cross-Connect Operation (Continued)

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

Use Figure 2-16 to connect the DATS to the first NPC to be tested.



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**Figure 2-16. Cross-Connection Using DATS**

### Make Random Cross-Connect Tests Using Unassigned Voice Terminal

Another method of checking the cross-connect network is by 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 DE100 and restored to service for the test. Additional cross-connections involving different units are entered at random to ensure that the frame is operational.

(Continued on next page)

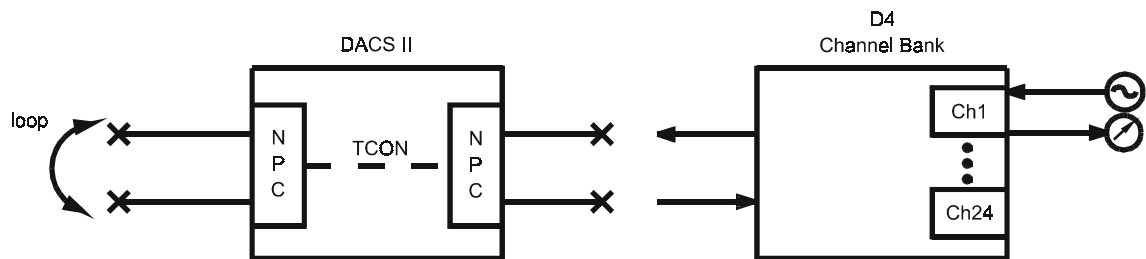


## Check Cross-Connect Operation (Continued)

### Make Random Cross-Connect Tests Using Unassigned Voice Terminal, Continued

At DSX-1, use Figure 2-17 to do the following:

- Patch unassigned channel bank (for example, D4 channel bank which is equipped with the proper plug-in units) to one of the NPCs to be used for cross-connect tests.
- Verify that the other NPC for testing has the signal looped with looping cord between IN and OUT jacks.



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**Figure 2-17. Cross-Connection Using Unassigned Voice Terminal**

---

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

---

### Overview

The units on the frame must be checked 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

When retrieving a report on equipped circuit packs in the entire frame, use Figure 2-18 to determine the link and CCN/ECCN circuit packs from the message.

```
M RTRV STATE EQPT ... COMPLD
"<subject>:g,h,i,j,k,l,m,n,o,p"

g   =   Link 1
h   =   Link 2
i   =   Link 3
j   =   Link 4
k   =   Link 5
l   =   Link 6
t   =   Link 7
m   =   Cross-Connect Side 0
n   =   Cross-Connect Side 1
o   =   CCI 0 / CCNI 0
p   =   CCI 1 / CCNI 1
```

---

**Figure 2-18. Common Equipment Readout**

---

## Check for Equipped, Out-Of-Service, or Cross-Connected Circuits (Continued)

**Check for Out-of-Service Circuit Packs**      Use Figure 2-19 to help with maintenance command construction.

| <b>verb:[xy]:&lt;CP identification&gt;:[ww]{;} or {:&lt;additional info.&gt;;}</b> |                               |                                                                           |
|------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------|
| {RMV-EQPT::                                                                        | SYNC-a;                       | a = 0 or 1                                                                |
| /RST-EQPT::                                                                        | SYNC-a:[ww]:TLI-n[:SSP-b];    | n = 1-4; b = sync port (0 or 1)                                           |
| /DISC-EQPT::                                                                       | SYNC:[ww]:TB                  |                                                                           |
| /DGN-EQPT::                                                                        | CCI-s;                        | s = side 0 or 1                                                           |
|                                                                                    | CCNI-s;                       | s = side 0 or 1                                                           |
|                                                                                    | ETSI-sqq;                     | qq = unit 01-16                                                           |
|                                                                                    | TSI-sft;                      | f = unit (receiving from) (1-6)                                           |
|                                                                                    | CCB-sf;                       | t = unit (transmitting to) (1-6)                                          |
|                                                                                    | ETSI-S,ECCN-s;                |                                                                           |
|                                                                                    | UNIT-[q]q:[ww]:UC;            | [q]q = unit 01-16                                                         |
|                                                                                    | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d = module interface 1-4                                                  |
|                                                                                    | UNIT-[q]q:[ww]:FC-sd;         | sd = FC side (0,1) and FC No. (1-4)                                       |
|                                                                                    | UNIT-[q]q:[ww]:FLI-k;         | k = service (S) or protection (P)                                         |
|                                                                                    | UNIT-[q]q:[ww]:FMT-s;         | s = side (0,1)                                                            |
|                                                                                    | UNIT-[q]q:[ww]:MMFG-c;        | c = DS3 group (1-6, P)                                                    |
|                                                                                    | [FRC][,INCL];                 | FRC = forces RMV with no prot. switch<br>INCL = removes/restores MXR NPCs |
|                                                                                    | UNIT-[q]q:[ww]:MIU-c;         | c = DS3 group (1-6, P)                                                    |
|                                                                                    | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> = NPC No.<br>s = SIDE for DSPU                                  |
|                                                                                    | LINK-j;                       | j = link 1-6                                                              |
| DGN-EQPT::                                                                         | UNIT-[q]q:[ww]:MXR-c;         | c = DS3 group (1-6, P)                                                    |

**Figure 2-19. Maintenance Command Construction**

**Check for Equipped, Out-Of-Service,  
or Cross-Connected Circuits  
(Continued)**

---

**Check for Cross-  
Connect Circuits**

Make sure to remove any test connections and remove service from and degrow any NPCs that were added for the cross-connection checking. Once this is completed, acceptance testing is completed.

---

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## Background

### Introduction

Provisioning is the preparatory action required before DACS II can perform its main functions, cross-connection and test access. Provisioning should be performed in order:

1. Provision the Main Controller
    - Establish the frame date and time.
    - Provision the frame ID and User ID.
  2. Provision the Synchronizer
  3. Provision the Clock and Control Interface (CCI)
  4. Provision the DACS II units and unit circuit packs
  5. Provision the NPCs.
-

## **Background (Continued)**

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### **Objectives**

This chapter provides information to perform the following:

1. Grow the frame.
  2. Provision the timing sources used for cross-connections.
  3. Provision the frame's units and subassemblies.
  4. Provision the NPCs used for cross-connections.
  5. Provision the DS1, *SLC*<sup>®</sup>, DS3, and Subrate facilities.
  6. Provision the links used to communicate with the DACS II.
- 

### **Related Information**

For related information, refer to the *DACS II Command and Message Manual*.

---

## Background (Continued)

### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

|                                                                                        |         |
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| ■ Installing Synchronizers                                                             | GT 3.2  |
| ■ Query Sync Status                                                                    | GT 3.3  |
| ■ Add/Change Synchronizer Timing Link Interface                                        | GT 3.4  |
| ■ Change Synchronizer Timing Base Stratum                                              | GT 3.5  |
| ■ Install ECCN Circuit Packs                                                           | GT 3.6  |
| ■ Install Multibay CCN Circuit Packs                                                   | GT 3.7  |
| ■ Install Single-Bay CCN Circuit Packs                                                 | GT 3.8  |
| ■ Install CEF Power Units and Fuses                                                    | GT 3.9  |
| ■ Install Multibay Power Units and Fuses                                               | GT 3.10 |
| ■ Install Single-Bay Power Units and Fuses                                             | GT 3.11 |
| ■ Install Plugs-Ins, Grow and Restore FTU/IFTU                                         | GT 3.12 |
| ■ Provision Common Equipment                                                           | GT 3.13 |
| ■ Provision Protection MMFG                                                            | GT 3.14 |
| ■ Activate/Deactivate DS3 Unprotected Service Alarm                                    | GT 3.15 |
| ■ Provision DSPU                                                                       | GT 3.16 |
| ■ Change DS1/DS3/HDS3 Parameters                                                       | GT 3.17 |
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| ■ Install, Grow Circuit Packs and Restore DSPU NPC                                     | GT 3.24 |
| ■ Change Subrate Hub ID                                                                | GT 3.25 |
| ■ Change NPC Type, IW, or ALMOPT-AIS                                                   | GT 3.26 |
| ■ Change Alarm Threshold                                                               | GT 3.27 |
| ■ Change Subrate ECLOC                                                                 | GT 3.28 |
| ■ Query or Change TS0 Bit Monitoring                                                   | GT 3.29 |

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## Background (Continued)

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### Related Tasks, Continued

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| ■ Establish <i>SLC</i> 96 Carrier System Mode I<br>or <i>SLC</i> Series 5 Carrier System FPB (Feature Package B) | GT 3.31 |
| ■ Establish <i>SLC</i> 96 Carrier System Mode III                                                                | GT 3.32 |
| ■ Establish New <i>SLC</i> Series 5 Carrier System<br>Feature Package C (FPC)                                    | GT 3.33 |
| ■ Establish Retrofit <i>SLC</i> Series 5 Carrier System<br>Feature Package C (FPC)                               | GT 3.34 |
| ■ Make DSX-1 Connections                                                                                         | GT 3.35 |
| ■ Reinitialize the CIU for Use ( <i>SLC</i> Series 5 Carrier)                                                    | GT 3.36 |
| ■ Add Protection Switching (Existing System)                                                                     | GT 3.37 |
| ■ Retrofit <i>SLC</i> Mode I, 5:5 to 5:4                                                                         | GT 3.38 |
| ■ Delete Digroup Designation                                                                                     | GT 3.39 |
| ■ Change Far-End Bank Identifier                                                                                 | GT 3.40 |
| ■ Change State of the <i>SLC</i> Series 5 RT Bank                                                                | GT 3.41 |
| ■ Change Power/Miscellaneous Alarm Designation                                                                   | GT 3.42 |
| ■ Operate <i>SLC</i> Carrier System Protection Switch<br>or Line Loopback                                        | GT 3.43 |
| ■ Establish DS3 Facility                                                                                         | GT 3.44 |
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| ■ Remove and Degrow IFTU/FTU                                                                                     | GT 3.52 |
| ■ Remove and Degrow DSPU                                                                                         | GT 3.53 |
| ■ Remove and Degrow ECCN/CCN                                                                                     | GT 3.54 |
| ■ Remove and Degrow DS3U or HDS3U                                                                                | GT 3.55 |

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## Frame

### Overview

Frame growth is performed at the time of installation, and is usually not required again. However, if a trouble occurs on the frame, it is important for maintenance technicians to know frame growth information and procedures.

All equipment need not be grown and restored at the same time. Some equipment can be grown but restored at a later time.

---

## Configure Frame

---

### Overview

The menu driven INIT SYS FRAME routine is used to enter bay configuration information into the data base. The frame number and unique frame ID can be protected against change 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.

---

### User DAX

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.

---

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## Configure Frame (Continued)

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### Main Menu Selections

The following holds true for when making selections from the Configure Frame main menu:

- 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.

---

### NPC Addressing

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.

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 SET-PRVG-{USER/TERM} command.

---

---

## Configure Frame (Continued)

---

### Bay Numbering

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. 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.

The bay numbering portion of the initialize/reset option begins with the lowest numbered bay which has not already been entered. The default order of numbering the bays is in consecutive order, but you can make selections to configure the bays in a different order.

---

### Unit Types

The possible unit types which can be configured with the frame are:

- IFTU2
- DSPU
- DS3U.

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.

---

---

## Grow Frame ID

---

### Overview

Growing the frame ID performs the following actions:

- Places a nonzero frame number and optional unique identifier into the database
- Enables the use of a 3-character frame field (if developed)
- 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 INIT-SYS routine, these numbers are fixed, and the same numbers must be entered. If the frame numbers were not protected, different frame and UID numbers can be entered. The UID distinguishes the frame from others having the same frame number; frequently, the COMMON LANGUAGE\* code is used as the identifier.

---

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

## Synchronizers

**Overview** The synchronizer provides timing throughout the DACS II system.

### Install Synchronizer Circuit Packs

**Overview** 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).

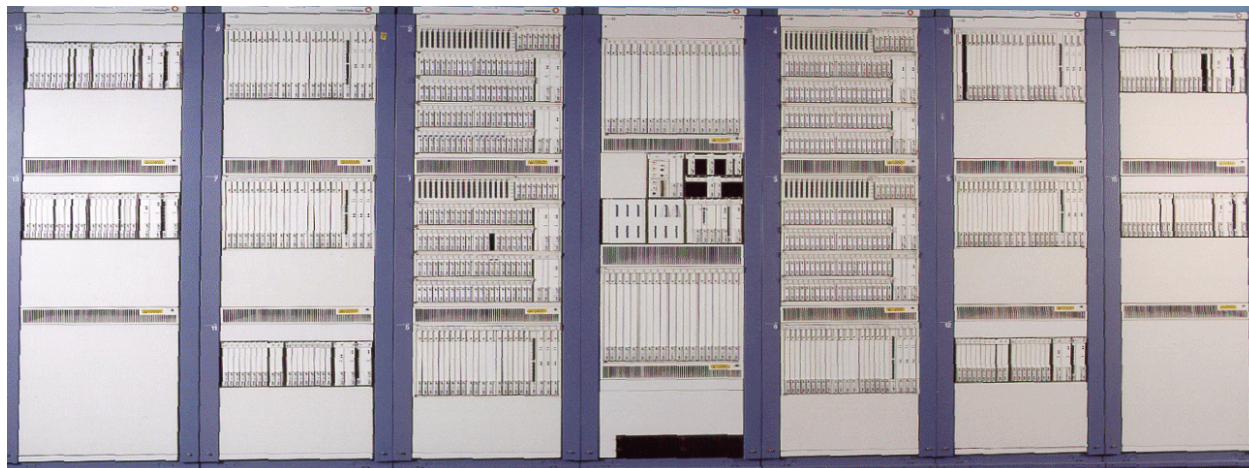
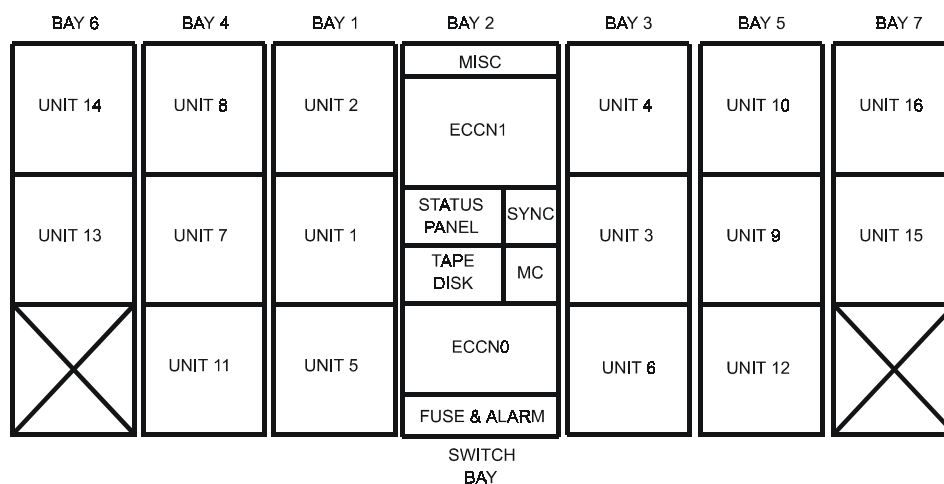


**Figure 3-1. Fully-Equipped CEF**

---

## Install Synchronizer Circuit Packs (Continued)

---

### Sync Options

When configuring the sync, determine the following options from system layout information and installation records:

- 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.

---

### Time Base (TB)

The Timing Base (TB) contains oscillators used by the Sync to synchronize the DACS II system timing signals at the frequency of the incoming timing reference.

The TB should be checked and installed using the TB portion of Table 3-1.

---

## Install Synchronizer Circuit Packs (Continued)

### Timing Link Interface (TLI)

The TLI provides the external timing interface for the Sync. It can be optionally equipped as timing extractors to derive timing or as timing distributors to distribute the timing signal to other network equipment, for example, other DACS II.

The TLI should be checked and installed using the TLI portion of Table 3-1

**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

---

### Overview

The NPC timing can come from either the built-in timing clock from a customer office site or from a E1 NPC source connected to a TLI pack. The wiring needs to be checked to determine if the timing is coming from the desired source.

---

### NPC Positions

Use the list below 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 |
|------------------------|--------------------|
| 01-1-30                | 030                |
| 01-1-32                | 032                |
| 01-2-30                | 070                |
| 01-2-32                | 072                |
| 02-1-30                | 190                |
| 02-1-32                | 192                |
| 02-2-30                | 230                |
| 02-2-32                | 232                |

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

---



## **Grow Sync Timebase, Configure Sync Mode, and Restore Sync**

---

**Overview**                      One TLI must be grown for timing distribution in the MASTER Sync Mode.

---

**TB Oven**                      Always wait 30 minutes for TB oven to reach temperature before attempting to restore sync to service.

---

---

## Grow and Restore Sync TLIs

---

### Overview

The TLI packs must be grown and restored to perform the timing extraction function for the DACS II system. The TLI pack provides phase information for the timing references, and sends this information to the DPLL pack. The DPLL pack locks the TLI clock and provides the timing for the entire DACS II system.

---

### TLI Uses

The TLI can be used as a:

- Timing Extractor
  - Timing Distributor.
- 

### Rules

Note the following information about growing and restoring sync TLIs:

- The sync ports (SSP 0 and SSP 1) on each TLI are grown separately; the type (TE 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.
-

## Grow and Restore Sync TLIs (Continued)

### TLI Growth Options

The signal format specifications for the TP- and TE-type TLIs are listed in Table 3-2 and Table 3-3. The TC-, TU-, and TR-type TLIs can have any xyz value (000 to 999).

**Table 3-2. TP-Type Growth Options**

| <b>TP (Primary Block Timing Extractor)</b> |                                         |
|--------------------------------------------|-----------------------------------------|
| <b>Option x</b>                            | <b>Frame Format</b>                     |
| 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                                 |
| <b>Option y</b>                            | <b>Line Format</b>                      |
| 0 or 2                                     | Alternate Mark Inversion                |
| 1 or 3                                     | High Density Bipolar of Order 3 (HDB3)  |
| 4 or 9                                     | Invalid                                 |
| <b>Option z</b>                            | <b>Channel Format</b>                   |
| 0 through 9                                | Unassigned                              |

(Continued on next page)

## Grow and Restore Sync TLIs (Continued)

### TLI Growth Options, Continued

**Table 3-3. TE-Type Growth Options**

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

## Query Sync Status

### Overview

The report displayed from a sync status query indicates the operation status of each component in the sync.

### Sync Status Output

Use Table 3-4 to review the sync status report.

**Table 3-4. Sync Status Output**

| Message Field    | Outputs and Meanings                                                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| CFR              | MASTER or SLAVED sync configuration.                                                                                                |
| STRATUM          | STR2, STR3, CEPT TOLL, or CEPT LOCAL.                                                                                               |
| MODE             | HOLDOVER, FAST, or NORMAL for each DPLL.                                                                                            |
| SOURCE           | 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.                                                       |

## Query Sync Status (Continued)

### Sync Status Register

Crosscouple is the normal running mode in which the sync sides are locked together (in-phase). Figure 3-2 lists the sync status register output and the byte meanings.

**/\*STR: b01, b02, b03, b04, b05, b06\*/**  
**"STR: byte1, byte2, byte3, byte4, byte5, byte6"**

#### 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)<br>(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 | fgh | = | 000 for stratum 3, 001 for 2-Mb/s local |
|   |   | (master mode)       |     |   | 010 for 2-Mb/s toll, 011 for stratum 2  |

---

---

**Figure 3-2. Sync Status Register**

---

## Query Sync Status (Continued)

### TLI Slots

If the sync configuration = MASTER, then an 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.

Figure 3-3 displays the TLI locations.

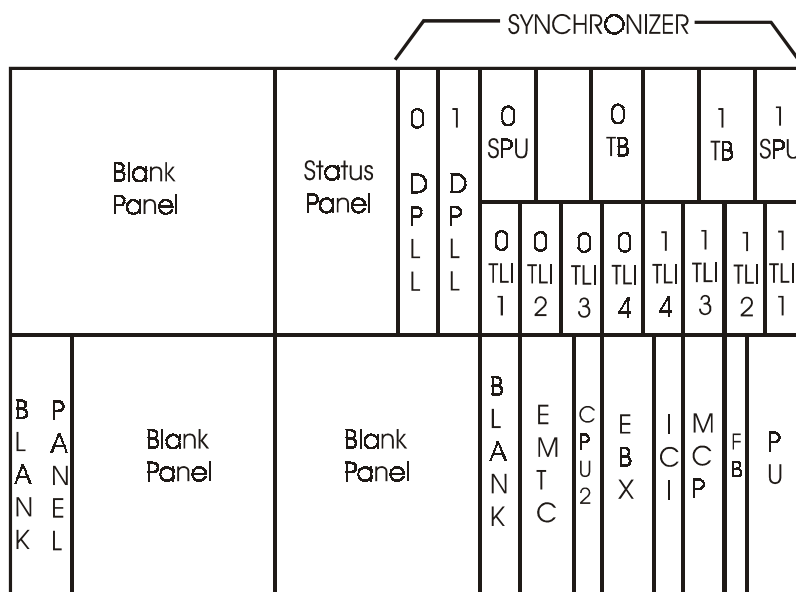


**Figure 3-3. Identification of Main Controller Slots in CEF**



## Add/Change Synchronizer Timing Link Interface

### Overview

With the command used for this procedure, the following actions can be performed:

- Connect additional TLIs (timing link interfaces) for timing extraction
- Change the existing TLI types, NPC source, or sync port priority.

Any NPC timing sources are entered in the data base. 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.*

**TLI Status Register** Figure 3-4 lists the TLI status register output and the byte meanings.

```
/*STATUS: aa, bb, cc*/
"byte1, byte2, byte3"
```

#### 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 3-4. TLI Status Register**

## Add/Change Synchronizer Timing Link Interface (Continued)

### Sync Port (SSP) Status Register

Figure 3-5 lists the sync port status register output and the byte meanings.

```
/*STATUS:aa,bb,cc,ee,ff*/
"byte1,byte2,byte3,byte4,byte5"
[/*SYNC SOURCE*/]
["NPC-<npc No.>"]
```

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

#### BYTE 3 BIT POSITIONS: abc de fgh

| FRAME FORMAT (abc) |            | LINE FORMAT (de) |                 | FREQ (fgh) |  |
|--------------------|------------|------------------|-----------------|------------|--|
| NORTH AMER.        | CEPT       |                  |                 |            |  |
| 000 = D4           | 000 = NSA  | 00 = Bipolar     | 000 = 512 KHz   |            |  |
| 001 = ESF          | 001 = ERSM | 01 = B8ZS        | 001 = 1.0 MHz   |            |  |
| 010 = DDS          | 010 = CAS0 | 10 = AMI         | 010 = 1.544 MHz |            |  |
|                    | 011 = CAS1 | 01 = HDB3        | 011 = 2.048 MHz |            |  |
|                    |            |                  | 100 = 5.0 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 3-5. Sync Port Status Register**

---

## Change Synchronizer Time Base Stratum

---

### Overview

The level (stratum) of the sync time base can be changed while the sync remains in operation. The procedure for changing the synchronizer time base stratum involves the following actions:

1. Remove one side of the TB
2. Degrow the TB and replace it
3. Regrow the sync at the new stratum
4. Configure the sync mode, and restore the side
5. Repeat the above actions 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.*

---

---

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

**Overview** All cross-connections between NPCs are connected via the CCN or ECCN.

---

### Install ECCN Circuit Packs

---

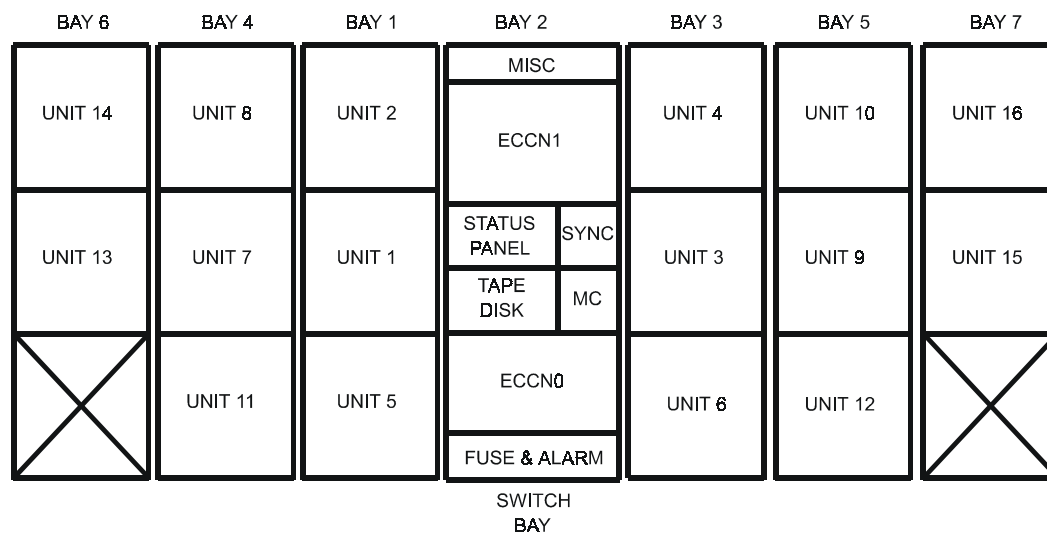
**Overview** If necessary, the installation of the power units for the CCN and CCN2 can be checked per *Install Power Units and Fuses* procedures found in Volume II, Chapter 3. The ECCN circuit packs have built-in power converters.

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

---

## Install ECCN Circuit Packs (Continued)

**ECCN Location on Frame** Figure 3-6 displays the location of the ECCN in bay 2 of the frame. Use this figure to help locate side 0 and side 1 shelves of the ECCN.



tpa 789630/11

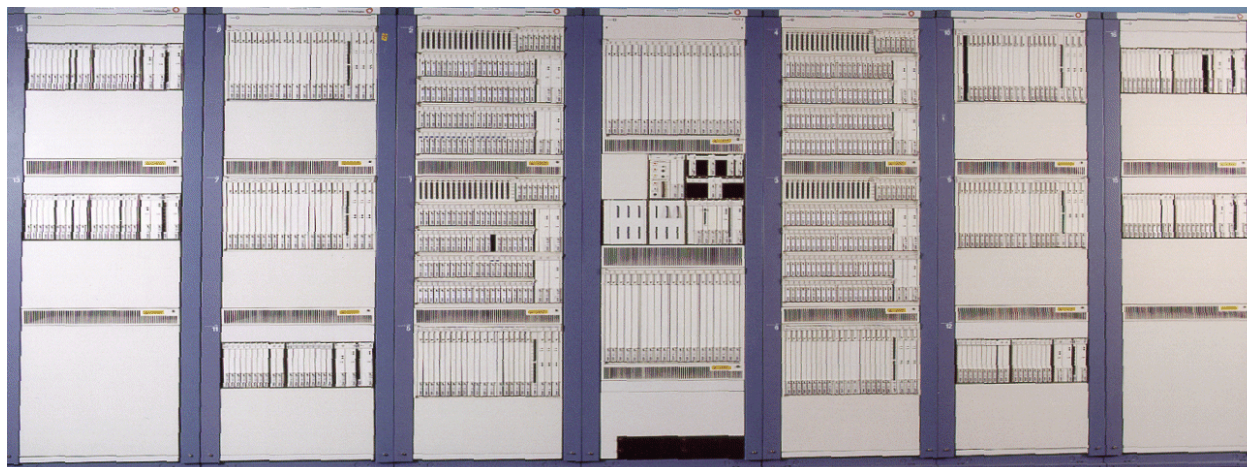


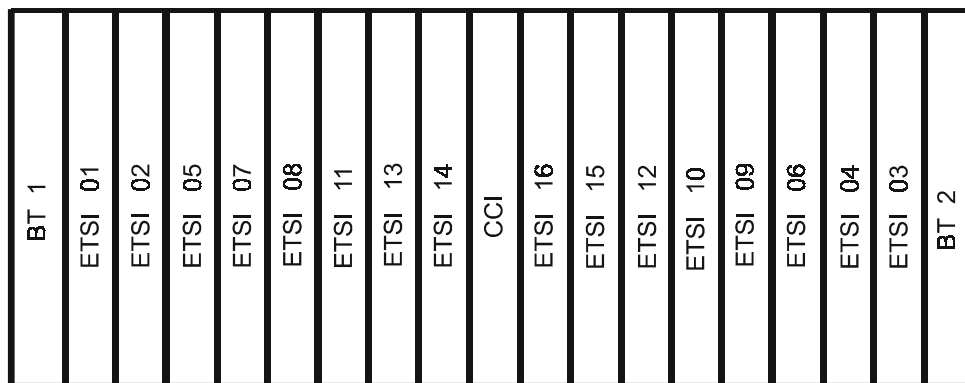
**Figure 3-6. Fully-Equipped Capacity Expansion Frame**

## Install ECCN Circuit Packs (Continued)

### ECCN Circuit Pack Location

Figure 3-7 displays the location of circuit packs on the ECCN shelf. Use this figure to help verify that the following circuit packs are installed in their appropriate slots:

- BT (bus terminator, BBR1 code)
- CCI (clock control interface, BBS1 code)
- ETSI (expanded time slot interface, BBS2 code).



tpa 789631/11

**Figure 3-7. Location of Circuit Packs on ECCN Shelf**

### ETSI Cards

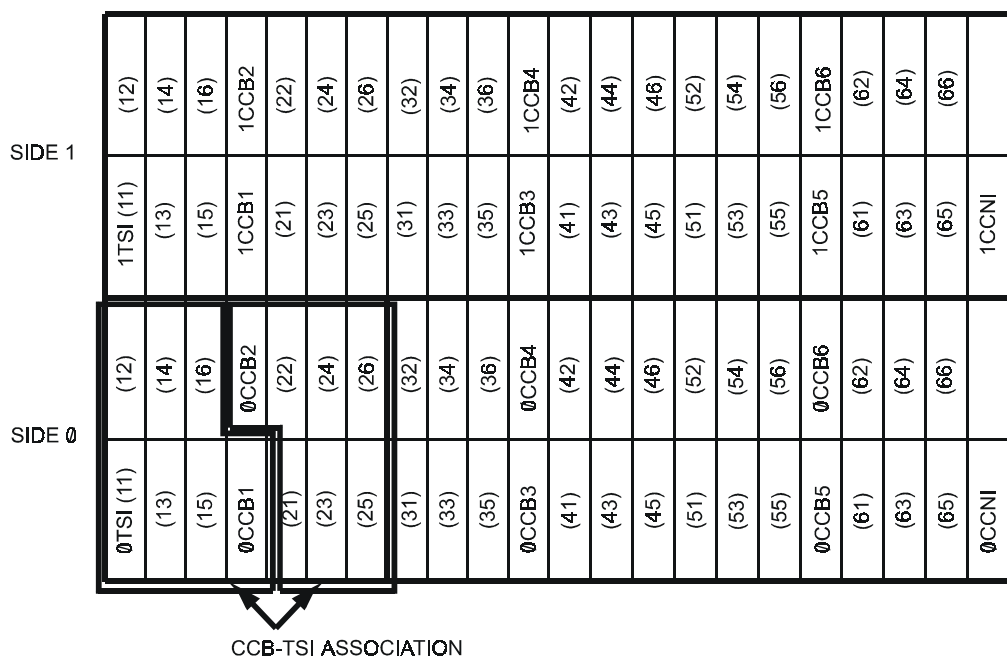
The ETSI slots are assigned on each side of the common CCI pack to roughly match the associated unit positions and ordering of the units in the CEF configuration.

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

## Install Multibay CCN Circuit Packs

### CCN Circuit Pack Location

Use Figure 3-8 to locate the CCN in the frame. Figure 3-8 shows the organization of the circuit packs within the CCN. The CCNI (cross-connect interface) card (UM30) is installed in designated slots on both sides of the CCN.



tpa 744614/11

**Figure 3-8. Duplicated Cross-Connect Network for Multibay Frame**

## Install Multibay CCN Circuit Packs (Continued)

### CCB and TSI Circuit Packs

Use Table 3-5 to determine which CCB (cross-connect buffer) (UM26) and TSI (TM660) circuit pack slots are needed to support the DACS units which will be used (1 through 6).

**Table 3-5. 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 |

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

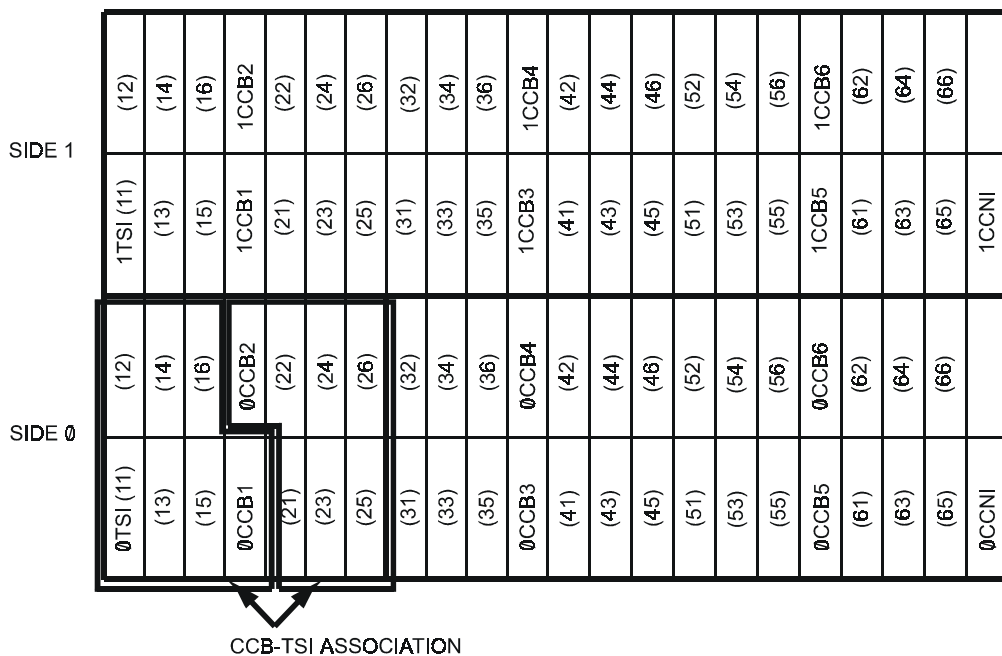
Normally, as units are added, TSIs are installed to connect the new unit with every other one and the total number of TSIs equals the total number of units squared.



## Install Single-Bay CCN Circuit Packs

### CCN Circuit Pack Location

Use Figure 3-9 to locate the CCN in the frame. Figure 3-9 shows the organization of the circuit packs within the CCN. The CCNI (cross-connect interface) card (UM30) is installed in designated slots on both sides of the CCN.



tpa 744614/11

**Figure 3-9. Duplicated Cross-Connect Network for Single Bay Frame**

## **Install Single-Bay CCN Circuit Packs (Continued)**

---

### **CCB and TSI Circuit Packs**

Install the required CCBs (UM26) and TSIs (TM660) on the inactive side. Plugging into the inactive side prevents possible transmission hits.

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.

---

---

## Remove and Degrow ECCN/CCN

---

### Overview

This section provides information to support procedures for removing ECCN (expanded cross-connect network) or CCN (cross-connect network) circuit packs. However, the UC must be in-service to use other commands. Therefore, the unit components must be removed and degrown in the following order:

1. The NPCs in the unit are removed and degrown

NPCs can be physically removed from the unit after they are removed from service. After degrowing a pack or group, it can be regrown with different specifications.

2. The UC is removed and degrown.

The associated and ETSI (or CCB and TSIs) and FMTs on both sides of the unit will **automatically** be removed and degrown.

There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

---

### Deprovisioning Tips

When removing and degrowing the ECCN/CCN:

- Allowable active-side removals are: ETSIs if no involved CONN 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 DS3U FMTs (formatters) and 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).

---

### Alarm Indication

A major alarm will be registered after the ECCN/CCN side has been out of service for more than two minutes.

---

## Units (IFTU, DS3U, HDS3U, and DSPU)

### Overview

This section provides information on installing, growing, and restoring the various components of the IFTU, DS3U, HDS3U, and DSPU shelves.

The shelf power units and fuses must be installed prior to provisioning.

## Install CEF Power Units and Fuses

### Power Unit Locations

Use Figure 3-10 to locate the power unit slots for the section of the frame being equipped.

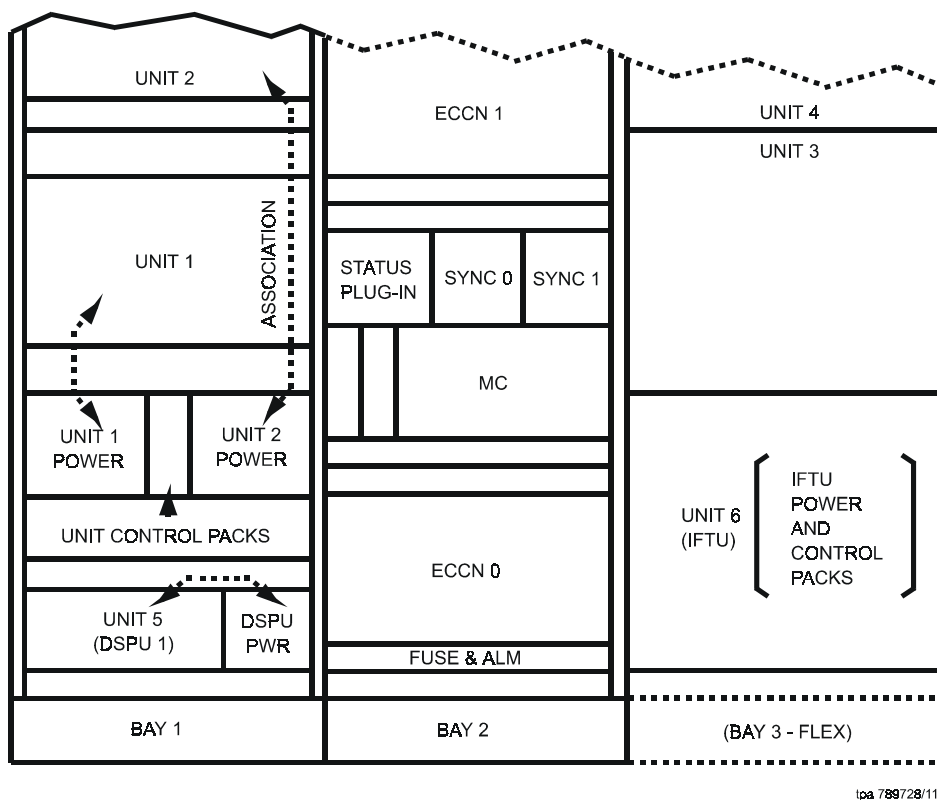


**Figure 3-10. Original Interface Bay (Bay 1)**

## Install CEF Power Units and Fuses (Continued)

### Power Unit and Fuse Codes and Quantities

The list below indicates the appropriate tables to find information on various power units and fuses.

| Description                                                                       | Table                        |
|-----------------------------------------------------------------------------------|------------------------------|
| Required codes and quantities of power units                                      | Table 3-6                    |
| Required 48-Volt Input fuses for the fuse and alarm panel (bottom frame)          | Table 3-7 through Table 3-10 |
| Fuse board designations for the sync and main controller                          | Table 3-11                   |
| Fuse board designations for the IFTU                                              | Table 3-12                   |
| Fuse board designations for the DSPU                                              | Table 3-13                   |
| Fuse board designations for the DSPUs 5 and 6 fuses in the original interface bay | Table 3-14                   |
| Fuse board designations for the FTU (77-Type fuses)                               | Table 3-15                   |
| Required output power of each power unit                                          | Table 3-16                   |

**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.

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(Continued on next page)

## Install CEF Power Units and Fuses (Continued)

### Power Unit and Fuse Codes and Quantities, Continued

**Table 3-6. CEF Power Unit Summary**

| Circuit Block      | CP Code | Designation/ Location   | Equipage                                                                                                                                                                                     |
|--------------------|---------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EFC                | SM565   | MCP /04-144             | One.                                                                                                                                                                                         |
|                    | 411AA   | PU /04-160              | One.                                                                                                                                                                                         |
| SYNC               | TG58    | 0SPU /14-106            | One.                                                                                                                                                                                         |
|                    | TG58    | 1SPU /14-160            | 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<br>(Flex Bay) | 411AA   | PU /x06-168             | 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).                                                                 |
|                    | 411AA   | PU /x14-145             |                                                                                                                                                                                              |
|                    | 411AA   | PU /x14-158             |                                                                                                                                                                                              |
| IFTU 2             |         | PU /16-132              | Same as IFTU.                                                                                                                                                                                |
|                    | 424AA   | PU /16-144              |                                                                                                                                                                                              |
|                    |         | PU /16-156              |                                                                                                                                                                                              |
| DSPU<br>(Flex Bay) | SM566   | DCP /x04-130            | One.                                                                                                                                                                                         |
|                    | 411AA   | 1PU /x04-142            | One.                                                                                                                                                                                         |
|                    | 411AA   | 0PU /x04-150            | One.                                                                                                                                                                                         |
| FTU1/3             | 411AA   | PU /x28-012             | 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).<br>Location<br>x = 1 for units 1 & 3 and x = 3 for units 2 & 4. |
|                    | 411AA   | PU /x28-024             |                                                                                                                                                                                              |
|                    | 411AA   | PU /x28-048             |                                                                                                                                                                                              |
| FTU2/4             | 411AA   | PU /x28-124             | Same as FTU 1.                                                                                                                                                                               |
|                    | 411AA   | PU /x28-148             |                                                                                                                                                                                              |
|                    | 411AA   | PU /x28-160             |                                                                                                                                                                                              |
| DSPU5/6            | SM566   | DCP5/6 /X12-130         | One. Location x = 1 for unit 5 and x = 3 for unit 6.                                                                                                                                         |
|                    | 411AA   | 1PU /X12-142            | One.                                                                                                                                                                                         |
|                    | 411AA   | 0PU /X12-160            | One.                                                                                                                                                                                         |
| DS3U5/6<br>HDS3U   | 563A    | 1 PU/11-140 for unit 6. | One. Location x = 1 for unit 5 and x = 3                                                                                                                                                     |
|                    | 563A    | 2 PU/11-148             | One.                                                                                                                                                                                         |
|                    | 563A    | 3 PU/11-156             | One.                                                                                                                                                                                         |

**Table 3-7. 48-Volt Power (CEF) Feed A Fuse**

| 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, ETSIs                   | 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, DS3U, or HDS3U).

**Table 3-8. 48-Volt Power (CEF) - Feed B Fuse**

| 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 (OPU)  | 70D, 5A | Green      |
| B14         | 411AA, SM566, 424AA, or 563A | Unit 10 (OPU) | 70D, 5A | Green      |
| B15         | 411AA, SM566, 424AA, or 563A | Unit 11       | 70D, 5A | Green      |
| B16         | 411AA, SM566, 424AA, or 563A | Unit 12 (OPU) | 70D, 5A | Green      |
| B17         | 411AA, SM566, 424AA, or 563A | Unit 14       | 70D, 5A | Green      |
| B18         | 411AA, SM566, 424AA, or 563A | Unit 15 (OPU) | 70D, 5A | Green      |
| B19         | 411AA, SM566, 424AA, or 563A | Unit 16 (OPU) | 70D, 5A | Green      |

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).



**Table 3-9. 48-Volt Power (CEF) - Feed C Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 3-10. 48-Volt Power (CEF) - Feed D Fuse**

| 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,<br>424AA, or 563A | Unit 8 (0PU)  | 70D,5A   | Green      |
| D13         | 411AA,SM566,<br>424AA, or 563A | Unit 9 (1PU)  | 70D,5A   | Green      |
| D14         | 411AA,SM566,<br>424AA, or 563A | Unit 10 (1PU) | 70D,5A   | Green      |
| D15         | 411AA,SM566,<br>424AA, or 563A | Unit 12 (1PU) | 70D,5A   | Green      |
| D16         | 411AA,SM566,<br>424AA, or 563A | Unit 13       | 70D,5A   | Green      |
| D17         | 411AA,SM566,<br>424AA, or 563A | Unit 14 (1PU) | 70D,5A   | Green      |
| D18         | 411AA,SM566,<br>424AA, or 563A | Unit 15 (1PU) | 70D,5A   | Green      |
| D19         | 411AA,SM566,<br>424AA, or 563A | Unit 16 (1PU) | 70d,5A   | Green      |

**Note:** . The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 3-11. Secondary Power Distribution (Sync and Main Controller) (CEF)**

| Power Unit/<br>Location | Associated Circuit<br>Pack/Location | Power Unit/<br>Location | Associated Circuit<br>Pack/Location |
|-------------------------|-------------------------------------|-------------------------|-------------------------------------|
| 1SPU /14-160            | OTLI2 /10-112                       |                         | EBX /04-128                         |
|                         | OTLI3 /10-120                       |                         | CPU2 /04-120                        |
|                         | OTLI4 /10-128                       |                         | EMTC /04-112                        |
|                         | ODPLL /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 3-12. IFTU Fuse Assignment**

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

**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 3-13. DSPU Fuses (Flexible Bay)**

| Fuse                                                   | Side   | DSP Position (Note) |
|--------------------------------------------------------|--------|---------------------|
| (Top)                                                  | 0 DSPU | (Left Panel)        |
| No. 1                                                  |        | First and second    |
| No. 2                                                  |        | Third and fourth    |
| No. 3                                                  |        | Fifth and sixth     |
| No. 4                                                  |        | Seventh and eighth  |
| (Bottom)                                               | 1 DSPU | (Right Panel)       |
| No. 5                                                  |        | First and second    |
| No. 6                                                  |        | Third and fourth    |
| No. 7                                                  |        | Fifth and sixth     |
| No. 8                                                  |        | Seventh and eighth  |
| <b>Note:</b> Each fuse supplies two DSP circuit packs. |        |                     |

**Table 3-14. DSPU5 and DSPU6 Fuses (Original Interface Bay)**

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

**Table 3-15. 77-Type, FTU Fuses - Original Interface Bay**

| <b>Fuse<br/>(Note)</b> | <b>Associated NPCs</b> |              |              |              |
|------------------------|------------------------|--------------|--------------|--------------|
|                        | <b>FTU 1</b>           | <b>FTU 2</b> | <b>FTU 3</b> | <b>FTU 4</b> |
| 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 3-16. Power Unit Requirements**

|                        |                                      | <b>Meter Connections</b> |                      |
|------------------------|--------------------------------------|--------------------------|----------------------|
| <b>Power Unit Code</b> | <b>Output Requirement (DC Volts)</b> | <b>Positive Lead</b>     | <b>Negative Lead</b> |
| SM565                  | +11.75 to +12.25                     | +V2                      | RTN                  |
|                        | -11.75 to -12.25                     | -V2                      | 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

### Power Unit Locations

Use Figure 3-11 to locate the power unit slots for the section of the frame being equipped. A DSPU is shown in unit 5; but with flexible side bays, DSPUs can be mounted in other unit positions.

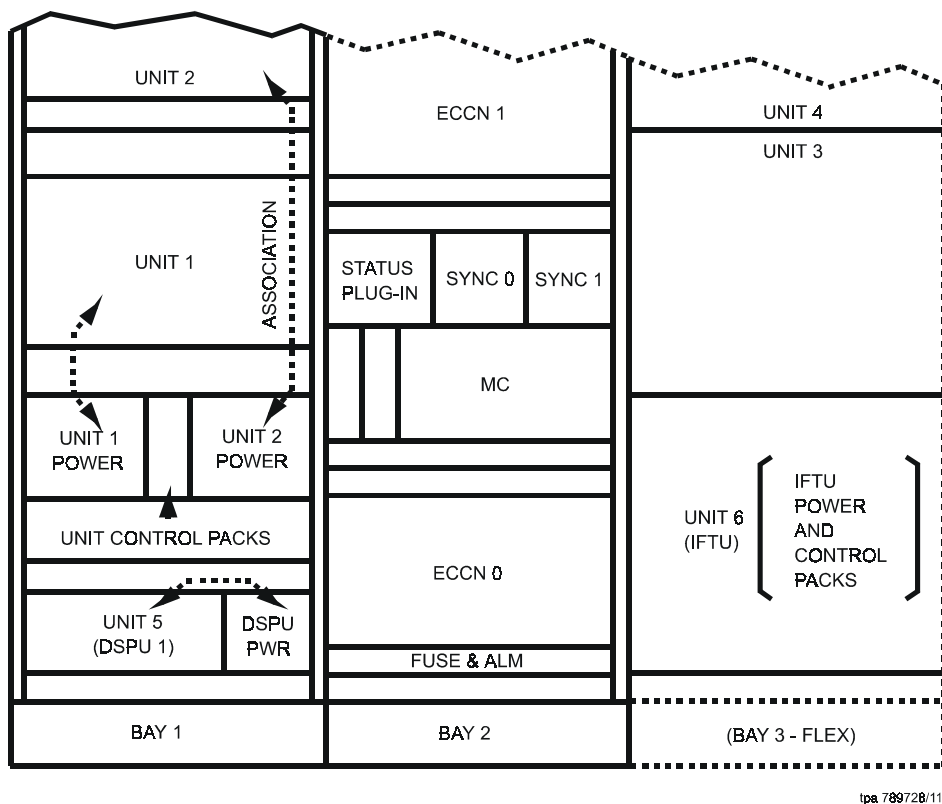


**Figure 3-11. Multibay Frame Layout**



**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.



## Install Multibay Power Units and Fuses (Continued)

### Power Unit and Fuse Codes and Quantities

The list below indicates the appropriate tables to find information on various power units and fuses.

| Description                                                                       | Table      |
|-----------------------------------------------------------------------------------|------------|
| Required codes and quantities of power units                                      | Table 3-17 |
| Required 48-Volt Input fuses for the fuse and alarm panel (bottom frame)          | Table 3-18 |
| Fuse board designations for the sync and main controller                          | Table 3-19 |
| Fuse board designations for the IFTU                                              | Table 3-20 |
| Fuse board designations for the CCN                                               | Table 3-21 |
| Fuse board designations for the FTU (77-Type fuses) in the Original Interface Bay | Table 3-22 |
| Fuse board designations for the DSPUs 5 and 6 fuses in the original interface bay | Table 3-23 |
| Required output power of each power unit                                          | Table 3-24 |

**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.

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(Continued on next page)

## Install Multibay Power Units and Fuses (Continued)

### Power Unit and Fuse Codes and Quantities, Continued

**Table 3-17. Power Unit Summary (Non-CEF)**

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

**Table 3-17. Power Unit Summary (Non-CEF) (Continued)**

| <b>Circuit Block</b> | <b>CP Code</b> | <b>Designation/ Location</b> | <b>Equipage</b> |
|----------------------|----------------|------------------------------|-----------------|
| DSPU5                | 485AB          |                              |                 |
|                      | SM566          | DCP5 /109-130                | One             |
|                      | 411AA          | 1PU /109-142                 | One             |
| DSPU6                | 411AA          | 0PU /109-160                 | One             |
|                      | SM566          | DCP6 /312-130                | One             |
|                      | 411AA          | 0PU /312-142                 | One             |
|                      | 411AA          | 1PU /312-160                 | 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 3-18. 48-Volt Power (Non-CEF)**

| <b>Fuse</b> | <b>Power Unit/CP</b> |                              |             |                   |
|-------------|----------------------|------------------------------|-------------|-------------------|
|             | <b>Type</b>          | <b>Designation/ Location</b> | <b>Size</b> | <b>Bead Color</b> |
| 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        | -                    | (Indicating Fuse for A5-2)   | 70G,5A      | Red               |
| A5-2        | 485AB                | PU1 (CCN 0)                  | 70D,5A      | Green             |
| A6-1        | -                    | (Indicating Fuse for A6-2)   | 70G,5A      | Red               |
| A6-2        | 485AB                | PU2 (CCN 0)                  | 70D,5A      | Green             |
| 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             |

**Table 3-18. 48-Volt Power (Non-CEF) (Continued)**

| Fuse  | Power Unit/CP                          |                               |         |            |
|-------|----------------------------------------|-------------------------------|---------|------------|
|       | Type                                   | Designation/<br>Location      | Size    | Bead Color |
| B4    | 411AA                                  | 328-124                       | 70D,5A  | Green      |
| B5-1  | -                                      | (Indicating Fuse<br>for B5-2) | 70G,.5A | Red        |
| B5-2  | 485AB                                  | PU3 (CCN 0)                   | 70D,5A  | Green      |
| B6-1  | -                                      | (Indicating Fuse<br>for B6-2) | 70G,.5A | Red        |
| 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      |
| C1    | 411AA                                  | 128-048<br>(Unit 1)           | 70D,5A  | Green      |
| C2    | 411AA                                  | 128-148<br>(Unit 2)           | 70D,5A  | Green      |
| C3    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 328-048*<br>(Unit 3)          | 70D,5A  | Green      |
| C4    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 328-148*<br>(Unit 4)          | 70D,5A  | Green      |
| C5-1  | -                                      | (Indicating Fuse<br>for C5-2) | 70G,.5A | Red        |
| C5-2, | 485AB                                  | PU5 (1CCN)                    | 70D,5A  | Green      |
| C6-1  | -                                      | (Indicating Fuse<br>for C6-2) | 70G,.5A | Red        |
| C6-2, | 485AB                                  | PU6 (1CCN)                    | 70D,5A  | Green      |

**Table 3-18. 48-Volt Power (Non-CEF) (Continued)**

| Fuse  | Power Unit/CP                          |                               |        |            |
|-------|----------------------------------------|-------------------------------|--------|------------|
|       | Type                                   | Designation/<br>Location      | Size   | Bead Color |
| C7    | 411AA                                  | (Unit 5)                      | 70D,5A | Green      |
| C8    | -                                      | TLIs                          | 70D,5A | Green      |
| C9    | SM566*,<br>424AA,<br>411AA, or<br>563A | DCP6*<br><br>(Unit 6)         | 70D,5A | Green      |
| D1    | 411AA                                  | 128-064<br><br>(Unit 1)       | 70D,5A | Green      |
| D2    | 411AA                                  | 128-160<br><br>(Unit 2)       | 70D,5A | Green      |
| D3    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 328-064*<br><br>(Unit 3)      | 70D,5A | Green      |
| D4    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 326-160*<br><br>(Unit 4)      | 70D,5A | Green      |
| D5-1  | -                                      | (Indicating Fuse<br>for D5-2) | 70G,5A | Red        |
| D5-2  | 485AB                                  | PU7 (1CCN)                    | 70D,5A | Green      |
| D6-1  | -                                      | (Indicating Fuse<br>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 3-19. Sync and Main Controller (Non-CEF)**

| <b>Synchronizer</b>             |                                             | <b>Main Controller</b>          |                                             |
|---------------------------------|---------------------------------------------|---------------------------------|---------------------------------------------|
| <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| 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 3-20. IFTU Fuse Assignment**

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

**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 3-21. CCN Fuses (Original Interface Bay)**

| <b>CCN0</b>               |                                             | <b>CCN1</b>               |                                             |
|---------------------------|---------------------------------------------|---------------------------|---------------------------------------------|
| <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| JA1 /215-072              | 0CCNI /246-150                              | JA1 /215-088              | 1CCNI /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                             |

**Table 3-21. CCN Fuses (Original Interface Bay) (Continued)**

| <b>CCN0</b>               |                                             | <b>CCN1</b>               |                                             |
|---------------------------|---------------------------------------------|---------------------------|---------------------------------------------|
| <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| 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 3-22. 77-Type, FTU Fuses (Original Interface Bay)**

| <b>Fuse<br/>(Note)</b>                                                              | <b>Associated NPCs</b> |                |                |                |
|-------------------------------------------------------------------------------------|------------------------|----------------|----------------|----------------|
|                                                                                     | <b>FTU 1</b>           | <b>FTU 2</b>   | <b>FTU 3</b>   | <b>FTU 4</b>   |
| <b>CA</b>                                                                           | <b>1-8</b>             | <b>161-168</b> | <b>321-328</b> | <b>481-488</b> |
| 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       |
| <b>Note:</b> The unit number that the fuses supply is identified on the fuse panel. |                        |                |                |                |

**Table 3-23. DSPU5 and DSPU6 Fuses**

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

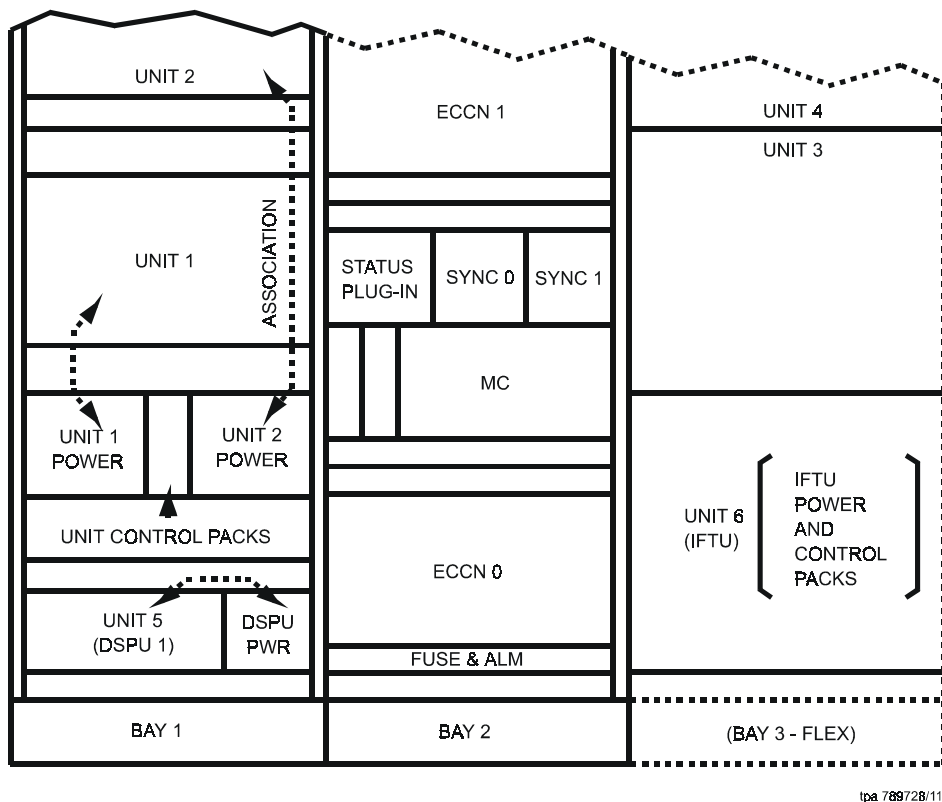
**Table 3-24. Power Unit Requirements**

| Power Unit Code | Output Requirement (DC Volts) | Meter Connections |               |
|-----------------|-------------------------------|-------------------|---------------|
|                 |                               | Positive Lead     | Negative Lead |
| SM565           | +11.75 to +12.25              | +V2               | RTN           |
|                 | -11.75 to -12.25              | -V2               | 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

### Power Unit Locations

Use Figure 3-12 to locate the power unit slots for the section of the frame being equipped.



tpa 789728/11

**Figure 3-12. Single-Bay Frame Layout**

The FTU power units should be equipped in left-to-right order even though they all feed a common bus. Low voltage can only be detected if one power unit is disconnected and the test is repeated for all combinations of the power units.

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## Install Single-Bay Power Units and Fuses (Continued)

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### Power Unit and Fuse Codes and Quantities

The list below indicates the appropriate tables to find information on various power units and fuses.

| Description                                                                                                                  | Table      |
|------------------------------------------------------------------------------------------------------------------------------|------------|
| Required codes and quantities of power units                                                                                 | Table 3-17 |
| Required 48-Volt Input fuses for the fuse and alarm panel (bottom frame)                                                     | Table 3-25 |
| Fuse board designations for the FTU (77-Type fuses) in the Original Interface Bay (only FTU 1 applies to a single-bay frame) | Table 3-26 |
| Fuse board designations for the DSPUs 5 fuses in the original interface bay                                                  | Table 3-27 |
| Fuse board designations for the sync and main controller                                                                     | Table 3-28 |
| Required output power of each power unit                                                                                     | Table 3-29 |

**NOTE:**

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.

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(Continued on next page)

**Table 3-25. 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 3-26. 77-Type, FTU Fuses - Single-Bay Frame**

| Fuse<br>(Note) | Associated NPCs<br>FTU 1 |
|----------------|--------------------------|
| CA             | 1-8                      |
| CB             | 9-16                     |
| CC             | 17-24                    |
| CD             | 25-32                    |
| CE             | 33-40                    |
| CF             | 41-48                    |
| CG             | 49-56                    |

**Table 3-26. 77-Type, FTU Fuses - Single-Bay Frame (Continued)**

| <b>Fuse<br/>(Note)</b> | <b>Associated NPCs<br/>FTU 1</b> |
|------------------------|----------------------------------|
| CA                     | 1-8                              |
| 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 3-27. DSPU5 Fuses**

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



**Table 3-28. Sync and Main Controller (Single-Bay)**

| <b>Synchronizer</b>             |                                             | <b>Main Controller</b>          |                                             |
|---------------------------------|---------------------------------------------|---------------------------------|---------------------------------------------|
| <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
|                                 | 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 3-29. Power Unit Requirements**

| <b>Power<br/>Unit<br/>Code</b> | <b>Output<br/>Requirement<br/>(DC Volts)</b> | <b>Meter Connections</b> |                          |
|--------------------------------|----------------------------------------------|--------------------------|--------------------------|
|                                |                                              | <b>Positive<br/>Lead</b> | <b>Negative<br/>Lead</b> |
| SM565                          | +11.75 to +12.25                             | +V2                      | RTN                      |
|                                | −11.75 to −12.25                             | −V2                      | 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 Plug-Ins, Grow, and Restore FTU/IFTU

---

### Overview

The following must be performed in order to bring the FTU/IFTU shelf In-Service:

1. Install FTM circuit packs
  2. Grow the FTU/IFTU
  3. Restore the ECCN/CCN
  4. Restore the UC
  5. Grow and restore the FTM circuit packs.
- 

### Install FTM Circuit Packs (FTMIs and FCs)

#### FTU Versions

The three versions of the FTU are:

- FTU
- IFTU
- IFTU2.

These units are illustrated in Figure 3-13, Figure 3-14, and Figure 3-15.

---

(Continued on next page)

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

### Install FTM Circuit Packs (FTMIs and FCs), Continued

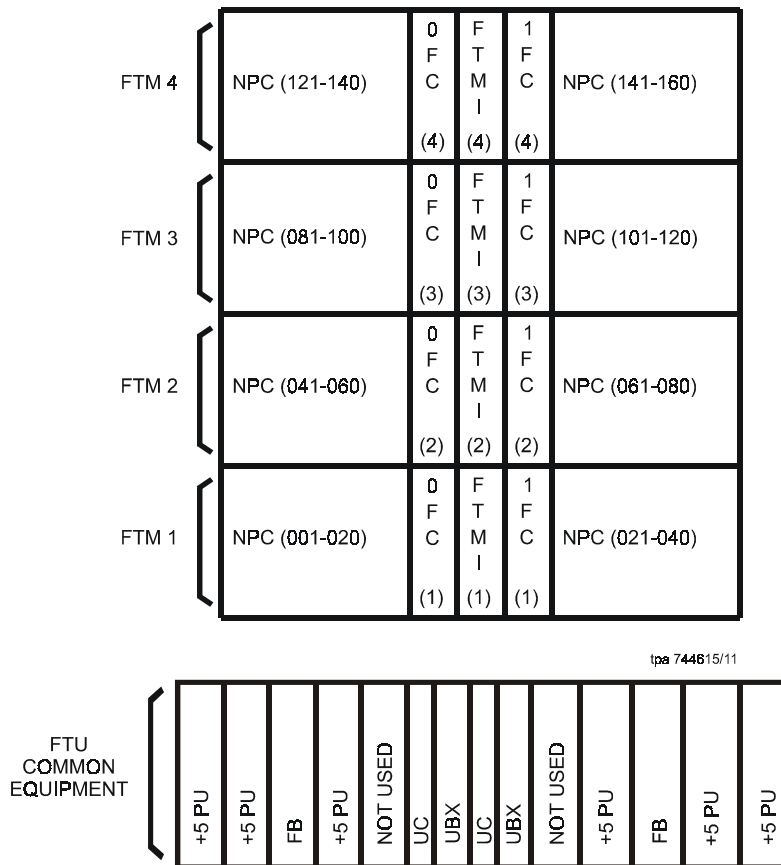
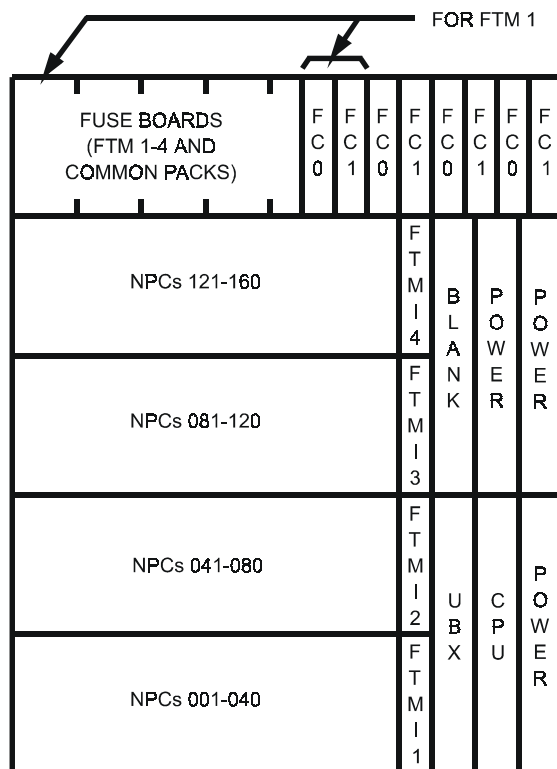


**Figure 3-13. Original FTU**

(Continued on next page)

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

## Install FTM Circuit Packs (FTMIs and FCs), Continued



tpa 789371/11

**Figure 3-14. Integrated Facility Terminating Unit ED9C004-30 G1 or G2**

(Continued on next page)

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

### Install FTM Circuit Packs (FTMIs and FCs), Continued

| FUSE BOARDS<br>1-17 |                 |             |                       |             | P<br>O<br>W<br>E<br>R<br>1 | P<br>O<br>W<br>E<br>R<br>2 | P<br>O<br>W<br>E<br>R<br>3 |
|---------------------|-----------------|-------------|-----------------------|-------------|----------------------------|----------------------------|----------------------------|
| FTM 4               | NPCs<br>121-140 | F<br>C<br>0 | F<br>T<br>M<br>I<br>4 | F<br>C<br>1 | NPCs<br>141-160            | BLANK                      |                            |
| FTM 3               | NPCs<br>80-100  | F<br>C<br>0 | F<br>T<br>M<br>I<br>3 | F<br>C<br>1 | NPCs<br>101-120            |                            |                            |
| FTM 2               | NPCs<br>41-60   | F<br>C<br>0 | F<br>T<br>M<br>I<br>2 | F<br>C<br>1 | NPCs<br>61-80              | U<br>B<br>X                | C<br>P<br>U                |
| FTM 1               | NPCs<br>1-20    | F<br>C<br>0 | F<br>T<br>M<br>I<br>1 | F<br>C<br>1 | NPCs<br>21-40              |                            |                            |

**Figure 3-15. Integrated Facility Terminating Unit 2 ED9C004-30 G3**

(Continued on next page)

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

### Install FTM Circuit Packs (FTMIs and FCs), Continued

#### NPC Codes and Types

Each circuit pack contains the circuitry for two NPCs. Various NPC circuit packs and NPC types are available to provide a variety of required line interface and functions.

#### NPC Locations

Use Table 3-30 to determine the NPC numbers in each unit and facility terminating module (FTM).



#### NOTE:

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

**Table 3-30. NPC Location in Unit**

| Nonhierarchical NPC Number | Unit Number | FTMI Number |
|----------------------------|-------------|-------------|
| 001-040                    | 1           | 1           |
| 041-080                    | 1           | 2           |
| 081-120                    | 1           | 3           |
| 121-160                    | 1           | 4           |
| 161-200                    | 2           | 1           |
| 201-240                    | 2           | 2           |
| 241-280                    | 2           | 3           |
| 281-320                    | 2           | 4           |
| 321-360                    | 3           | 1           |
| 361-400                    | 3           | 2           |
| 401-440                    | 3           | 3           |
| 441-480                    | 3           | 4           |
| 481-520                    | 4           | 1           |
| 521-560                    | 4           | 2           |
| 561-600                    | 4           | 3           |
| 601-640                    | 4           | 4           |

**Table 3-30. NPC Location in Unit (Continued)**

| <b>Nonhierarchical NPC Number</b> | <b>Unit Number</b> | <b>FTMI Number</b> |
|-----------------------------------|--------------------|--------------------|
| 641-680                           | 5                  | 1                  |
| 681-720                           | 5                  | 2                  |
| 721-760                           | 5                  | 3                  |
| 761-800                           | 5                  | 4                  |
| 801-840                           | 6                  | 1                  |
| 841-880                           | 6                  | 2                  |
| 881-920                           | 6                  | 3                  |
| 921-960                           | 6                  | 4                  |
| 961-1000                          | 7                  | 1                  |
| 1001-1040                         | 7                  | 2                  |
| 1041-1080                         | 7                  | 3                  |
| 1081-1120                         | 7                  | 4                  |
| 1121-1160                         | 8                  | 1                  |
| 1161-1200                         | 8                  | 2                  |
| 1201-1240                         | 8                  | 3                  |
| 1241-1280                         | 8                  | 4                  |
| 1281-1320                         | 9                  | 1                  |
| 1321-1360                         | 9                  | 2                  |
| 1361-1400                         | 9                  | 3                  |
| 1401-1440                         | 9                  | 4                  |
| 1441-1480                         | 10                 | 1                  |
| 1481-1520                         | 10                 | 2                  |
| 1521-1560                         | 10                 | 3                  |
| 1561-1600                         | 10                 | 4                  |
| 1601-1640                         | 11                 | 1                  |
| 1641-1680                         | 11                 | 2                  |
| 1681-1720                         | 11                 | 3                  |
| 1721-1760                         | 11                 | 4                  |
| 1761-1800                         | 12                 | 1                  |

**Table 3-30. NPC Location in Unit (Continued)**

| <b>Nonhierarchical NPC Number</b> | <b>Unit Number</b> | <b>FTMI Number</b> |
|-----------------------------------|--------------------|--------------------|
| 1801-1840                         | 12                 | 2                  |
| 1841-1880                         | 12                 | 3                  |
| 1881-1920                         | 12                 | 4                  |
| 1921-1960                         | 13                 | 1                  |
| 1961-2000                         | 13                 | 2                  |
| 2001-2040                         | 13                 | 3                  |
| 2041-2080                         | 13                 | 4                  |
| 2081-2120                         | 14                 | 1                  |
| 2121-2160                         | 14                 | 2                  |
| 2161-2200                         | 14                 | 3                  |
| 2201-2240                         | 14                 | 4                  |
| 2241-2280                         | 15                 | 1                  |
| 2281-2320                         | 15                 | 2                  |
| 2321-2360                         | 15                 | 3                  |
| 2361-2400                         | 15                 | 4                  |
| 2401-2440                         | 16                 | 1                  |
| 2441-2480                         | 16                 | 2                  |
| 2481-2520                         | 16                 | 3                  |
| 2521-2560                         | 16                 | 4                  |



---

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

---

### Grow FTU/IFTU

Growing the FTU places the unit in the data base and defines the type of application (FTU/IFTU). The associated ETSI in the cross-connect network is automatically grown when the FTU is grown. This is 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 procedure will be denied (INERR BAD ARG).

---

### Restore ECCN and CCN

The DACS II will either have an ECCN or a CCN to restore. When the ECCN/CCN is restored, it will establish communications within the network and enables the restoral of the next pack in the list.

When restoring the CCI pack on the ECCN/CCN, the two BTs (bus terminators) for the shelf will automatically be restored. This is indicated in the completion message.

---

### Restore UC

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

---

## Install Plug-Ins, Grow, and Restore FTU/IFTU (Continued)

### Grow FTMI

When growing the FTMI, the FTMI is placed in the database. If TYPE DE NPCs are going to be installed in the module for 1.544-Mb/s lines, the setting for the line signal equalizers in the transmit direction is specified. If TYPE PB/PC PBCs are going to be installed in the module for 2.048-Mb/s lines, the impedance of the line interfaces (either 75-ohm coaxial or 120-ohm twisted wire) is specified. The associated FCs are automatically grown when the FTMI is grown.

The equalizer settings for the DACS II are based on the line cable length from the DACS II to the line-jack bay. These values are listed in Table 3-31.

**Table 3-31. DS1 (1.544 Mb/s) Equalizer Settings**

| Setting | Cable Length (22 Gauge) | Cable Length (26 Gauge) |
|---------|-------------------------|-------------------------|
| 1       | 0 through 133 feet      | 0 through 90 feet       |
| 2       | 133 through 267 feet    | 90 through 180 feet     |
| 3       | 267 through 400 feet    | 180 through 270 feet    |
| 4       | 400 through 533 feet    | 270 through 360 feet    |
| 5       | 533 through 655 feet    | 360 through 450 feet    |

### Restore FTMI and FCs

The FMTI and FCs must be restored in the correct order to establish communications with the unit and enable 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.



**NOTE:**

The FTMI must also be restored to service after the impedance is changed and before NPCs can be added to service.

---

## Remove and Degrow FTU/IFTU

---

### Overview

This section provides information to support procedures for removing IFTU (integrated facility terminating unit) or FTU (facility terminating unit) circuit packs from service and to degrow the unit.

---

### Deprovisioning Tips

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). However, the UC must be in-service to use other commands. Therefore, the unit components must be removed and degrown in the following order:

1. The NPCs in the unit are removed and degrown

NPCs can be physically removed from the unit after they are removed from service. After degrowing a pack or group, it can be regrown with different specifications.

2. FTMI is removed and degrown

The FCs on both sides will be removed with the FTMI degrowth command.

3. The UC is removed and degrown.

The associated and ETSIs (or CCBs) and TSIs on both sides of the unit will **automatically** be removed and degrown.

---

---

## **Install Circuit Packs, Grow and Restore DS3U or HDS3U**

---

### **Overview**

The following must be performed in order to bring the DS3U or HDS3U shelf In-Service:

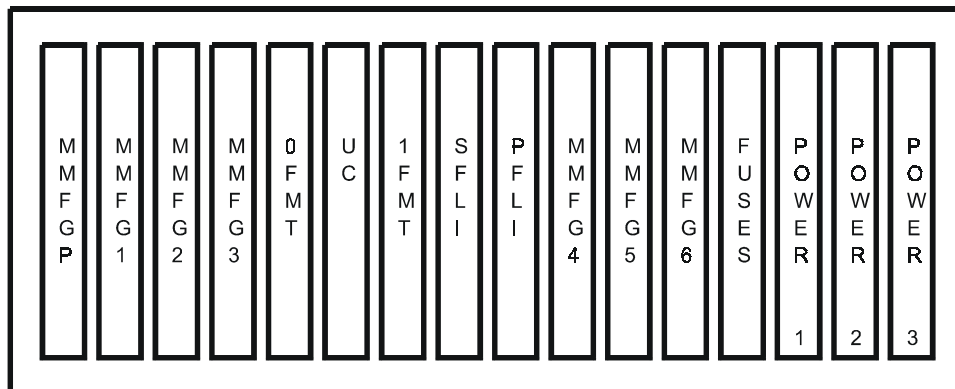
1. Install DS3U/HDS3U common equipment and protection MMFG
  2. Grow DS3U/HDS3U common equipment and protection MMFG
  3. Activate/Deactivate DS3 Unprotected Service Alarm
  4. Restore the ECCN/CCN
  5. Restore the UC
  6. Grow the service and protection MMFG(s)
  7. Grow and restore the MIU(s)
  8. Restore the service and protection MMFG(s).
-

## Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)

### Install Common Equipment and Protection MMFG

### MMFG Positions

Figure 3-16 illustrates the designated positions on the DS3U/HDS3U shelf. Each MMFG (MXR function group) position shown in the DS3U/HDS3U consists of MXR/HMXR (multiplexer) positions and a protection MMFG position.



NOTE: EACH MMFG CONSISTS OF MXR/HMXR AND MIU POSITIONS



**Figure 3-16. Location of MMFGs on DS3U or HDS3U Shelf**

(Continued on next page)

## **Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)**

### **Install Common Equipment and Protection MMFG, Continued**

#### **Power Units**

The DS3U/HDS3U uses 563A power units. Two of the three power units will supply the load, but the third one is required for backup reserve power.

#### **Fuses**

The DS3U/HDS3U uses 77H LED fuses. Table Table 3-32 lists the DS3U/HDS3U fuse assignments.

**Table 3-32. DS3U Fuse Assignment**

| <b>Fuse Designation</b> | <b>Associated CPs</b> |
|-------------------------|-----------------------|
| L                       | P MXR (HMXR)          |
| K                       | 1 MXR (HMXR)          |
| J                       | 2 MXR (HMXR)          |
| I                       | 3 MXR (HMXR)          |
| H                       | 0 FMT (HFMT)          |
| G                       | UC                    |
| F                       | 1 FMT (HFMT)          |
| E                       | S FLI                 |
| D                       | P FLI                 |
| C                       | 4 MXR (HMXR)          |
| B                       | 5 MXR (HMXR)          |
| A                       | 6 MXR (HMXR)          |

---

## **Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)**

---

### **Grow DS3U or HDS3U Common Equipment and Protection MMFG**

This growth operation grows the unit in the database and defines the type of application (FTU, DSPU, DS3U, HDS3U). The following components of the unit are automatically grown when the unit is grown:

- The associated ETSI, or the associated CCBs and TSIs in the cross-connect network
- The FLI S and P
- The FMT 0 and 1
- The protection MXR.

The growth of these components are indicated in the completion message.

When growing an HDS3U, the protection MXR slot must be equipped with an HMXR circuit pack (type HX100).

---

### **Activate/Deactivate DS3 Unprotected Service Alarm**

This operation can either activate or deactivate a minor alarm that will be generated when DS3 service is left manually unprotected. This alarm is applicable only to the FLI, MMFG, and UC circuit packs. This alarm is activated by default.

---

### **Restore ECCN/CCN**

The DACS II will either have an ECCN or a CCN to restore. When the ECCN/CCN is restored, it will establish communications within the network and enables the restoral of the next pack in the list.

When restoring the CCI pack on the ECCN/CCN, the two BTs (bus terminators) for the shelf will automatically be restored. This is indicated in the completion message.

---

### **Restore UC**

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

---

## **Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)**

### **Restore DS3U or HDS3U Common Equipment**

Before the DS3U or HDS3U common equipment is restored, the ECCN/CCN and unit UC must be grown and restored.

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.

### **Grow MMFG [MXR (KCR-1), EMXR (KCR-5), or HMXR (KCR8)]**

This growth operation is used to specify 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 database.

#### **MXR Types**

The MXR/HMXR circuit types are listed in Table 3-33.

**Table 3-33. MXR Types**

| <b>MXR Type</b> | <b>Description</b>                                                                      |
|-----------------|-----------------------------------------------------------------------------------------|
| MX100           | KCR-1 circuit pack with M13 framing                                                     |
| MX200           | KCR-1 circuit pack with C-bit parity framing                                            |
| EX100           | KCR-5 circuit pack with M13 framing                                                     |
| EX200           | KCR-5 circuit pack with C-bit parity framing                                            |
| HX100           | KCR-8 hybrid circuit pack with M13 framing                                              |
| HX110           | KCR-8 hybrid circuit pack with M13 framing and a reverse interpretation of X-bit values |

(Continued on next page)



## Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)

**Grow MMFG  
[MXR (KCR-1),  
EMXR (KCR-5), or  
HMXR (KCR8)],  
Continued**

### Maintenance and Protection Keywords

When retrieving a report on the maintenance and protection status of the MMFG, refer to Table 3-34 for an explanation of the keywords used in the report.

**Table 3-34. Maintenance and Protection Keywords**

| Keyword                        | Meaning                                                          |
|--------------------------------|------------------------------------------------------------------|
| <b>Maintenance Status</b>      |                                                                  |
| IS                             | In-Service                                                       |
| ISF                            | In-Service, but Failed and Pested                                |
| OOS                            | Out-Of-Service                                                   |
| UEQD                           | Unequipped                                                       |
| <b>Protection Status</b>       |                                                                  |
| 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 Is Allowed   |
| APALW                          | Auto Protection Switch Active and Auto Switchback Is Allowed     |
| MPINH                          | Manual Protection Switch Active and Auto Switchback Is Inhibited |
| APINH                          | Auto Protection Switch Active and Auto Switchback Is Inhibited   |
| (dashes)                       | Service MMFG Not Equipped                                        |
| <b>Protection Availability</b> |                                                                  |
| AVL                            | Available for Switching                                          |
| NVL                            | Not Available for Switching                                      |
| (dashes)                       | MMFG Not Selected for Service                                    |

---

## **Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)**

---

### **Grow MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)**

This growth operation places 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.

---

### **Restore MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)**

This restore operation can restore to service 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).

---

### **Restore Protection MMFG and Service MMFG**

This restore operation changes 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 the MMFG and service MMFG are 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.

If the INCL keyword is used, 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.

---

---

## Install Circuit Packs, Grow and Restore DS3U or HDS3U (Continued)

---

### Change DS3 MXR/ HDS3 HMXR Parameters

This operation changes the type specification and any operating options of an MXR or HMXR pack that has been already grown in the database. These options are:

- **BERM** - Bit Error Rate Calculation
- **BERT** - Bit Error Rate Threshold
- **LBO** - Line Build-Out Setting
- **TYPE** - The DS3 or HDS3 facility type and framing format.

The MXR or HMXR and facility must be removed from service to change the type specification; this is accomplished by removing the MMFG for the MXR or HMXR.

---

### Change Alarm Activate Integration Time

The alarm activate integration time is the duration between a DS3 LOS/OOF/AIS/IDLE/BER alarm and the display of its corresponding alarm message. This operation provides the ability to change this alarm activate integration time within the range between 2 and 10 seconds. The DACS II can be set to generate alarm idle messages for alarms that persist for less than 10 seconds. This applies to all Hybrid/DS3 units and the MXR, EMXR, and HMXR multiplexers.

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---

## Remove and Degrow DS3U or HDS3U

---

### Overview

This section provides information to support procedures for removing DS3U or HDS3U circuit packs from service and to degrow the unit. However, the UC must be in-service to use other commands. Therefore, the unit components must be removed and degrown in the following order:

1. The NPCs in the unit are removed  
NPCs can be physically removed from the unit after they are removed from service.
2. The FMT is removed
3. The service MMFG circuit packs are removed
4. The protection MMFG is removed
5. The protection MIU is removed
6. The NPCs in the unit are degrown  
After degrowing a pack or group, it can be regrown with different specifications.
7. The MIU is degrown (if equipped)
8. The MXR is degrown
9. The protection MIU is degrown
10. The FLI is removed (service and then protection)
11. The UC is removed
12. The unit is removed and degrown.

The protection MXR and UC will automatically be degrown. Also, the associated and ETSI (or CCB and TSIs) and FMTs on both sides of the unit will **automatically** be removed and degrown.

There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

**NOTE:**

Performing this procedure incorrectly can interrupt service. Familiarize yourself with the procedure and commands before beginning and perform each step of the procedure in the order given.

---

## Remove and Degrow DS3U or HDS3U (Continued)

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### Deprovisioning Tips

When removing and degrowing a DS3U/HDS3U:

- When unit packs are removed from service and the unit UC is degrown, the following will automatically be removed and degrown:
  - DS3U FMTs (or HDS3U HFMTs)
  - ETSI or CCB and TSIs
  - FLI S (service) and FLI P (protection)
  - MXR P.

This will occur only if the associated packs are not supporting cross-connections or other packs (subentities).

- For DS3 unit, an unprotected FLI can only be removed when all the following are true:
    - No service MXR is grown
    - The protection MXR (multiplexer) is not grown
    - The protection MIU (multiple interface unit) is out-of-service.
  - If there are no service cross-connections on the DS3U/HDS3U, you can opt to expedite the unit degrowth by using one command to:
    - Remove all NPCs on the MMFG (MIU-MXR function group)
    - Remove a range of MMFGs.
-

## Install Circuit Packs, Grow and Restore DSPU

### Overview

The following must be performed in order to bring the DSPU shelf In-Service:

1. Install DSPI and CPU circuit packs
2. Grow the DSPU
3. Restore the ECCN/CCN
4. Restore the UC
5. Restore the DSPI.

### Install DSPI and CPU Circuit Packs

Figure 3-17 illustrates the designated positions on the DSPU shelf.



**Figure 3-17. DSPU Shelf**

---

## **Install Circuit Packs, Grow and Restore DSPU (Continued)**

---

### **Grow DSPU**

This growth operation grows the unit in the database 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. This is indicated in the completion message.

---

### **Restore ECCN/CCN**

The DACS II will either have an ECCN or a CCN to restore. When the ECCN/CCN is restored, it will establish communications within the network and enables the restoral of the next pack in the list.

When restoring the CCI pack on the ECCN/CCN, the two BTs (bus terminators) for the shelf will automatically be restored.

---

### **Restore UC**

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

---

### **Restore DSPI**

The DSPI is the interface between the UC and te DSP circuit packs. Restoring the DSPI will enable the DSP operation.

---

### **Change DS1 Equalizer Value**

This operation is used to change or correct the value of the equalizers for the facility terminating module. The equalization for each half of the shelf, which contains 10 dual digroup cards, can be set to different values. This operation can also be used to enter the value for the second half of the shelf if it was not entered initially. The FTMI must be in-service to change an equalizer value.

The equalization values are found in Table 3-31.

---

## Install Circuit Packs, Grow and Restore DSPU (Continued)

### Change DS1 Equalizer Value on 19.2-Kbit/s MJU Circuit Pack

The DS1 equalization is set on the 19.2-Kbit/s MJU circuit pack by adjusting the DIP switch rockers on the SW1 switch of the MJU circuit board. To set a switch to the on position, push the rocker to the 1 position. Table 3-35 lists the 19.2 Kbit/s equalization settings.

**Table 3-35. 19.2-kb/s Equalization Settings**

| Cable Length (Feet) |                    | Switch Setting |          |          |
|---------------------|--------------------|----------------|----------|----------|
| Type 609 (22 GA.)   | Type 1249 (26 GA.) | Rocker 1       | Rocker 2 | Rocker 3 |
| 0 through 50        | 0 through 90       | on             | on       | on       |
| 51 through 267      | 91 through 180     | on             | on       | off      |
| 268 through 400     | 181 through 270    | on             | off      | on       |
| 401 through 533     | 271 through 360    | on             | off      | off      |
| 534 through 655     | 361 through 450    | off            | on       | on       |

The selected equalization will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and will be read again whenever the **RESET** button on the circuit pack is operated.



---

## Remove and Degrow DSPU

---

### Overview

This section provides information to support procedures for removing DSPU (digital signal processing unit) circuit packs from service and to degrow the unit. However, the UC must be in-service to use other commands. Therefore, the unit components must be removed and degrown in the following order:

1. The NPCs in the unit are removed and degrown.

NPCs can be physically removed from the unit after they are removed from service. After degrowing a pack or group, it can be regrown with different specifications.

2. The UC is removed and degrown.

The associated and ETSIs (or CCBs) and TSIs on both sides of the unit will **automatically** be removed and degrown.

There are also commands to remove all the ETSIs or TSIs per side to expedite troubleshooting.

---

### Deprovisioning Tips

When removing and degrowing the DSPU:

- 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 DISCONNECT NPC command removes both NPC sides from service and degrows the NPC; the REMOVE command is not used.
-

## NPC

### Overview

This section provides information for installing, growing, restoring, and changing the options or parameters for various NPC types.

## Set Optional Alarm Threshold in Data Base

### Overview

This operation 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 CRTE or ED commands. If the alarm thresholds for an NPC are not specified, the internal default values apply. Different alarm types apply to the NPCs for DS1 and 2.048-M/bs Interface.

### NPC Options

Table 3-36 lists the setup options for various NPC types.

**Table 3-36. DE/DS/TE/PB/PC Type Setup Options**

| NPC Type     | Option (rr) | Performance Parameter                | Threshold Range      | Default Value |
|--------------|-------------|--------------------------------------|----------------------|---------------|
| DE/TE/<br>DS | 01          | SLIP Major Alarm                     | 001-255              | 255           |
|              | 02          | SLIP Minor Alarm                     | 001-255              | 4             |
|              | 03          | Bit Error Rate Major Alarm           | 10u-6d to 10u-3d *   | 10u-3d †      |
|              | 04          | Bit Error Rate Minor Alarm           | 10u-6d to 10u-3d * † | 10u-6d        |
|              | 05          | Errored Seconds (T1DM & ESF Formats) | 00001-65535          | 864           |
|              | 06          | Severely Errored Seconds             | 001-255              | 255           |
|              | 07          | COFA Major Alarm                     | 001-511              | 511           |
|              | 08          | COFA Minor Alarm                     | 1-255                | 17            |
| DS           | 09          | SANE (Self Alarm - Near End)         | 0-65535              | 0             |
| only         | 10          | SAFE (Self Alarm - Far End)          | 0-65535              | 0             |

**Table 3-36. DE/DS/TE/PB/PC Type Setup Options (Continued)**

| <b>NPC Type</b> | <b>Option (rr)</b> | <b>Performance Parameter</b>               | <b>Threshold Range</b> | <b>Default Value</b> |
|-----------------|--------------------|--------------------------------------------|------------------------|----------------------|
| 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                  |
| PB/PC           | 38                 | US, Unavailable Seconds, 24 hours          | 1-65535                | 65535                |
|                 | 39                 | SLIPS, 15 minutes                          | 1-900                  | 900                  |
|                 | 40                 | SLIPS, 24 hours                            | 1-65535                | 65535                |

\* Range is  $10^{-7}$  to  $10^{-3}$  with ESF or T1DM line format.

† Range is  $10^{-6}$  to  $10^{-4}$  (default) for clear-DS1.

---

## Install Circuit Packs, Grow and Restore IFTU2 NPC (Without SLC<sup>®</sup> Carrier)

---

### Overview

This process is used to:

- Enter information (grow) into the database
- Provision as IFTU2 NPCs
- Bring the NPCs into service.

---

### Install Circuit Packs and Grow Type DE NPC

DE-type NPCs are enhanced DS1 digroups with increased performance monitoring capability. The growth operation defines the operating characteristics of the NPC in the database. When the NPC is subsequently restored to service, it will be provisioned per the growth specification. Included in the specification are:

- DS1 line and channel formats
- Facility alarm thresholds
- The channel insertion word.

The DS1 line formats are given by the TYPE specification; TYPE DE100 is the default. If used, alarm threshold options must already be defined in the database per *Set Optional Alarm Threshold in Data Base*. The IW (insertion word) for the NPC is sent out on all channels when the NPC is removed from service and, unless overridden by the DCC option in the disconnect command(s), the IW is sent on any non-connected channel.

### DE-Type NPC Information

The list below indicates the appropriate tables to find NPC and alarm information.

| Description                                     | Table      |
|-------------------------------------------------|------------|
| DE-Type NPC Options                             | Table 3-37 |
| DE-Type Alarm Parameters                        | Table 3-38 |
| DE-Type Alarm Threshold Values (Optional field) | Table 3-39 |
| DE-Type NPC Option Types                        | Table 3-40 |

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(Continued on next page)

**Table 3-37. DE Type NPC Options**

|          |                                         |
|----------|-----------------------------------------|
| <b>X</b> | <b>Multiframe Format</b>                |
| 0        | Unassigned                              |
| 1        | D4 Channel Bank                         |
| 2        | Extended Super Frame - Voice            |
| 3        | Extended Super Frame - Data             |
| 4        | DDS T1DM Word 24                        |
| 5-7      | Unassigned                              |
| 8        | Ericson Cellular Framing Format         |
| 9        | No Framing, Clear-DS1                   |
| <b>Y</b> | <b>Zero Suppression</b>                 |
| 0        | Zero Code Suppression (ZCS)             |
| 1        | No Zero Code Suppression                |
| 2        | Bipolar with 8 Zero Substitution (B8ZS) |
| 3        | ZBTSI for TG186 Pack and ESF Format     |
| 4        | DMI with ZCS                            |
| 5        | DMI with no ZCS                         |
| 6        | DMI with B8ZS                           |
| <b>Z</b> | <b>Channel Counting</b>                 |
| 0        | D4 Channel Numbering (Sequential)       |
| 1        | D2 Channel Numbering                    |
| 2        | D1D Channel Numbering                   |
| 3-8      | Unassigned                              |
| 9        | No Channels, Clear-DS1                  |

**Table 3-38. Alarm Parameters**

| Type (rr,ss,tt,...) | Meaning                                       |
|---------------------|-----------------------------------------------|
| 01                  | SLIPs, Major Alarm                            |
| 02                  | SLIPs, Minor Alarm                            |
| 03                  | BER (bit error rate), Major Alarm             |
| 04                  | BER, Minor Alarm                              |
| 05                  | ERS (errored seconds) T1DM and ESF Formats    |
| 06                  | SERS (severely errored seconds)               |
| 07                  | COFA (change of frame alignment), Major Alarm |
| 08                  | COFA, Minor Alarm                             |

**Table 3-39. DS1 Option Selection**

| Option (l,m,n) | Meaning                    |
|----------------|----------------------------|
| 0              | Default Value              |
| 1              | First Option Value (set1)  |
| 2              | Second Option Value (set2) |
| 3              | Third Option Value (set3)  |

**Table 3-40. Option Types**

| Term      | Explanation                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------|
| ESF       | Extended superframe (24-frame); bit 193 shared for framing, 4 kb/s data link, and 2 kb/s cyclic redundancy check (CRC-6) |
| ESF-voice | Voice with robbed-bit signaling; D4 alarm recognition times; yellow alarm sent over data link                            |
| ESF-data  | Data transmit and additional use of data link; alarm times shorter than D4                                               |
| DDS       | Digital Data System; high reliability special service                                                                    |

**Table 3-40. Option Types (Continued)**

| Term  | Explanation                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDS-T | T1DM type which uses D4 superframe and bit 191 (R bit) data link connection via channel 24                                                                                                                                                                                                                                                                                                                      |
| SLC   | For SLC <sup>®</sup> 96 carrier; 9-state signaling and facility data link                                                                                                                                                                                                                                                                                                                                       |
| ZCS   | Zero code suppression which inserts 1s after strings of 0s for adequate T1 line drive. No ZCS is normally used for data circuits.*                                                                                                                                                                                                                                                                              |
| B8ZS  | Bipolar with 8 zero substitution; for unrestricted data transmit via code for strings of 0s or any general application. This mode eliminates the need for Zero Code Suppression.                                                                                                                                                                                                                                |
| ZBTSl | Zero byte time slot interchange; different algorithm for zero code suppression available with ESF format                                                                                                                                                                                                                                                                                                        |
| DMI   | Digital multiplex interface for digital PBXs (for example, Type 75); uses A and B non-robbed-bit signaling and 64 kb/s channel transmission.                                                                                                                                                                                                                                                                    |
| *     | No ZCS can also be used for voice and wideband program channels where zero code suppression is undesirable and facilities capable of B8ZS line coding are not available. This application requires that digitally encoded voice signals not violate the 1's density requirements of the DS-1 transmission facility (no more than 15 consecutive 0's and an average of 12.5% 1's density) prior to transmission. |

**Alarm Threshold**

When using the optional alarm threshold field when provisioning the NPC, consider the following:

- The errored second parameters are only applicable with the ESF line format and T1DM format.
- Only alarm types 01 through 04 are applicable to IFTU2 clear-DS1s.
- When TG80B is used as clear-DS1, BER is calculated from BPV and the high-end BER threshold is  $10^{-4}$  instead of  $10^{-3}$ .

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## **Install Circuit Packs, Grow and Restore IFTU2 NPC (Without SLC® Carrier) (Continued)**

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### **Install Circuit Packs and Grow Type DE NPC, Continued**

#### **Insertion Word**

If you are going to use the Insertion Word (IW) field when provisioning the NPC, consider the following:

- The two hexadecimal digits define an 8-bit insertion word for unassigned channels. To prevent the generation of a yellow alarm condition (with D4 line format), the hexadecimal number for the left digit must not be one that corresponds to a binary number with bit 2 = 0 (that is, decodes to x0xx).
- Insertion word 7F is defined as the UAC (unassigned channel code) and is typically used for type DE/TE 1yz and type DS NPCs.
- Insertion word 18 is defined as the UMC (unassigned multiplexer code) and is required for a type DE4yz NPC (T1DM format for Digital Data System).
- MUX keyword - IW = IA.
- Insertion word FF is all ones and is used for 2.048-Mb/s Interface NPC applications.

#### **Clear-DS1 NPC y Option**

For a clear-DS1 NPC, the only applicable y options are 1 or 2.

---



## Install Circuit Packs, Grow and Restore IFTU2 NPC (Without SLC<sup>®</sup> Carrier) (Continued)

### Install Circuit Packs and Grow Type DA NPC

This operation is used to enter information (grow) into the database to provision the NPC as a type DA.

#### DA-Type NPC Information

DA-Type NPCs reside on the TG 191 circuit pack.

The list below indicates the appropriate tables to find NPC and alarm information.

| Description                            | Table      |
|----------------------------------------|------------|
| DA-Type NPC Options                    | Table 3-41 |
| DA-Type NPC Facility Parameter Numbers | Table 3-42 |

**Table 3-41. DA-Type NPC xyz Options**

| Bit | Value | Explanation                                    |
|-----|-------|------------------------------------------------|
| x   | 0     | Not assigned                                   |
|     | 1     | D4                                             |
|     | 2     | ESF - voice                                    |
|     | 3     | ESF - data                                     |
|     | 4     | DDST (T1DM - R bit connection via channel 24)  |
|     | 5-7   | Not assigned                                   |
|     | 8     | Ericson Cellular Framing Format                |
|     | 9     | Not assigned                                   |
| y   | 0     | Zero Code Suppression                          |
|     | 1*    | No Zero Code Suppression                       |
|     | 2*    | Bipolar with 8 Zero Substitution               |
|     | 3     | Not assigned                                   |
|     | 4     | Zero Code Suppression/DMI signaling            |
|     | 5     | No Zero Code Suppression/DMI signaling         |
|     | 6     | Bipolar with 8 Zero Substitution/DMI signaling |

**Table 3-41. DA-Type NPC xyz Options (Continued)**

| Bit | Value | Explanation                                      |
|-----|-------|--------------------------------------------------|
| z   | 7-9   | Not assigned                                     |
|     | 0     | D4 channel bank channel numbering                |
|     | 1     | D2 channel bank channel numbering                |
|     | 2     | D1D channel bank channel numbering               |
|     | 3-8   | Not assigned                                     |
|     | 9     | Unchannelized 193-bit Clear Ds1 cross-connection |

\* Options 1 and 2 are only applicable to DA type clear-DS1 NPCs.

**NOTE:**

DMI signaling cannot be specified in the y field if the x field is set to 4 (DDST framing).

**Table 3-42. DA-Type NPC Facility Performance Parameters**

| rr | Parameter                                       |
|----|-------------------------------------------------|
| 41 | Daily near-end path coding violations           |
| 42 | Daily near-end path errored seconds             |
| 43 | Daily near-end path severely errored seconds    |
| 44 | Daily near-end severely errored framing seconds |
| 45 | Daily near-end path controlled slip seconds     |
| 46 | Daily near-end path unavailable seconds         |
| 47 | Daily near-end line coding violations           |
| 48 | Daily near-end line errored seconds             |
| 49 | Daily near-end line severely errored seconds    |
| 50 | Daily far-end path coding violations            |
| 51 | Daily far-end path errored seconds              |
| 52 | Daily far-end path severely errored seconds     |
| 53 | Daily far-end severely errored framing seconds  |
| 54 | Daily far-end path controlled slip seconds      |

**Table 3-42. DA-Type NPC Facility Performance Parameters (Continued)**

| rr | Parameter                                           |
|----|-----------------------------------------------------|
| 55 | Daily far-end path unavailable seconds              |
| 56 | Daily far-end line errored seconds                  |
| 57 | 15-minute near-end path coding violations           |
| 58 | 15-minute near-end path errored seconds             |
| 59 | 15-minute near-end path severely errored seconds    |
| 60 | 15-minute near-end severely errored framing seconds |
| 61 | 15-minute near-end path controlled slip seconds     |
| 62 | 15-minute near-end path unavailable seconds         |
| 63 | 15-minute near-end line coding violations           |
| 64 | 15-minute near-end line errored seconds             |
| 65 | 15-minute near-end line severely errored seconds    |
| 66 | 15-minute far-end path coding violations            |
| 67 | 15-minute far-end path errored seconds              |
| 68 | 15-minute far-end path severely errored seconds     |
| 69 | 15-minute far-end severely errored framing seconds  |
| 70 | 15-minute far-end path controlled slip seconds      |
| 71 | 15-minute far-end path unavailable seconds          |
| 72 | 15-minute far-end line errored seconds              |

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## Install Circuit Packs, Grow and Restore IFTU2 NPC (Without SLC<sup>®</sup> Carrier)(Continued)

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### Install Circuit Pack and Grow DSP Application NPC

DSP application NPCs reside on the TG 193B circuit pack. A single NPC or range of NPCs may be provisioned using one command.

Before growing a DSP Platform application NPC the user must install the application software on the DACS II system. The software installation procedure is documented in the appropriate DSP application manual. The DSP application manuals are:

- *DDS Subrate and MJU Appliucation Manual*
- *X.50/X.57 Subrate Application Manual*
- *DMB Application Manual.*

---

### Restore NPC

Until NPCs are restored to service, facility alarms are not registered and DACS II sends trunk conditioning out over the facility. In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. The looped tests that are included in the diagnostics test the transmission paths in the NPC (except line transformers) and test some of the facility checking circuitry. A hardware failure will cause a failed diagnostic and a restore denial. A facility problem will cause a CGA or PBA alarm.

**NOTE:**

Early TG80s (before Series 5) cannot be grown as clear-DS1.

---

---

## Install Circuit Packs and Grow IFTU2 NPC (with *SLC*<sup>®</sup> Carrier)

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### Overview

This process is used to:

- Enter information (grow) into the database
- Provision as DS-type NPCs
- Bring the NPC into service.

---

### Install Circuit Packs

*SLC* Carrier NPCs are used to terminate a facility that carries signals from a *SLC* Remote Terminal (RT). The *SLC* RT is a separate piece of equipment, external to the DACS II.

#### ***SLC* 96 Carrier Mode III**

When assigning NPC slots and installing NPC circuit packs for *SLC* 96 Carrier Mode III, consider the following:

- All lines from the same RT (remote terminal) should go to the same IFTU2.
- The NPCs for DGA and DGP must be fed by different IFTU2 fuses; each IFTU2 fuse feeds eight NPCs.
- Two digroups from the same RT must connect to different dual digroup cards for service diversity.
- The TG183 (S96D) card must be used for *SLC* carrier digroups carrying the data link (DGA and DGP), but either the TG183 or TG80B can be used for the other *SLC* carrier digroups.

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## Install Circuit Packs and Grow IFTU2 NPC (with *SLC*<sup>®</sup> Carrier) (Continued)

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### Install Circuit Packs, Continued

#### *SLC* 96 Carrier Mode I

When assigning NPC slots and installing NPC circuit packs for *SLC* 96 Carrier Mode I, consider the following:

- All lines from the same RT (remote terminal) must go to the same IFTU2.
- The NPCs for DGA and DGP must be fed by different IFTU2 fuses; each IFTU2 fuse feeds eight NPCs.
- Two digroups from the same RT must connect to different dual digroup cards for service diversity.
- The TG183 (S96D) card must be used for *SLC* carrier digroups carrying the data link (DGA and DGP), but either the TG183 or TG80B can be used for the other *SLC* carrier digroups.
- The NPCs going to DGA at the RT and DCLU must be on the same S96D card.



#### **NOTE:**

There is no DGP at the DCLU, thereby eliminating the protection line between the DCLU and DACS II.

#### *SLC* Series 5 Carrier FPC (Feature Package C) - Retrofit Facility and New Facility

When assigning NPC slots and installing NPC circuit packs for a *SLC* Series 5 Carrier FPC retrofit, consider the following:

- All lines from the same RT must go to the same FTM for *SLC* Series 5 carrier.
- The NPCs for DGA and DGP must be fed by different IFTU2 fuses; each IFTU2 fuse feeds eight NPCs.
- Two digroups from the same RT must connect to different dual digroup cards for service diversity.
- Install TG184 (SS5D card) for *SLC* Series 5 carrier.

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## Install Circuit Packs and Grow IFTU2 NPC (with *SLC*<sup>®</sup> Carrier) (Continued)

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### Install Circuit Packs, Continued

#### *SLC* Series 5 Carrier FPB (Feature Package B)

When assigning NPC slots and installing NPC circuit packs for *SLC* Series 5 Carrier FPB, consider the following:

- All lines from the same RT or DCLU (digital carrier line unit) must go to the same IFTU2.
- The TG183 (S96D) card must be used for *SLC* carrier digroups carrying the data link (DGA and DGP), but either the TG183 or TG80B can be used for the other *SLC* carrier digroups.
- The TG183 (S96D card) must be used for *SLC* Series 5 carrier FPB digroups.
- The NPCs going to DGA at the RT and DGA at the DCLU must be on the same S96D card.
- Two digroups from the same RT (or DCLU) must connect to different S96D cards for diversity.

**NOTE:**

There is no DGP at the DCLU, thereby eliminating the protection line between the DCLU and DACS II.

---

## Install Circuit Packs and Grow IFTU2 NPC (with *SLC*<sup>®</sup> Carrier) (Continued)

### Grow Type DS NPC

This growth operation establishes the following:

- DS1 line formats
- Alarm threshold options
- The channel insertion word.

The NPC records facility slips, bit error rate, errored seconds, severe errored seconds, change of frame alignment and, for *SLC* 96 carrier, records shelf alarms from the RT equipment. Either default values or stored optional values for the alarm thresholds and shelf alarms are selected. These options (not the default values) must first be entered in the database by the ED OPT T1 command. The defined IW (insertion word) for the NPC is sent out on the channels when the NPC is out of service or the channels are not yet cross-connected.

### DS-Type NPC Information

The list below indicates the appropriate tables to find NPC and alarm information.

| Description                     | Table      |
|---------------------------------|------------|
| DS-Type NPC Options             | Table 3-43 |
| DS-Type NPC Facility Thresholds | Table 3-44 |

For *SLC* Series 5 carrier, the same type of zero code suppression (ZCS or B8ZS) must be used at both the DACS II and RT equipment or CRC6 errors can occur on the line.

The y value for the line format will always be as follows:

- y = 0 or 2 for a line going to a *SLC* 96 carrier RT.
- y = 0 for a line going to a *SLC* Series 5 FPB RT.
- y = 0 or 2 for a line going to a *SLC* Series 5 FPC RT.

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**Table 3-43. DS-Type NPC xyz Options**

| <b>Option</b> | <b>Meaning</b>                                    |
|---------------|---------------------------------------------------|
| <b>X</b>      | <b>Multiframe Format</b>                          |
| 0             | Unassigned                                        |
| 1             | D4 bank                                           |
| 2             | ESF (extended superframe) - voice                 |
| 3             | Unassigned                                        |
| 4             | Unassigned                                        |
| 5             | Unassigned                                        |
| 6             | <i>SLC</i> 96 carrier Fs format                   |
| 7             | <i>SLC</i> Series 5 ESF with data link            |
| 8,9           | Unassigned                                        |
| <b>Y</b>      | <b>Zero Code Suppression</b>                      |
| 0             | ZCS (zero code suppression)                       |
| 1             | NZCS (no zero code suppression)                   |
| 2             | B8ZS (bipolar with 8 zero substitution)           |
| 3-9           | Unassigned                                        |
| <b>Z</b>      | <b>Channel Counting Sequence</b>                  |
| 0             | <i>SLC</i> 96 carrier Mode III, D4 bank sequence  |
| 1             | <i>SLC</i> 96 carrier Mode III, D1D bank sequence |
| 2             | <i>SLC</i> 96 carrier Mode I, D1D bank sequence   |
| 3             | <i>SLC</i> Series 5 carrier, D4 bank sequence     |
| 4-9           | Unassigned                                        |

**Table 3-44. DS-Type NPC Facility Thresholds**

| <b>Option (rr)</b> | <b>Parameter</b>                 | <b>Range</b>     | <b>Default</b> |
|--------------------|----------------------------------|------------------|----------------|
| 01                 | SLIP major                       | 000* to 255      | 255            |
| 02                 | SLIP minor                       | 000* to 255      | 4              |
| 03                 | Bit error rate major             | 10u-6d to 10u-4d | 10u-4d         |
| 04                 | Bit error rate minor             | 10u-6d to 10u-4d | 10u-4d         |
| 05                 | Errored seconds                  | 00001 to 65535   | 864            |
| 06                 | Severe errored seconds           | 001 to 255       | 225            |
| 07                 | Change of frame alignment, major | 001 to 511       | 511            |
| 08                 | Change of frame alignment, minor | 001 to 255       | 17             |
| 09                 | Shelf alarm, near end            | 00000 to 65535   | 00000          |
| 10                 | Shelf alarm, far end             | 00000 to 65535   | 00000          |

\* Setting the SLIP threshold to zero suppresses the alarm.

### Framing Formats

The Fs framing format (DS60-) is used for *SLC* 96 carrier and Series 5 FPB: DGA (with data link) and DGP NPCs.

The extended superframe (ESF) line format is required for lines going to *SLC* Series 5 carrier FPC RTs.

## Install, Grow, and Restore DS3U or HDS3U NPC

### Install Circuit Packs and Grow Type TA NPC

TA-type NPCs are used in the EMXR/EMIU slot. TA-type NPCs reside on the KCR5 or KCR6 circuit packs. TA-type NPCs are not allowed with a Hybrid DS3U, even if equipped with KCR5 circuit packs.

When installing a EMXR/EMIU in the service slot, one must also be installed in the protection slot.

### TA-Type NPC Information

The list below indicates the appropriate tables to find NPC and alarm information.

| Description                            | Table      |
|----------------------------------------|------------|
| TA-Type NPC Options                    | Table 3-45 |
| TA-Type NPC Facility Parameter Numbers | Table 3-46 |

**Table 3-45. TA-Type NPC xyz Options**

| Bit | Value | Explanation                                   |
|-----|-------|-----------------------------------------------|
| x   | 0     | Not assigned                                  |
|     | 1     | D4                                            |
|     | 2     | ESF - voice                                   |
|     | 3     | ESF - data                                    |
|     | 4     | DDST (T1DM - R bit connection via channel 24) |
|     | 5-7   | Not assigned                                  |
|     | 8     | Ericson Cellular Framing Format               |
|     | 9     | Not assigned                                  |
| y   | 0     | Zero Code Suppression                         |
|     | 1*    | No Zero Code Suppression                      |
|     | 2     | Not assigned                                  |
|     | 3     | Not assigned                                  |
|     | 4     | Zero Code Suppression/DMI signaling           |
|     | 5     | No Zero Code Suppression/DMI signaling        |

**Table 3-45. TA-Type NPC xyz Options (Continued)**

| Bit                                                      | Value | Explanation                                      |
|----------------------------------------------------------|-------|--------------------------------------------------|
| z                                                        | 6-9   | Not assigned                                     |
|                                                          | 0     | D4 channel bank channel numbering                |
|                                                          | 1     | D2 channel bank channel numbering                |
|                                                          | 2     | D1D channel bank channel numbering               |
|                                                          | 3-8   | Not assigned                                     |
|                                                          | 9     | Unchannelized 193-bit Clear Ds1 cross-connection |
| * Option 1 is only applicable to TA type clear-DS1 NPCs. |       |                                                  |

**⇒ NOTE:**  
DMI signaling cannot be specified in the y field if the x field is set to 4 (DDST framing).

**Table 3-46. TA-Type NPC Facility Performance Parameters**

| rr | Parameter                                       |
|----|-------------------------------------------------|
| 41 | Daily near-end path coding violations           |
| 42 | Daily near-end path errored seconds             |
| 43 | Daily near-end path severely errored seconds    |
| 44 | Daily near-end severely errored framing seconds |
| 45 | Daily near-end path controlled slip seconds     |
| 46 | Daily near-end path unavailable seconds         |
| 50 | Daily far-end path coding violations            |
| 51 | Daily far-end path errored seconds              |
| 52 | Daily far-end path severely errored seconds     |
| 53 | Daily far-end severely errored framing seconds  |
| 54 | Daily far-end path controlled slip seconds      |
| 55 | Daily far-end path unavailable seconds          |
| 57 | 15-minute near-end path coding violations       |
| 58 | 15-minute near-end path errored seconds         |

**Table 3-46. TA-Type NPC Facility Performance Parameters (Continued)**

| <b>rr</b> | <b>Parameter</b>                                    |
|-----------|-----------------------------------------------------|
| 59        | 15-minute near-end path severely errored seconds    |
| 60        | 15-minute near-end severely errored framing seconds |
| 61        | 15-minute near-end path controlled slip seconds     |
| 62        | 15-minute near-end path unavailable seconds         |
| 66        | 15-minute far-end path coding violations            |
| 67        | 15-minute far-end path errored seconds              |
| 68        | 15-minute far-end path severely errored seconds     |
| 69        | 15-minute far-end severely errored framing seconds  |
| 70        | 15-minute far-end path controlled slip seconds      |
| 71        | 15-minute far-end path unavailable seconds          |

---

## Install, Grow, and Restore DS3U or HDS3U NPC (Continued)

---

### Grow Type TE NPCs

TE-type NPCs carry DS1 signals embedded in a DS3 signal.

This growth operation is used to enter the type specifications of the NPCs on the MXR or HMXR pack. The operation is optional if the NPCs were restored with the MXR or HMXR. These NPCs are incorporated in the MXR or HMXR pack and are not separate circuit packs.

The type specification determines the basic operation (TE) and the line and channel formats of the DS1 signal. Optional fields in the growth command allow selecting different facility performance alarm thresholds and specifying a particular insertion word. The IW for the NPC is sent out on all 24 channels when the NPC is out-of-service, and unless set otherwise by a disconnect command, is sent out on any not-connected channel. The IW is not applicable to clear-channel DS1 for which an AIS is sent in the disconnected or idle state.

### TE-Type NPC Information

The list below indicates the appropriate tables to find NPC and alarm information.

| Description                            | Table      |
|----------------------------------------|------------|
| TE-Type NPC Options                    | Table 3-47 |
| TE-Type NPC Facility Parameter Numbers | Table 3-48 |

---

(Continued on next page)

## Install, Grow, and Restore DS3U or HDS3U NPC (Continued)

### Grow Type TE NPCs, Continued

**Table 3-47. TE-Type NPC xyz Options**

| Option   | Type TE                         |
|----------|---------------------------------|
| 0        | Unassigned                      |
| 1        | D4 Bank                         |
| 2        | Extended Super Frame - Voice    |
| 3        | Extended Super Frame - Data     |
| 4        | DDS T1DM Word 24 FDL            |
| 5-7      | Unassigned                      |
| 8        | Ericson Cellular Framing Format |
| 9        | No Framing, Clear-DS1           |
| <b>Y</b> | <b>Zero Suppression</b>         |
| 0        | Zero Code Suppression (ZCS)     |
| 1        | No Zero Code Suppression        |
| 2        | Not Allowed                     |
| 3        | Not Allowed                     |
| 4        | DMI with ZCS                    |
| 5        | DMI with no ZCS                 |
| 6        | Not Allowed                     |
| 7-9      | Unassigned                      |
| <b>Z</b> | <b>Channel Counting</b>         |
| 0        | D4 Bank/Sequential              |
| 1        | D2 Bank                         |
| 2        | D1D Bank                        |
| 3-8      | Unassigned                      |
| 9        | No Channels, Clear-DS1          |

(Continued on next page)

## Install, Grow, and Restore DS3U or HDS3U NPC (Continued)

### Grow Type TE NPCs, Continued

**Table 3-48. TE-Type Facility Parameters**

| Type (rr,ss,tt,...) | Meaning                                       |
|---------------------|-----------------------------------------------|
| 01                  | SLIPs, Major Alarm                            |
| 02                  | SLIPs, Minor Alarm                            |
| 03                  | BER (bit error rate), Major Alarm             |
| 04                  | BER, Minor Alarm                              |
| 05                  | ERS (errored seconds) T1DM and ESF Formats    |
| 06                  | SERS (severely errored seconds)               |
| 07                  | COFA (change of frame alignment), Major Alarm |
| 08                  | COFA, Minor Alarm                             |



**NOTE:**

For clear-DS1, the IW field is not applicable and only SLIP major and minor alarm thresholds can be specified.



## **Install, Grow, and Restore DS3U or HDS3U NPC (Continued)**

---

### **Restore NPCs**

In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. A hardware failure will cause a failed diagnostic and a restore denial.

---

---

## Install, Grow Circuit Packs and Restore DSPU NPC

---

### Overview

This process is used to:

- Enter information (grow) into the database
- Provision as DSPU NPCs
- Bring the NPC into service.

---

### Install DSP NPC Circuit Packs (DMB or Subrate -- SRM, MJU)

When installing DSPU circuit packs, remember to first remove the ECCN side in-service to prevent an alarm (and DSP removal) on other in-service DSPs on the same port.

---

### Grow DSP NPC (DMB or SRM)

The NPCs grown are used for DMBs (digital multipoint bridges) or SRMs (subrate data processing NPCs).

#### DSP NPC Information

For DSP circuits, the pair of NPCs for each DSP card is grown simultaneously by naming the lower NPC number in the command.

Table 3-49 lists the various DSP NPC types.

**Table 3-49. DSP NPC Types**

| NPC Type | Description                           |
|----------|---------------------------------------|
| MB100    | Digital Multipoint Bridge             |
| SR100    | Subrate Data Multiplexer              |
| MJ100    | Subrate Data Multipoint Junction Unit |

---

## Install, Grow Circuit Packs and Restore DSPU NPC (Continued)

---

### Change Substrate Hub ID

The Hub ID (HUBID) is used to identify an MJU tree during test access. The HUBID is comprised of 2 octal digits, each digit can have a value of 0 to 7.

---

### Change Hub ID on 19.2-kb/s MJU Circuit Pack

The HUBID is set on the 19.2-Kbit/s MJU circuit pack by adjusting the DIP switch rockers on the back of the MJU circuit board. To set a switch to the on position, push the rocker to the 1 position. The six rocker positions designated 1 through 6 allow setting Hub ID numbers from 1 to 64. The six rockers correspond to six digits of a binary number (2ud, 2ud, 2ud, 2ud, 2ud, and 2ud which have the values 1, 2, 4, 8, 16, and 32 respectively).

Counting with binary numbers proceeds as follows - 00001, 00010, 00011, 00100, 00101, 00110, 00111, 01000. For higher numbers, you add the selected values together; for example, to represent the number 50, the binary number would be 11010 (32 + 16 + 2).

The selected Hub ID will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and will be read again whenever the **RESET** button on the circuit pack is operated.

---

### Restore DSPU NPC

In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. A hardware failure will cause a failed diagnostic and a restore denial.

With DMB circuit packs, both the NPCs on the circuit pack will be restored when the lower numbered NPC of the pair is entered in the command.

---

---

## Change NPC Parameters

---

### Overview

This operation allows changing an NPC's line format type, the NPC IW (insertion word), and the AIS alarm status for the following NPC types previously discussed:

- DE-Type NPCs
  - TE-Type NPCs
  - DA-Type NPCs
  - DS-Type NPCs
  - TA-Type NPCs.
- 

### Change NPC Type, IW, or ALMOPT-AIS

To change the IW and most NPC type specifications (xyz), the NPC must be removed from service. The insertion word is sent on unassigned (not-connected) channels and all channels when the NPC is removed from service to indicate these conditions to the far-end equipment. To change the IW, the NPC type specification must be reentered. Whenever the NPC type is changed, all programmable alarm thresholds revert to default values and may also have to be changed.

When changing these NPC specifications, consider the following:

- Zero code suppression inserts 1s for adequate line drive as opposed to B8ZS for unrestricted data patterns for multiplexers (the far-end multiplexer removes B8ZS code).
  - The DMI interface for digital PBXs uses both A and B signaling and 64 kb/s clear channel; it cannot be used with DDS where word 24 is needed.
-

---

## Change NPC Parameters (Continued)

---

### Change Alarm Threshold

This operation changes alarm thresholds for any or all the facility parameters for type DE/TE/DS and type PB/PC NPCs. The combined parameters for the NPC types are:

- ERS (errored seconds)
- SERS (severely errored seconds)
- DM (degraded minutes)
- US (unavailable seconds)
- BER (bit error rate)
- COFA (change of frame alignment)
- Slips.

For type DE/TE/DS NPCs, three options can be selected for each associated parameter. For the type PB/PC NPC, three options can be selected for each associated parameter and each alarm class (maintenance information, deferred, or prompt). Command options allow changing the thresholds for only the subject NPC or all NPCs of the same type. To change alarm thresholds, the identifiers for the parameters (any one or all) are listed along with the desired threshold option for each. The threshold values must be previously established using the **ED-OPT-T1** command (refer to *Set Optional Alarm Threshold in Database*).

When changing the alarm threshold values, refer to the alarm parameters and DS1 options listed in Table 3-50 and Table 3-51.

---

(Continued on next page)

**Table 3-50. Alarm Parameters (DE/TE/DS/DA/TA Type NPCs)**

| Type (rr,ss,tt) | Meaning                             |
|-----------------|-------------------------------------|
| 01              | Type DE/TE/DS SLIPs, Major Alarm    |
| 02              | Type DE/TE/DS SLIPs, Minor Alarm    |
| 03              | Type DE/TE/DS BER, Major Alarm      |
| 04              | Type DE/TE/DS BER, Minor Alarm      |
| 05              | Type DE/TE/DS ERS                   |
| 06              | Type DE/TE/DS SERS                  |
| 07              | Type DE/TE/DS COFA, Major Alarm     |
| 08              | Type DE/TE/DS COFA, Minor Alarm     |
| 09              | Type DS SANE                        |
| 10              | Type DS SAFE                        |
| 41              | Type DA/TA Near-end Path CV, Daily  |
| 42              | Type DA/TA Near-end Path ES, Daily  |
| 43              | Type DA/TA Near-end Path SES, Daily |
| 44              | Type DA/TA Near-end SEFS, Daily     |
| 45              | Type DA/TA Near-end CSS, Daily      |
| 46              | Type DA/TA Near-end US, Daily       |
| 47              | Type DA/TA Near-end Line CV, Daily  |
| 48              | Type DA/TA Near-End Line ES, Daily  |
| 49              | Type DA/TA Near-end Line SES, Daily |
| 50              | Type DA/TA Far-end Path CV, Daily   |
| 51              | Type DA/TA Far-end Path ES, Daily   |
| 52              | Type DA/TA Far-end Path SES, Daily  |
| 53              | Type DA/TA Far-end SEFS, Daily      |
| 54              | Type DA/TA Far-end CSS, Daily       |
| 55              | Type DA/TA Far-end US, Daily        |
| 56              | Type DA/TA Far-end Line ES, Daily   |

**Table 3-50. Alarm Parameters (DE/TE/DS/DA/TA Type NPCs) (Continued)**

| Type (rr,ss,tt) | Meaning                               |
|-----------------|---------------------------------------|
| 57              | Type DA/TA Near-end Path CV, 15 Min.  |
| 58              | Type DA/TA Near-end Path ES, 15 Min.  |
| 59              | Type DA/TA Near-end Path SES, 15 Min. |
| 60              | Type DA/TA Near-end SEFS, 15 Min.     |
| 61              | Type DA/TA Near-end CSS, 15 Min.      |
| 62              | Type DA/TA Near-end US, 15 Min.       |
| 63              | Type DA/TA Near-end Line CV, 15 Min.  |
| 64              | Type DA/TA Near-End Line ES, 15 Min.  |
| 65              | Type DA/TA Near-end Line SES, 15 Min. |
| 66              | Type DA/TA Far-end Path CV, 15 Min.   |
| 67              | Type DA/TA Far-end Path ES, 15 Min.   |
| 68              | Type DA/TA Far-end Path SES, 15 Min.  |
| 69              | Type DA/TA Far-end SEFS, 15 Min.      |
| 70              | Type DA/TA Far-end CSS, 15 Min.       |
| 71              | Type DA/TA Far-end US, 15 Min.        |
| 72              | Type DA/TA Far-end Line ES, 15 Min.   |

**Table 3-51. DS1 Option Selection**

| Option (l,m,n) | Meaning                    |
|----------------|----------------------------|
| 0              | Default Value              |
| 1              | First Option Value (set1)  |
| 2              | Second Option Value (set2) |
| 3              | Third Option Value (set3)  |

## Change NPC Parameters (Continued)

### Change Substrate ECLOC

The ECLOC (error correction location) is the type of substrate circuit pack to which all new error correction functions will be allocated. Such resources are allocated for channels requiring parity channel error correction and for circuits with substrate error correction that do not connect to a Substrate multiplexer or a multipoint junction unit.

Error correction is provided by the MJU or SRM circuit pack. Error correction should be assigned to the circuit pack with the most free space (an office with mostly two-point circuits would normally set ECLOC to the MJU circuit pack).

### Query or Change TS0 Bit Monitoring

This operation can perform either one of the following:

- Display the spare bits in TS0 (time slot 0) which are monitored
- Set/change the monitoring.

Once initialized, the DACS II monitors the bits for a change of state and issues an information message when a change occurs.

This monitoring does not interfere with the signal framing at which time the TS0 bits (bits abcdefgh) are used to send the framing word. The normal state, 0 (no monitoring) or 1 (monitoring), of the monitored bits must have been previously set by the **ED-PRMTR-EQPT : NPC-01-1-1 : TS0M-11011111**; command. When a change of state occurs, the DACS II issues a **REPT STATE ...TS0-R BITS** information message. If bits 3, 4 or 5, was assigned an alarm meaning when the NPC was grown, it will generate **REPT STATE ...AR01 MISC PBA** messages when the state changes. Those bits which were assigned when the NPC was grown cannot be selected for monitoring.

Table 3-52 identifies bits abcdefgh.

**Table 3-52. TS0 Bit Meanings**

| 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)                       |



---

## Remove and Degrow NPC

---

### Overview

The process of deprovisioning NPCs involves two major steps:

- Remove a circuit pack
- Degrow a circuit pack.

Removing a circuit pack changes the state of the circuit pack from "EQUIPPED, IN SERVICE" to "EQUIPPED, OUT OF SERVICE". Degrowing a circuit pack changes the state of the circuit pack from "EQUIPPED, OUT OF SERVICE" to "UNEQUIPPED, OUT OF SERVICE".

In-service circuit packs must be removed before physically removing the circuit pack from the DACS II frame. 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.

---

### Removing Cross-connected NPCs

Before deprovisioning an NPC, all active cross-connections must be removed first. 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.

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.

---

### Degrowing NPCs

To expedite degrowing DSPU NPCs, the DISCONNECT NPC command removes both NPC sides from service and degrows the NPC without needing to use the REMOVE command.

---

## Facilities

### Overview

This section provides information which illustrates the proper physical connections between the DS1 facility and other frame components. Also described here is the need to perform basic functionality tests, such as alarm verification and cross-connection capabilities.

---

### Establish DS1 Facility (without *SLC*<sup>®</sup> Carrier)

---

### Overview

Proper verification of wiring connections and cross-connections is important in preventing facility failures.

---

## Establish DS1 Facility (without *SLC*<sup>®</sup> Carrier) (Continued)

**Check Far-End Installation, Make DSX-1 Connections, and Remove Loops**

Use Figure 3-18 to verify that the 48-Volt fuse is at the top of the DSX-bay and TL lamp.

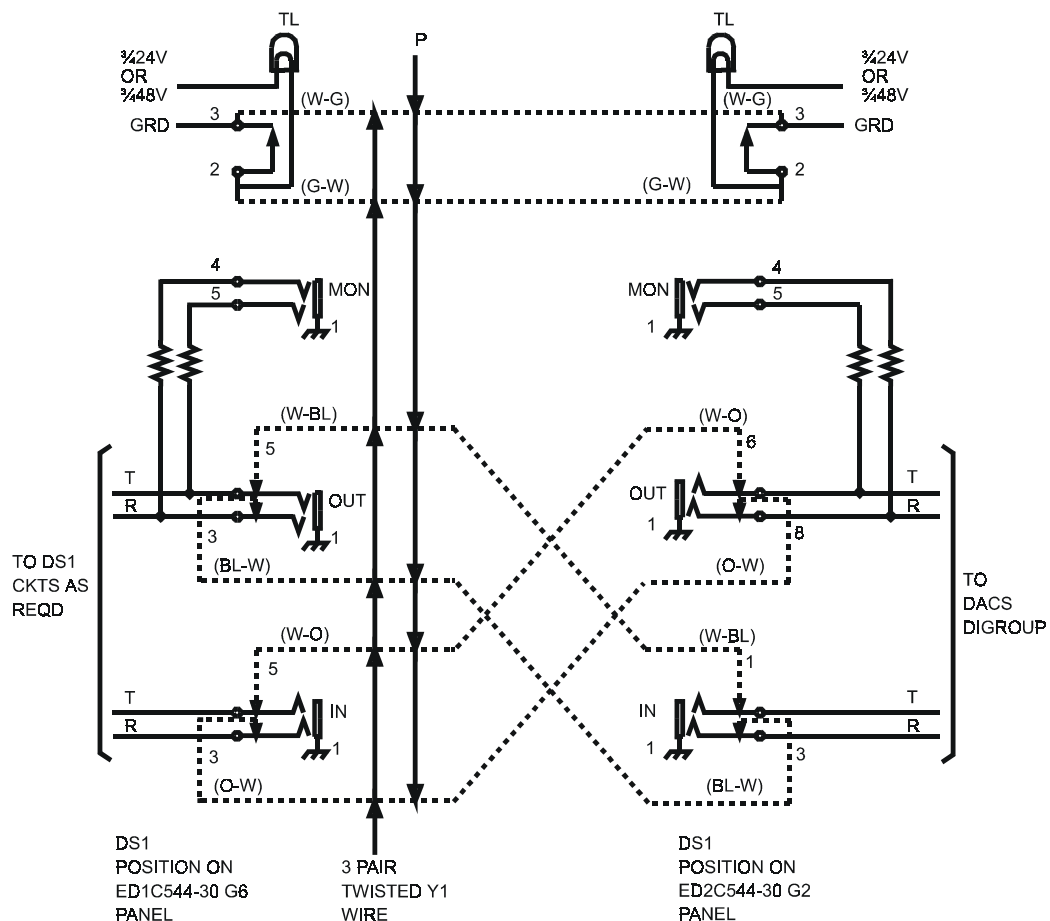


**Figure 3-18. Cross-Connect Schematic**

(Continued on next page)

## Establish DS1 Facility (without *SLC*<sup>®</sup> Carrier) (Continued)

### Check Far-End Installation, Make DSX-1 Connections, and Remove Loops, Continued

Use Figure 3-19 to make the cross-connections between subject jack sets, using Y1-type wire.

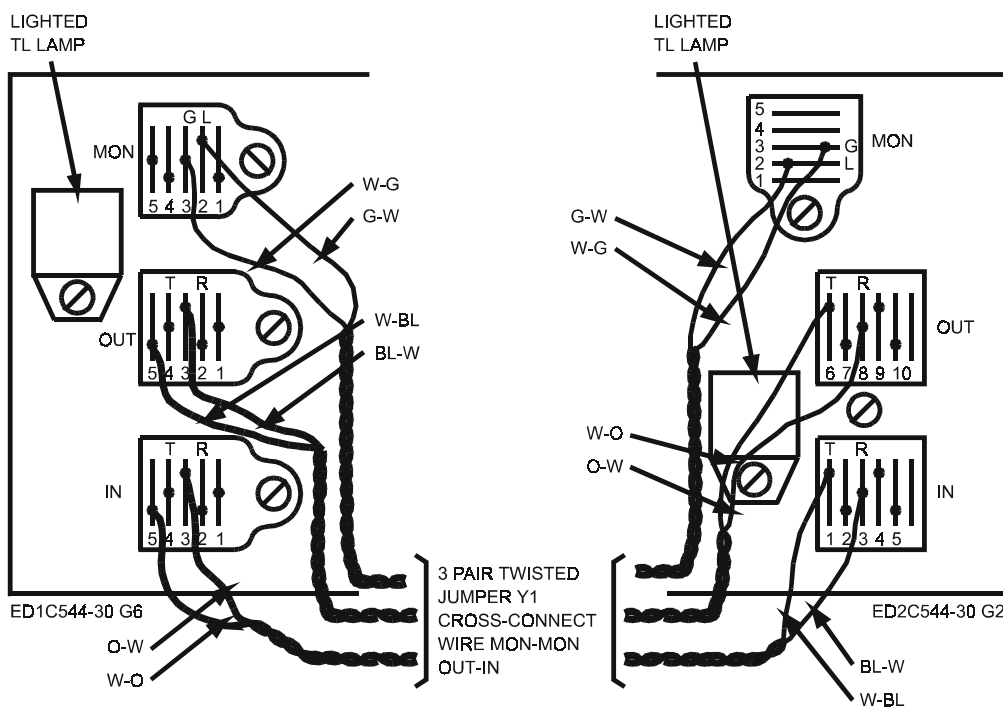


**Figure 3-19. Rear View of 3-Inch Panel**

(Continued on next page)

## Establish DS1 Facility (without *SLC*<sup>®</sup> Carrier) (Continued)

### Check Far-End Installation, Make DSX-1 Connections, and Remove Loops, Continued

Use Figure 3-20 to make the wire-wrap connections between jack sets, using five conductors of the cross-connect wire.

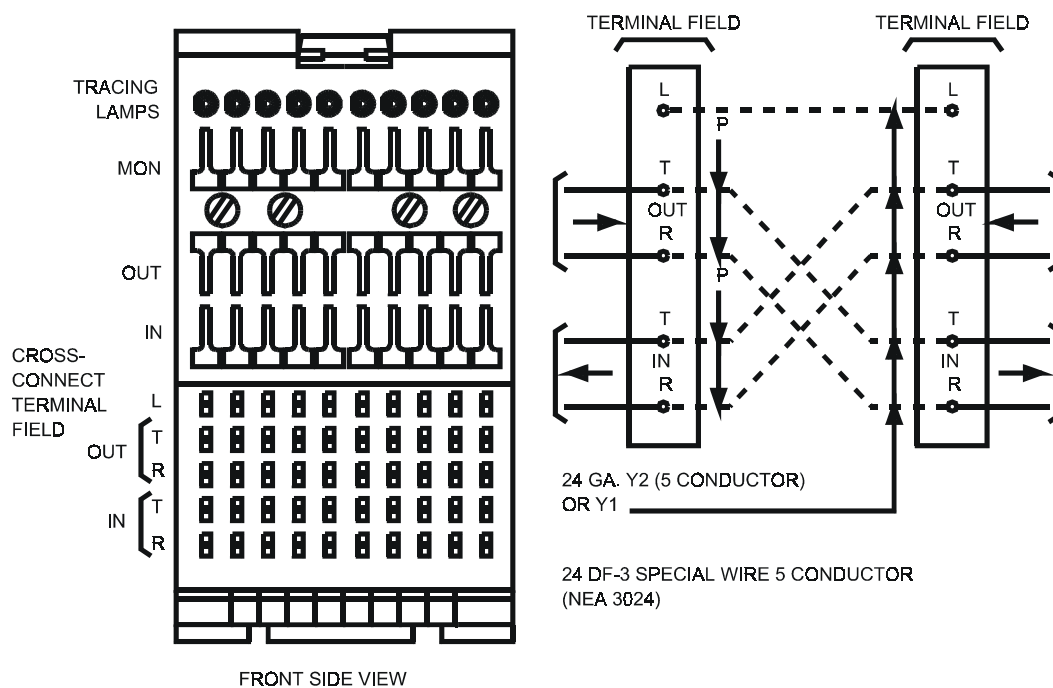


Figure 3-20. 800-Series DSX Details

## Establish DS1 Facility (without *SLC*<sup>®</sup> Carrier)(Continued)

### Perform End-to-End Alarm Tests

In this test, the receive line signal is interrupted to cause a local alarm (CGA) at the DACS II and a remote alarm signal is sent to the other end. The alarms clear after a time-out period when the alarm condition is removed. As a final test, the receive signal is interrupted at the other end to check the local and remote alarm responses in the other direction.

### Check Facility Status and Perform End-to-End Tone Tests

Use Table 3-53 to read the status and facility error counts from the fields of the output message. If there are any out-of-service, failed, or pested NPCs, you may choose to perform channel tests.

**Table 3-53. NPC Status Keywords (Type TE, DE)**

| Keyword       | Meaning                          | Output Information                                                                                                                          |
|---------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| OOS/FAIL/PEST | Out-of-Service/<br>Failed/Pested | 1 = NPC out-of-service/failed/pested                                                                                                        |
| CGA           | Carrier Group Alarm              | R = red alarm,<br>Y=yellow alarm,<br>b=both red and yellow,<br>A = AIS (blue signal),<br>1 = CGA, or 0 = no CGA                             |
| OOF           | Out-of-Frame                     | Count = 0-65535                                                                                                                             |
| SLIP          | Carrier Slips                    | Count = 0-65535,<br>THRESHOLDS = major and minor alarm,<br>OPTIONS = 0-3 for major and minor                                                |
| BER           | Bit Error Rate                   | Alarm status-MJ, MN, CL (no alarm),<br>THRESHOLDS = major and minor<br>(power of 10, -3 or -6),<br>OPTIONS = 0-3 for major and minor alarms |
| ERS           | Errored Seconds                  | Count = 0-65535,<br>THRESHOLDS = 1-900 for 15-min and<br>1-65535 for 24-hr,<br>OPTIONS = 0-3 for thresholds                                 |

**Table 3-53. NPC Status Keywords (Type TE, DE) (Continued)**

| <b>Keyword</b> | <b>Meaning</b>            | <b>Output Information</b>                                                                                |
|----------------|---------------------------|----------------------------------------------------------------------------------------------------------|
| SERS           | Severely Errored Seconds  | Count = 0-65535,<br>THRESHOLDS = 1-900 for 15-min and 1-65535 for 24-hr,<br>OPTIONS = 0-3 for thresholds |
| COFA           | Change of Frame Alignment | Count = 0-65535,<br>THRESHOLDS = major and minor alarms<br>OPTIONS = 0-3 for major and minor thresholds  |
| CRC            | Cyclic Redundancy         | Count = 0-65535                                                                                          |
| BPV            | Bipolar Violation         | Count = 0-65535                                                                                          |
| FRER           | Frame Bit Error           | Count = 0-65535                                                                                          |
| FS             | Failed Seconds            | Count = 0-65535                                                                                          |
| ESF            | Extd Superframe           | Count = 0-65535                                                                                          |
| LFVR           | Line Format               | Count = 0-65535                                                                                          |

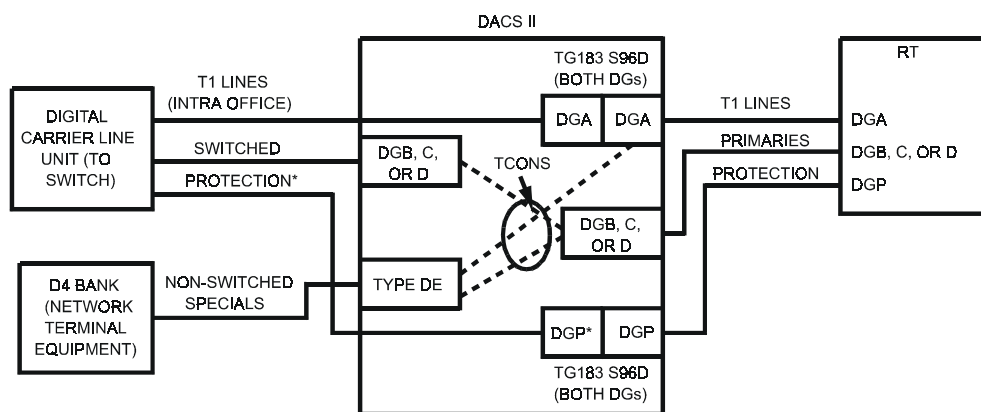
## Establish *SLC*<sup>®</sup> Carrier Systems

### Overview

Proper verification of *SLC* wiring connections and mode configurations is important in preventing facility failures.

### Establish *SLC* 96 Carrier System Mode I or *SLC* Series 5 Carrier System FPB (Feature Package B)

This operation is used to equip the NPC slots for the lines going to the RT, the DCLU, and the nonswitched voice terminal. If protection switching is provided, the NPCs for the protection line are also equipped. There is no protection line between the DCLU and DACS II. See Figure 3-21.



\* PROTECTION LINE BETWEEN DACSII AND DCLU FOR GENERIC 3 AND 4.0 ONLY

**Figure 3-21. Mode I Configuration**

If consecutive NPCs are used for the digroups, all of them can be restored in single range command. Otherwise, the NPCs for DGA can be restored in one command and those for DGP can be restored in one command.



## Establish *SLC*<sup>®</sup> Carrier Systems (Continued)

### Establish *SLC* 96 Carrier System Mode III

This operation is used to equip the NPC slots for the lines going to the RT and the office terminal. If protection switching is provided, the NPCs for the protection line are also equipped. See Figure 3-22.

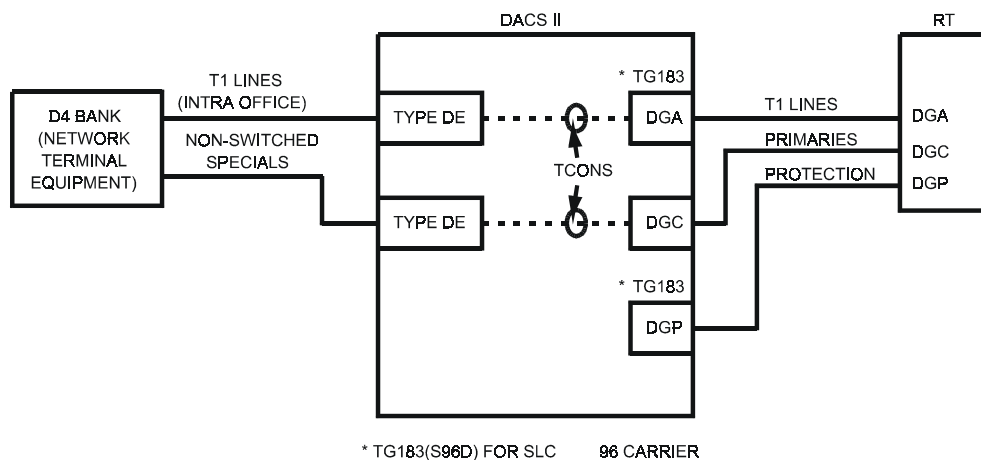


**Figure 3-22. Mode III Configuration**

Testing the power/miscellaneous alarm sent from the RT is an important step. The miscellaneous alarms can indicate an open door, hazards, such as fire, flooding, or gas. Miscellaneous alarms can be used for the second RT bank at the site; the power alarm is used for the first RT bank.

## Establish SLC<sup>®</sup> Carrier Systems (Continued)

### Establish New SLC Series 5 Carrier System Feature Package C (FPC)

This operation is used to equip the NPC slots for the lines going to the RT and the nonswitched voice terminal. If protection switching is provided, the NPCs for the protection line are also equipped. See Figure 3-23.

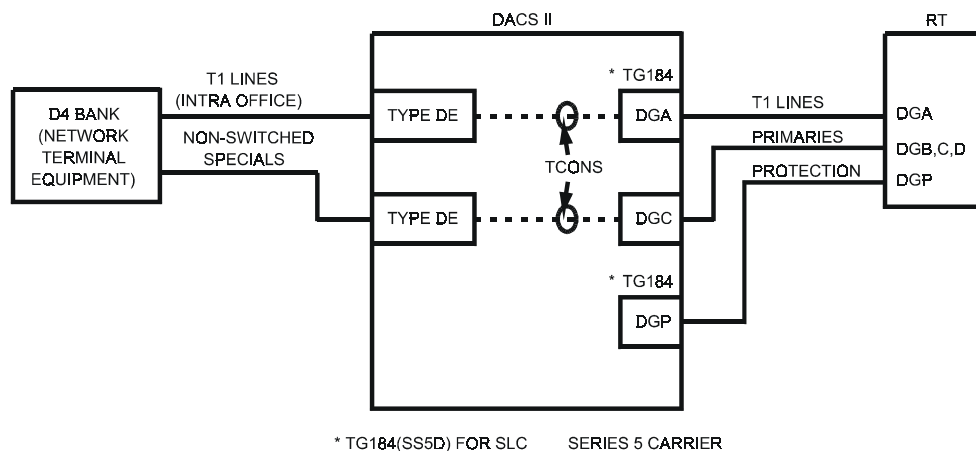


**Figure 3-23. Mode C Configuration**

### Establish Retrofit SLC Series 5 Carrier System Feature Package C (FPC)

This operation is used to equip the NPC slots for the lines going to the RT and to the office terminal. If protection switching is provided, the NPC for the protection line to the RT is also equipped. See Figure 3-23.

## Establish *SLC*<sup>®</sup> Carrier Systems (Continued)

### Make DSX-1 Connections

Use Figure 3-24 to verify that the 48-Volt fuse is at the top of the DSX-bay and TL lamp.

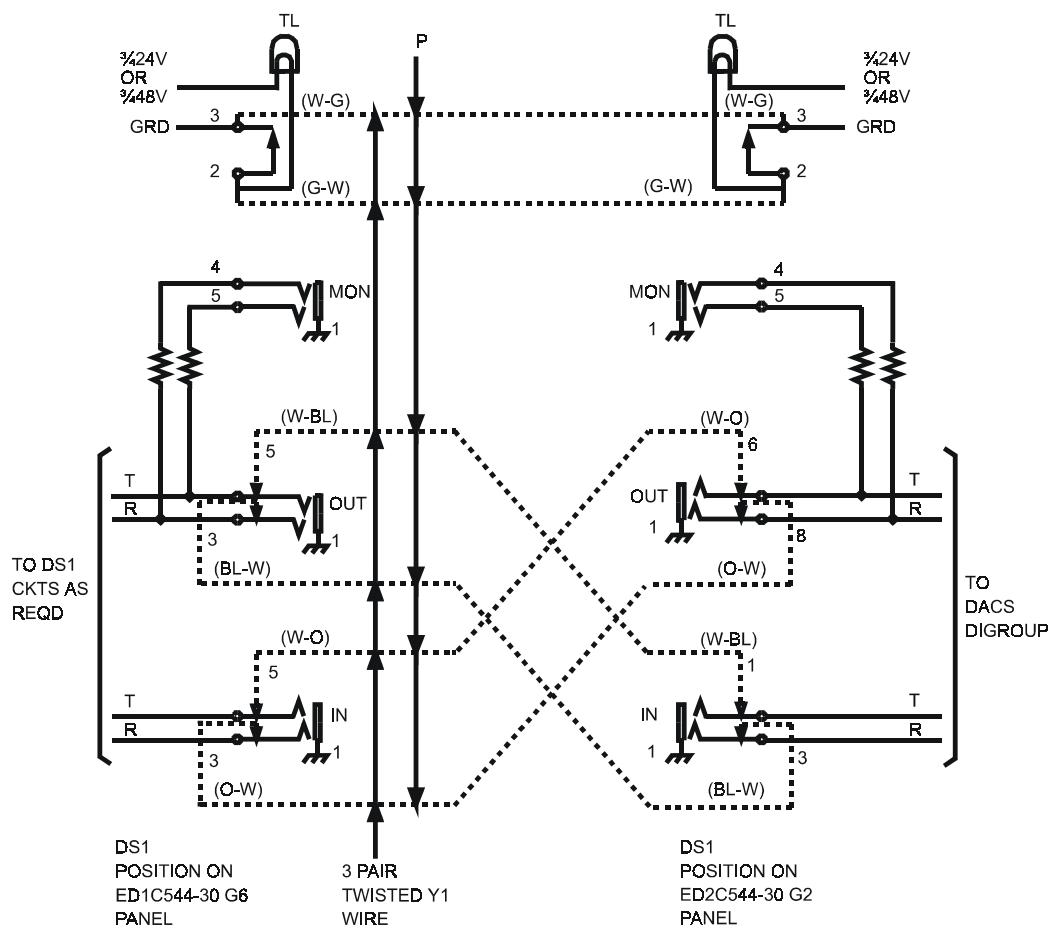


**Figure 3-24. Cross-Connect Schematic**

(Continued on next page)

## Establish SLC<sup>®</sup> Carrier Systems (Continued)

### Make DSX-1 Connections, Continued

Use Figure 3-25 to make the cross-connections between subject jack sets, using Y1-type wire.

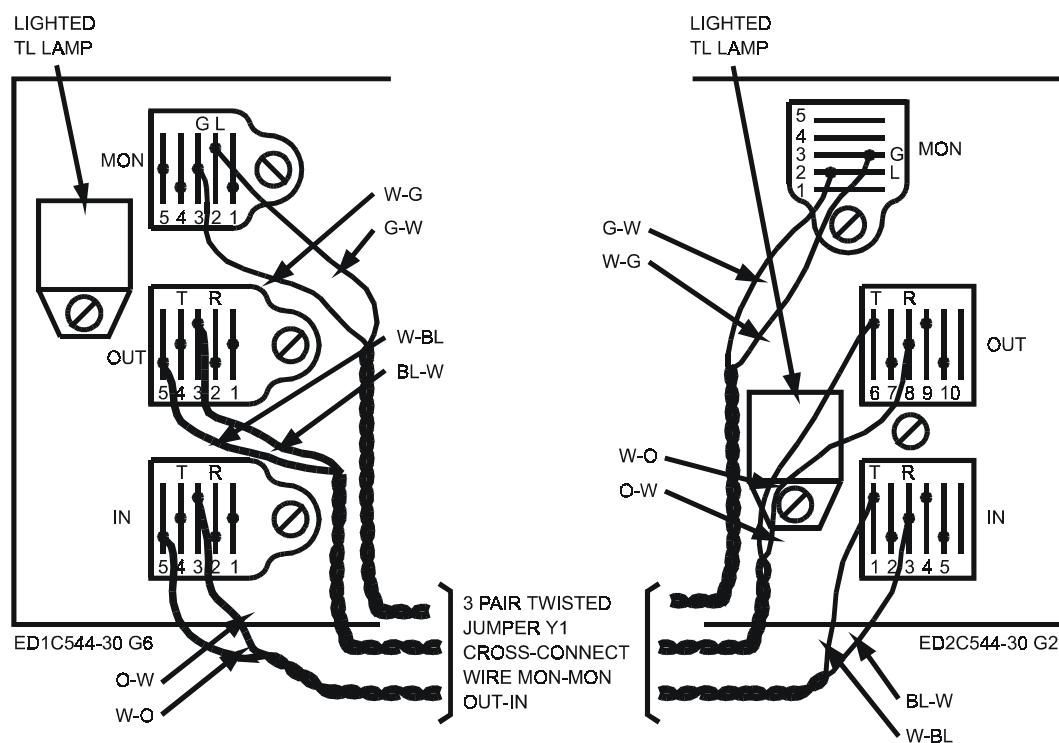


**Figure 3-25. Rear View of 3-Inch Panel**

(Continued on next page)

## Establish SLC<sup>®</sup> Carrier Systems (Continued)

### Make DSX-1 Connections, Continued

Use Figure 3-26 to make the wire-wrap connections between jack sets, using five conductors of the cross-connect wire.

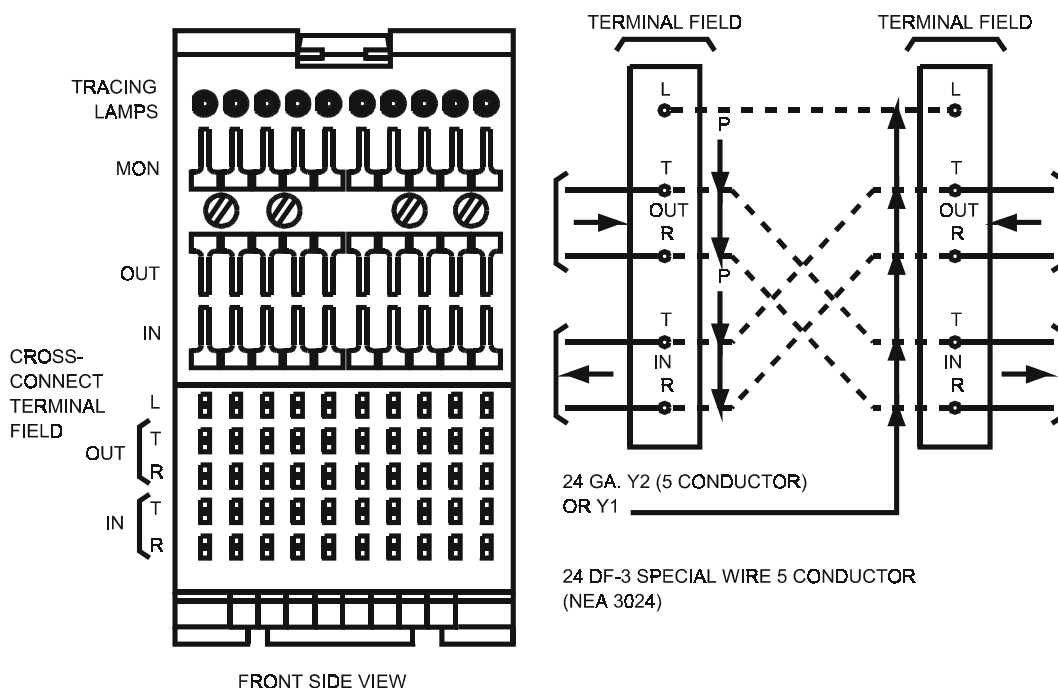


Figure 3-26. 800-Series DSX Details

## **Establish *SLC*<sup>®</sup> Carrier Systems (Continued)**

---

### **Reinitialize the CIU for Use (*SLC* Series 5 Carrier)**

This operation is used to reconnect the CIU if the test set was disconnected during use or was disconnected by DACS II, because the DACS II main controller was reset. Either of these situations causes the CIU to perform self diagnostics, and, if the diagnostics fail, the CIU must be reinitialized before it can be used again. Refer to the CIU User's Guide (Select Code 500-206) for CIU operating instructions.

---

---

## Change *SLC*<sup>®</sup> Carrier System

---

### **Add Protection Switching (Existing System)**

This operation is used to equip the DACS II for a protection line going to the RT to the office switching equipment (for *SLC* 96 carrier Mode I or *SLC* Series 5 carrier). The NPC card for this protection line is always installed in the same DACS II facility unit (IFTU2) as the cards for the primary lines.

Use the DS-type NPC xyz options and alarm parameters described previously to grow the NPCs. The TG183 S96D cards are used for *SLC* 96 carrier and Series 5 FPB. The TG184 SS5D cards are used for *SLC* Series 5 FPC.

For Mode I, the NPCs going to DGA at the RT and DCLU must be on the same dual card. There is no protection line between the DCLU and DACS II.

When the NPCs for DGP of *SLC* 96 carrier Mode I are restored, the DACS II automatically duplicates the cross-connection of the locally-switched channels between the RT and DCLU for DGA.

---

### **Retrofit *SLC* Mode I, 5:5 to 5:4**

This operation is used to convert a *SLC* 96 carrier Mode I, 5:5 protection configuration to a 5:4 protection configuration. There is no protection line from the DACS II and the DCLU; the only protection line will be between the DACS II and the RT. The 5:5 protection provided for earlier generics (protection was provided between the RT, DACS II and the DCLU) is replaced by the *SLC* 96 carrier Mode I, 5:4 pass-through protection. With a 5:4 configuration, the Mode I can have up to 5 DS1 lines (4 service and 1 optional protection) on the RT interface and up to 4 service DS1 lines on the DCLU interface.

To ensure no service outage occurs, it is recommended that all failures on primary (for example, A, B, C, D) be cleared and the digroups restored so that all digroups P of Mode I can be freed from protecting any primary.

The procedure is a 2-step process where all 5:5 protection systems must be manually converted to 4:4 systems prior to the 5:4 retrofit (this must be done before the generic upgrade).

---

---

## Change *SLC*<sup>®</sup> Carrier System (Continued)

---

### Delete Digroup Designations

This operation removes the correlation from the DACS II database in order to make a change. The NPC must be out-of-service to perform this operation.

INCL (inclusive keyword, used to remove an NPC with special circuits) is required to remove DGA because DGA carries the communications data link.

For *SLC* Series 5 carrier, digroup pairs (A and B) and (C and D) must be deleted together in command(s) because they are associated in the RT controller.

---

### Change Far-End Bank Identifier

The far-end bank identifier is used to differentiate between various Remote Terminals (RTs) which may be grown on a DACS II. These identifiers can be changed for the DACS II system as needed.

---

### Change Series 5 Retrofit Designation

The Series 5 retrofit designation assigns the retrofit status for *SLC* Series 5 carrier digroup A to the system. This designation which prevents the DACS II from overwriting (clearing) the RT channel provisioning. The retrofit (RTF) status must be changed after the channel provisioning is loaded into the DACS II to allow DACS II auditing.

---

### Change Power/ Miscellaneous Alarm Designation

The miscellaneous alarms can indicate an open door, hazards, such as fire, flooding, or gas. This alarm can be used for the second RT bank at the site; the power alarm is used for the first RT bank. The designations can be changed to:

- PMN - Power Minor alarm
  - PMJ - Power Major alarm
  - MMN - Miscellaneous Minor
  - MMJ - Miscellaneous Major alarm.
-



## Change *SLC*® Carrier System (Continued)

### Operate *SLC* Carrier System Protection Switch or Line Loopback

Switching to the protection line occurs automatically if one of the primary lines fails and can be initiated by entry of commands at the DACS II. For *SLC* 96 Mode III and *SLC* Series 5 carrier, protection switching is done at the DACS II and the RT.

There is no protection line between DACS II and the DCLU; the protection switching occurs at the DACS II and the RT. The switching is accomplished at the DACS II by automatic cross-connections between the primary and protection line channels. Line loopbacks can be produced on command at the DACS II or connecting RT to allow trouble isolation.

To prevent interruption of service, the loopbacks can only be operated if:

- There are no cross-connections on the digroup
- Protection switching is operated for the digroup
- The digroup is already failed and protection switching is not available.

When retrieving information on the protection line switch (PLSW) or the line loopback (LLB), use Table 3-54 to interpret the keywords.

**Table 3-54. Keyword Meanings**

| Keyword | Meaning                                       |
|---------|-----------------------------------------------|
| SWMR    | Manual protection switch                      |
| SWAR    | Automatic protection switch                   |
| INHB    | Protection switch inhibited                   |
| NORM    | Protection switch is in normal, standby state |
| FRTA    | Loopback action coming from RT/DL active      |
| FRTI    | Loopback action coming from RT/DL inhibited   |
| TRTA    | Loopback action going toward RT/DL active     |
| TRTI    | Loopback action going toward RT/DL inhibited  |
| NORM    | Loopback is in normal, inactive state         |

---

## Establish DS3/HDS3 Facility

---

### Overview

Proper verification of wiring connections and cross-connections is important in preventing facility failures.

---

### Check Far-End Installation, Make DSX-3 Connections, Check DS3/HDS3 Line Status

Before performing these checks and cross-connections, the DS3 MMFGs should already be restored to service as per *Install Circuit Packs, Grow and Restore DS3U/HDS3U*. This operation requires that:

- The far-end DS3 equipment and DS3 lines have been equipped and tested
  - The cross-connections be made from the DSX-3 bay to the DACS II
  - A check of the DS3 line status and verification of the unit and DS3 number(s) in unit
  - The removal of looping cards at the DSX-3 bay and verification of clear DS3 line alarms.
-

## Establish DS3/HDS3 Facility (Continued)

### Test DS3U and HDS3U Protection Switching

Protection switching is used to maintain service in the event of a single fault.

When retrieving information on the maintenance and protection switching, use Table 3-55 to interpret the maintenance and protection keywords.

**Table 3-55. Maintenance and Protection Keywords**

| Keyword                        | Meaning                                                          |
|--------------------------------|------------------------------------------------------------------|
| <b>Maintenance Status</b>      |                                                                  |
| IS                             | In-Service                                                       |
| ISF                            | In-Service, but Failed and Pested                                |
| OOS                            | Out-Of-Service                                                   |
| UEQD                           | Unequipped                                                       |
| <b>Protection Status</b>       |                                                                  |
| 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 Is Allowed   |
| APALW                          | Auto Protection Switch Active and Auto Switchback Is Allowed     |
| MPINH                          | Manual Protection Switch Active and Auto Switchback Is Inhibited |
| APINH                          | Auto Protection Switch Active and Auto Switchback Is Inhibited   |
| (dashes)                       | Service MMFG Not Equipped                                        |
| <b>Protection Availability</b> |                                                                  |
| AVL                            | Available for Switching                                          |
| NVL                            | Not Available for Switching                                      |
| (dashes)                       | MMFG Not Selected for Service                                    |

## **Establish DS3/HDS3 Facility (Continued)**

---

### **Check Far-End Cross-Connection, Loop DS1 Signals, and Check DS1 Status**

This operation requires that:

- The far-end component DS1 facilities and DS3 lines have been equipped and tested
  - The cross-connections be made from the DSX-1 bay to the DACS II
  - A check of the component DS1 status.
-

---

## Subrate (ECCN/CCN to DSPU) Connection

---

### Establish Subrate Channel

This operation connects a channel or a range of channels in a digroup to the subrate feature. Parity channels may also be established. The following types of subrate channel can be established:

- DS0B channel capable of multiplexing 5, 10, or 20 subrate customers
  - DS0B channel capable of multiplexing 5, 10, or 20 subrate customers and parity error correction
  - 56 kb/s channel with parity channel error correction (also referred to as 56 kb/s dataport)
  - DS0A channel with subrate dataport error correction
  - DS0A channel without error correction.
- 

### Change Established Subrate Channel

This operation moves a subrate established channel and all associated subrate cross-connections from an existing digroup and channel to a new digroup and channel.

---

### Disestablish Subrate Channel

This operation disestablishes a channel or a range of channels associated with a group from use by the subrate feature. Associated parity channels are also disestablished. There is an option to insert the UMC control code into the disestablished channel(s) toward the digroup facility.

---

## Links

### Overview

Link connections are needed to establish communication with the DACS II.

---

## Check Link Connections

---

### Data Sets

If data sets are required (such as 202T) for remote connections, then they need to be installed.

---

### Link Adapters

Data link cables (such as M25B) are connected to adapters before being connected to the TTY connector link (behind the DACS II). No adapters are needed for RS-449 cable format, but ED-2C646-30 adapters are required for the RS-232C format:

- 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), or for connecting to a SCAT.
- 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).
- Use a G9 adapter for a link to CIU (craft interface unit) for *SLC*® Series 5 carrier. This is for an asynchronous link.

**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.

---

## **Check Link Connections (Continued)**

### **Unused Links**

Links that are in service but not in use are autonomously removed and restored. To avoid this, links that are not in use should be manually removed from service.

---

## **Initialize, Set Type and Rate Characteristics**

---

### **Overview**

This operation is used to prepare DACS II links for connections. There are seven links available for connection of terminal equipment and operations systems. With the ICI circuit pack, links 1 through 4 are provisionable as asynchronous SNIDER links, links 5 and 6 are synchronous links using X.25 protocol (through level 3) at rates up to 9.6 kb/s, and link 7 is used for a TCP/IP connection.

Before the TCP/IP connection can be used, the IP address for the link must be set up.

Up to 16 virtual circuits can be established on each synchronous link. The characteristics of each link can be changed from their default values.

---



## Initialize, Set Type and Rate Characteristics (Continued)

**Changing/Viewing Link Parameters** The link must be removed from service to change parameters. Table 3-56 lists the default link parameter values.

**Table 3-56. Synchronous Link Level Parameters**

| Parameter Designation      | Meaning                      | Value Range            | Default |
|----------------------------|------------------------------|------------------------|---------|
| <b>Data Layer Values</b>   |                              |                        |         |
| 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      |
| <b>Packet Layer Values</b> |                              |                        |         |
| 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.

(Continued on next page)

## Initialize, Set Type and Rate Characteristics (Continued)

### Changing/Viewing Link Parameters, Continued

Use Figure 3-27 to interpret the link status registers from the link initialization output message.

```
/*Protocol*/
"{S/X}"
/*Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status*/
"bb:e:k:q:x:m,p,hh"
```

|                              |   |                                                                                                                    |
|------------------------------|---|--------------------------------------------------------------------------------------------------------------------|
| <b>Protocol</b>              | = | S for Snider (Async) or X for X.25 (Synchronous)                                                                   |
| <b>bb = &lt;baud&gt;</b>     | = | 03,06,12,24,48,96                                                                                                  |
| <b>e = &lt;backspace&gt;</b> | = | 0 for true backspace, 1 for underscore backspace, or dash (—) for synchronous link.                                |
| <b>k = &lt;alarm&gt;</b>     | = | 1 (link alarm defined as minor) or 2 (defined as major)                                                            |
| <b>q</b>                     | = | ENQ/ACK protocol 0 disabled, 1 enabled (default)                                                                   |
| <b>x</b>                     | = | Xon/Xoff protocol 0 disabled (default), 1 enabled.                                                                 |
| <b>m = &lt;mode&gt;</b>      | = | 0 (idle), 1 (input message), or 2 (output message)                                                                 |
| <b>p = &lt;software&gt;</b>  | = | 0 (protocol exchanges in-service) or 1 (protocol exchanges out-of-service, which slows down DACS II response time) |
| <b>hh = &lt;hardware&gt;</b> | = | 03 (hardware in-service) or 04 (hardware out-of-service)                                                           |

#### ADDITIONAL LINES FOR X.25:

```
/*Data Link Layer parameters: Frame address*/
"K-b,T1-eee,T3-ggg,N2-aa:{A/B}"
/*Packet Layer parameters*/
"W-c,P-ddd,T20-iii,T22-jjj,T23-kkk,T25-lll,T26-mmm,R20-nn,R22-p,R23-q,R25-r"
/*PVC and SVC range: PVC and SVC group number*/
"ppss:gghh"
```

#### TCP/IP FORMAT:

```
<xy> yy-mm-dd hh:mm:ss [LINK-<link number>]
M RTRV PRMTR LINK::j:[ww] COMPLD
/* [S/X] */
/* Protocol */
"I"
/* Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status */
":e:k::,xxxx,hh"
;
```

Figure 3-27. Link Status Register

---

## Change Input Command Priority, Link Language, NPC Addressing, and Output Message Screening

---

### Overview

This operation changes the following settings:

- Input Command Priority
- Link Language
- NPC Addressing
- Output Message Screening.

The actual procedures for changing these settings can be found in Volume II, Chapter 6, *Administration*.

---

### Input Command Priority

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 from different links with the same priority 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.

---

---

## Change Input Command Priority, Link Language, NPC Addressing, and Output Message Screening (Continued)

---

### Link Language

DACS II SNIDER, X.25, and TCP/IP 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 necessary, the message language can be changed during a login session. The message language for your user id can also be changed. For example, if the link defaults to PDS but you work in MML, the link will switch to MML when you log in.

---

### NPC Numbering Scheme

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 ( uv-m-np). 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 addressing scheme for the link is allowable as defined in the configuration file.

---

---

## **Change Input Command Priority, Link Language, NPC Addressing, and Output Message Screening (Continued)**

---

### **Output Message Screening**

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.

---



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## Test Access

# 4

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## Background

### Introduction

Test Access is one of the primary functions of the DACS II frame. It provides a connection to an active or unassigned cross-connection to test a line or isolate a trouble without interfering with any other DS0 circuit. The actual circuit testing is not performed by the DACS II, but by external test equipment. The DACS II provides the interface between the cross-connection and external test equipment.

---

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## Background (Continued)

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### Objectives

This chapter provides information to perform the following:

1. Establish NPC test ports and test groups.
  2. Determine the different types of test access connections.
  3. Perform various test access connections on the following circuit types:
    - DS0 (64-Kbit/s) circuits
    - Clear-DS1 circuits
    - Subrate circuits
    - DSP application circuits
    - Nx64 circuits.
  4. Releasing test access connections.
- 

### Related Information

For related information, refer to the:

- *DACS II Command and Message Manuals*
  - *DACS II/DACS II ISX DSP Application Manuals:*
    - *DMB Application Manual*
    - *X.50/X.57 Subrate Application Manual*
    - *DDS Subrate and MJU Application Manuals.*
-

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## Background (Continued)

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### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

- Make DSX-1 Cross-Connections GT 4.1
- Install Plug-Ins, Grow and Restore NPC to Function as NPCTP or NPCTG GT 4.2
- DS0 Circuits: Connect Hubbed Testport(s) to Local DACS II GT 4.3
- DS0 Circuits: Looping Back a Test Port GT 4.4
- DS0 Circuits: Connect Testport in Monitor Mode and Split Circuit GT 4.5
- DS0 Circuits: Change Circuit Termination State (TLA/TLR) GT 4.6
- DS0 Circuits: Release Test Port GT 4.7
- Clear-DS1 Signals: Establish/Change Clear-DS1 Test Access GT 4.8
- Clear-DS1 Signals: Change Non-channelized Circuit Termination State GT 4.9
- Clear-DS1 Signals: Establish Clear-DS1 Hub Connection GT 4.10
- Clear-DS1 Signals: Establish Loopback on Facility Access Digroup GT 4.11
- Clear-DS1 Signals: Release Test Access GT 4.12
- Subrate DS0A or DS0B Circuits: Access Two-Point Circuit in Monitor Mode GT 4.13
- Subrate DS0A or DS0B Circuits: Access Multipoint Circuit in Monitor Mode GT 4.14
- Subrate DS0A or DS0B Circuits: Access Multipoint Circuit in Split Mode GT 4.15
- Subrate DS0A or DS0B Circuits: Change Access to Split Mode GT 4.16
- Subrate DS0A or DS0B Circuits: Change Terminate and Leave Test Access GT 4.17
- Subrate DS0A or DS0B Circuits: Release Subrate Specific Test Port Channel GT 4.18
- Subrate DS0A or DS0B Circuits: Release Groups of Subrate Testports GT 4.19
- Disestablish a Test Port External to a DSP Application GT 4.20

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(Continued on next page)

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## Background (Continued)

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### Related Tasks, Continued

- |                                                                     |         |
|---------------------------------------------------------------------|---------|
| ■ Nx64 Kbit/s: Connect Test Group in Monitor Mode and Split Circuit | GT 4.21 |
| ■ Nx64 Kbit/s: Change Circuit Termination State                     | GT 4.22 |
| ■ Nx64 Kbit/s: Connect Test Group in HUB Mode                       | GT 4.23 |
| ■ Nx64 Kbit/s: Connect Test Group in LOOPED Mode                    | GT 4.24 |
| ■ Nx64 Kbit/s: Release and Degrow Test Group                        | GT 4.25 |
| ■ Integrated Test Set: Initiate/Stop Test Signal Generation         | GT 4.26 |
| ■ Integrated Test Set: Insert Bit Error                             | GT 4.27 |
| ■ Integrated Test Set: Start/Stop Test Signal Monitoring            | GT 4.28 |
| ■ Integrated Test Set: Query Error Performance Parameters           | GT 4.29 |
-

## Establish NPC Test Ports and Groups

### Overview

The following section provides the reader with reference information which describes:

- Establishing NPC test ports (NPCTPs)
  - Establishing NPC groups (NPCTGs)
  - How they are used in test access connections.
- 

## Establish Test Access Facility

---

### Overview

Establishing the test access facility involves the following:

- Checking wiring and test set cross-connections at the DSX-1 bay
  - Installing, growing, and restoring NPCs as NPCTPs or NPCTGs.
-

## Establish Test Access Facility (Continued)

### Check Connecting Equipment and Make DSX-1 Cross-connections

### Cross-connect Schematic

The wiring between the DACS II and the DSX-1 equipment is important for successful test access. This wiring should be in accordance with the diagram in Figure 4-1.

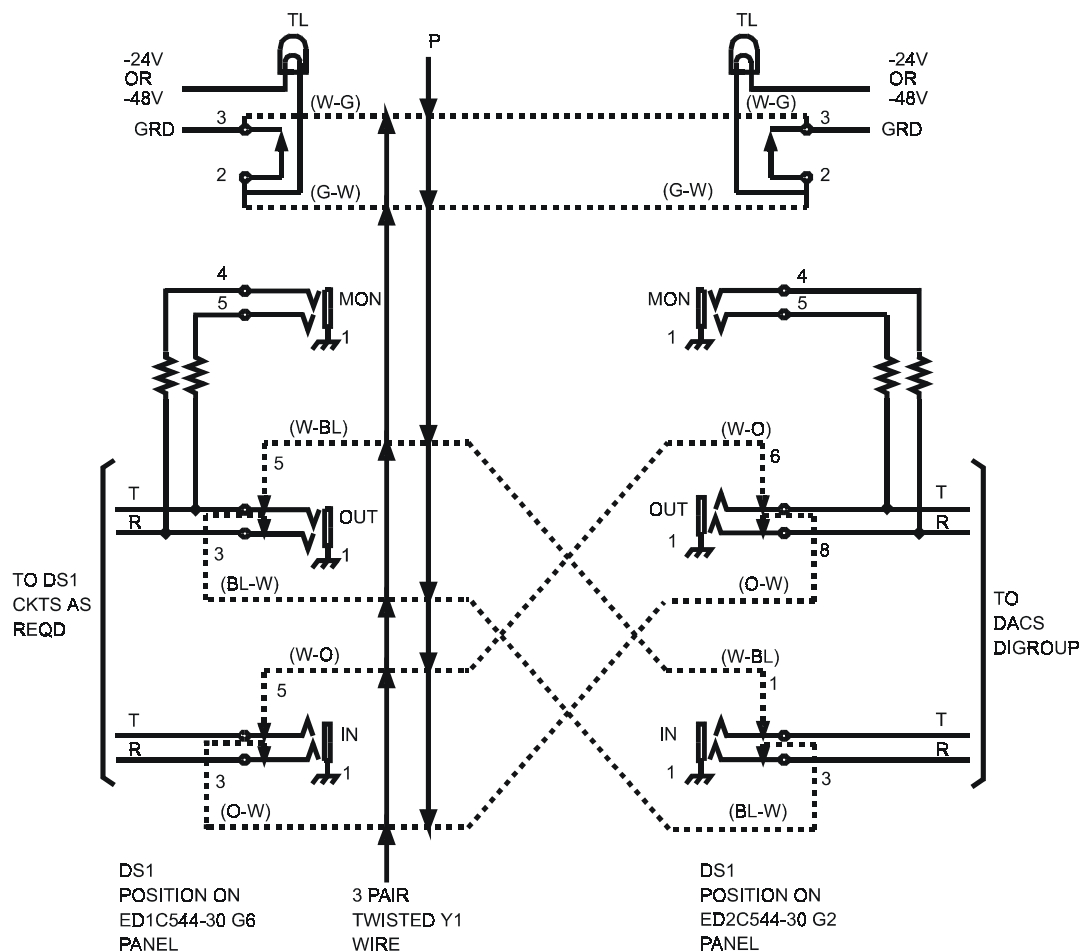


**Figure 4-1. Cross-Connect Schematic**

(Continued on next page)



## Establish Test Access Facility (Continued)

### Check Connecting Equipment and Make DSX-1 Cross-connections, Continued

### Cross-connections Between Subject Jack Sets

Use Figure 4-2 to make the cross-connections between subject jack sets using Y1-type wire.

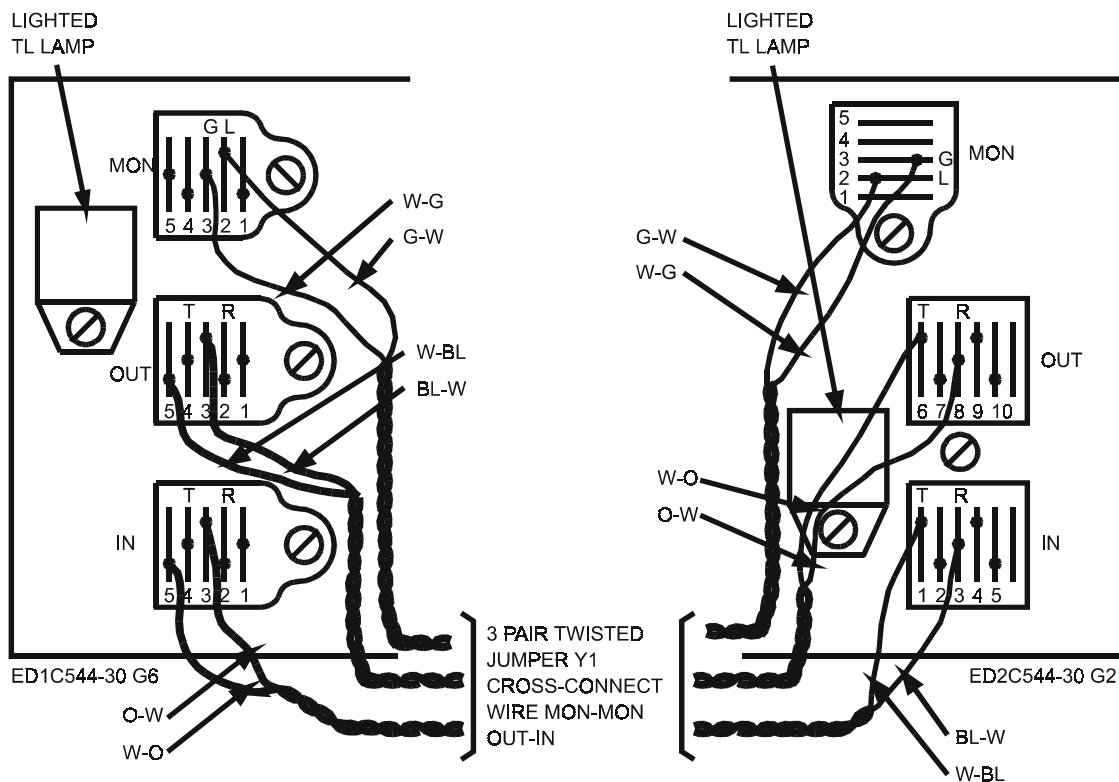


**Figure 4-2. Rear View of 3-Inch Panel**

(Continued on next page)

## Establish Test Access Facility (Continued)

### Check Connecting Equipment and Make DSX-1 Cross-connections, Continued

#### 800-Series DSX Bay

Use Figure 4-3 to make wire-wrap connections between jack sets using five conductors of the cross-connect wire.

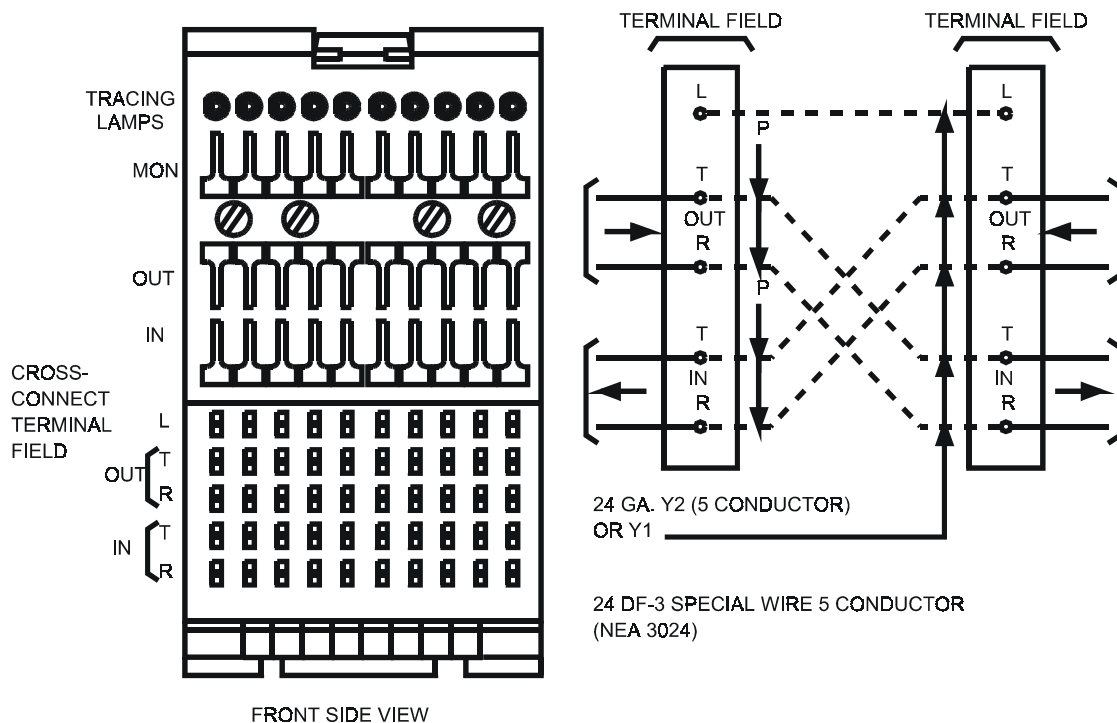


**Figure 4-3. 800-Series DSX Details**

---

## **Establish Test Access Facility (Continued)**

---

### **Install, Grow, and Restore NPCs as NPCTP or NPCTG**

Depending on the type of circuit which is under test, either NPC Test Ports (NPCTPs) or NPC Test Groups (NPCTGs) are connected to the circuit to make the test circuit. NPCTPs and NPCTGs must be defined prior to making any test access connections. The establishment of the NPCs in the NPCTP or NPCTG defines the operating characteristics of the NPCs in the database.

When the NPCs are subsequently restored to service, they will be provisioned per the growth specification. Included in the specification are:

- DS1 line and channel formats
- Facility alarm thresholds
- The channel insertion word.

The DS1 line formats are given by the TYPE specification.

If used, alarm threshold options must already be defined in the data base.

---

---

## **Establish Test Access Facility (Continued)**

---

### **Designate an NPC as NPCTP**

#### **Description**

Test ports are used to perform test access on DS0 circuits. Up to eight NPCTPs can be designated for testing purposes. Each NPCTP has twelve test access ports, for a total 96 test ports available in the DACS II. Each NPCTP is assigned a designator, ranging from 1 to 8. The NPCTP designator determines the test ports to be provisioned on the NPCTP.

#### **NPC-to-NPCTP Process**

The process of provisioning test ports contains three steps:

1. PROVISIONING AN NPC (grow and restore) - provide a location for the DS0 channel test ports.
2. ASSIGNING DESIGNATOR NPCTP - establish an NPC for testing. An NPCTP designator number is assigned to the specified NPC. This number (1-8) is used to associate the NPCTP with its test ports.
3. PROVISION TEST PORTS - establish test ports. Each test port is provisioned individually in ascending order (lowest to highest). Each NPCTP supports a maximum of 12 test ports.

---

(Continued on next page)

## Establish Test Access Facility (Continued)

### Designate an NPC as NPCTP, Continued

#### Test Port Modes

The three test port modes are described in Table 4-1 and illustrated in [Figure 4-4](#).

**Table 4-1. Test Port/Test Group Modes**

| Test Port Modes | Definition                                                                                       |
|-----------------|--------------------------------------------------------------------------------------------------|
| <b>MONITOR</b>  | Checks the customer circuit without interrupting service.                                        |
| <b>SPLIT</b>    | Interrupts the cross-connection to allow the monitoring, sending, and receiving of test signals. |
| <b>RELEASE</b>  | Restores the cross-connection and test port to normal (released)                                 |

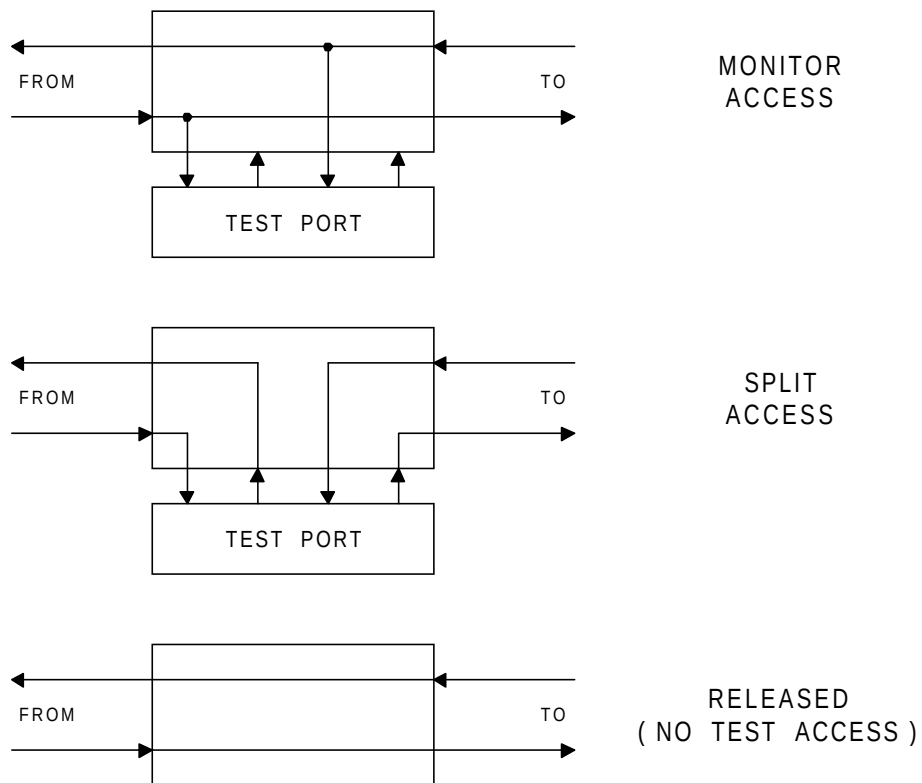


**Figure 4-4. Test Port/Test Group Modes**

---

## Establish Test Access Facility (Continued)

---

### Designate an NPC as NPCTG

#### Description

Test groups are used to perform test access on Nx64 kbps circuits. Each Test Group is assigned an NPCTG designator ranging from 1 to 400.

#### NPCTG-to-NPCTG Process

The process used to establish Nx64 kb/s test groups in the DACS II contains three steps:

1. PROVISIONING NPCs for the NPCTG (grow and restore) - provide a location for the test groups.
2. ASSIGNING DESIGNATOR NPCTG - designate an NPC for testing, an NPCTG designator number (1 through 400) is entered. This number is used to associate each NPCTG to an associated TG.
3. PROVISION TGs - establish Test Groups, TGs (numbered 1 through 400) can be provisioned on or between any of the 400 NPCTGs. Each TG can be any required bandwidth (Nx64). Unlike test ports, TGs can be grown out of numerical sequence.

#### NPCTG Modes

The test group modes are described in Table 4-1 and illustrated in [Figure 4-4](#).

---

---

## Grow Test Ports

---

### Overview

Test ports (TPs) are grown on a TAD (test access digroup). These TADs are given a NPCTP designation in the data base by the entry of a **CRTE NPCTP** command.

Up to eight NPCs can be designated as TADs on the frame. These NPCs provide up to 96 test ports; 12 test ports on each TAD. As each test port is grown, two more channels from the TAD 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.

---

### Trunk Conditioning

When composing the trunk conditioning for an NPCTP, consider the following:

- The trunk conditioning (<tc>) is a combination of a signaling specification followed by an insertion word specification that is sent on the connecting carrier channel during a carrier failure.
- The <tc> specification is used when either:
  - The static <tc> is needed for an analog test system (SARTS/RTS-5A in the USA)
  - When accessing an unmapped circuit.

Otherwise, the <tc> will be dynamic (that is, match what was specified for the cross-connection).

- If trunk conditioning is required for static test ports, see the format of the <tc> field.
-

## **Grow Test Ports (Continued)**

### **Test Port Numbering**

Twelve test ports are available on each designated NPCTP and up to eight NPCTPs can be designated. The test port numbering is listed in Table 4-2 .

**Table 4-2. Test Access Channels**

| <b>Test Access<br/>Port</b> | <b>DS1<br/>Channel</b> |           | <b>CEPT<br/>Channel</b> |           |
|-----------------------------|------------------------|-----------|-------------------------|-----------|
|                             | <b>From</b>            | <b>To</b> | <b>From</b>             | <b>To</b> |
| 01,13,25,37,49,61,73,85     | 1                      | 2         | 5                       | 6         |
| 02,14,26,38,50,62,74,86     | 3                      | 4         | 7                       | 8         |
| 03,15,27,39,51,63,75,87     | 5                      | 6         | 9                       | 10        |
| 04,16,28,40,52,64,76,88     | 7                      | 8         | 11                      | 12        |
| 05,17,29,41,53,65,77,89     | 9                      | 10        | 13                      | 14        |
| 06,18,30,42,54,66,78,90     | 11                     | 12        | 16                      | 17        |
| 07,19,31,43,55,67,79,91     | 13                     | 14        | 18                      | 19        |
| 08,20,32,44,56,68,80,92     | 15                     | 16        | 20                      | 21        |
| 09,21,33,45,57,69,81,93     | 17                     | 18        | 22                      | 23        |
| 10,22,34,46,58,70,82,94     | 19                     | 20        | 24                      | 25        |
| 11,23,35,47,59,71,83,95     | 21                     | 22        | 26                      | 27        |
| 12,24,36,48,60,72,84,96     | 23                     | 24        | 28                      | 29        |



---

## Grow Test Groups

---

### Overview

Test groups (TGs) are grown on a TAD (test access digroup). These TADs are given a NPCTG designation in the database by the entry of a **CRTE NPCTG** command.

Up to 400 test groups can be established on a frame. Each test group consists of two Nx64 Kbit/s bundles for testing both directions, where N is the channel width of the bundles and may be from 1 to 24. The bundles, designated as the east and west bundles, can be on separate NPCs or on the same NPC, if bandwidth permits. During subsequent test access, the channels of the test group are cross-connected to the channels under test.

---

### Trunk Conditioning

When composing the trunk conditioning for an NPCTG, consider the following:

- 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 either:
  - The static <tc> is needed for an analog test system (SARTS/RTS-5A in the USA)
  - When accessing an unmapped circuit.

Otherwise, the <tc> will be dynamic (that is, match what was specified for the cross-connection).

- If trunk conditioning is required for static test ports, see the format of the "tc" field.
- 

### Test Group Ranges

Each test group consists of two equal ranges having a width of up to 24 channels, for DS1. The two ranges may belong to two NPCTGs, or the same NPCTG but not overlapping.

---

## Establish Test Connection

### Overview

The following section is intended to provide the reader with reference information which describes test access connections for the following types circuits: connections:

- DS0 circuits
  - Clear-DS1 circuits
  - Subrate (DS0A and DS0B) circuits
  - Nx64 circuits
  - DSP application (DDS Subrate and MJU, X.50/X.57 Subrate, and DMB) circuits.
- 

## DS0 Test Access

---

### Overview

When initially establishing a DS0 cross-connection in test access, connection will be placed in the Monitor test access mode. This mode monitors signals from both directions of a cross-connection. If desired, the mode can be changed to the Split mode. The circuit termination can be changed for one or both sides of the circuit. When test access is completed, the connection is placed in the Released mode, which releases the circuit from test access.

---

---

## **DS0 Test Access (Continued)**

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### **Establish DS0 Test Access Connection**

When initially establishing a DS0 test access connection, the connection is placed in the Monitor mode before it is split for testing. In a DS1 2.048-Mb/s Interface gateway environment, either a DS1 NPC or a CEPT NPC can be used as the test access NPC. In either case, the test access NPC performs the necessary signal conversions to allow testing either side of the Gateway circuit. To test with a CEPT NPC, the test access NPC must be provisioned for CAS.

---

### **Mapped Test Access**

For mapped test access, the test connection adopts the characteristics of the accessed circuit. The following mapped circuits are supported:

- One-way circuits
  - Two-way circuits.
- 

### **Unmapped Test Access**

For unmapped terminations, the trunk conditioning option and the NAM option (for Gateway) must be specified in the command.

---

---

## DS0 Test Access (Continued)

---

### Using Trunk Conditioning

When composing the trunk conditioning for a DS0 test connection, consider the following:

- Table 4-2 gives the channel numbers associated with the test ports on the TAD .
  - When a mapped circuit is accessed, whatever <tc> is entered when the Monitor mode connection is established will be overwritten by the <tc> of the mapped circuit.
  - When an unmapped circuit is accessed, whatever <tc> is entered when the Monitor mode connection is established will overwrite the <tc> that was specified in the CRTE-EQPT TP command.
  - Access to an unmapped circuit will be denied if the <tc> is not entered when the Monitor mode connection is established or was not entered in the CRTE-EQPT TP command.
- 

### Change Circuit Termination State (TERM/RLS)

Via test access, the termination mode of the cross-connect under test can be changed to:

- Terminate and Leave Active (TERM) - terminate one direction of the test access connection
  - Terminate and Leave Release (RLS) - release the termination of the test access connection.
- 

### Release Test Port

When testing is complete, the test access connections should be released, and the circuit/unmapped channels will resume as normal.

---

## **Clear-DS1 Test Access**

---

### **Overview**

DACS II provides for testing clear unchannelized 1.544 Mb/s or 2.048 Mb/s digital lines. NPCs provisioned as clear unchannelized can be used to provide access for testing. These NPCs, called Facility Access Digroups (FADs), can be located anywhere in the frame. The frame can be equipped with as many FADs as required and are not dedicated. These provisioned NPCs can be used for testing and then later used for cross-connected traffic.

---

## Clear-DS1 Test Access (Continued)

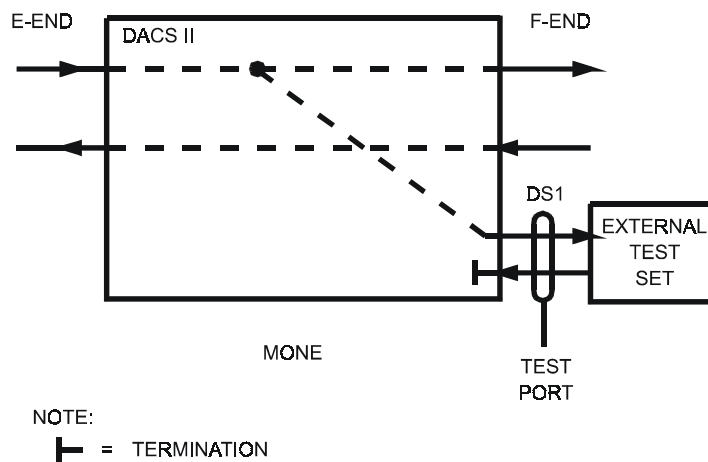
### Clear-DS1 Test Access Modes

The Clear-DS1 test access modes are listed in Table 4-3 and illustrated in Figure 4-5 through Figure 4-18.

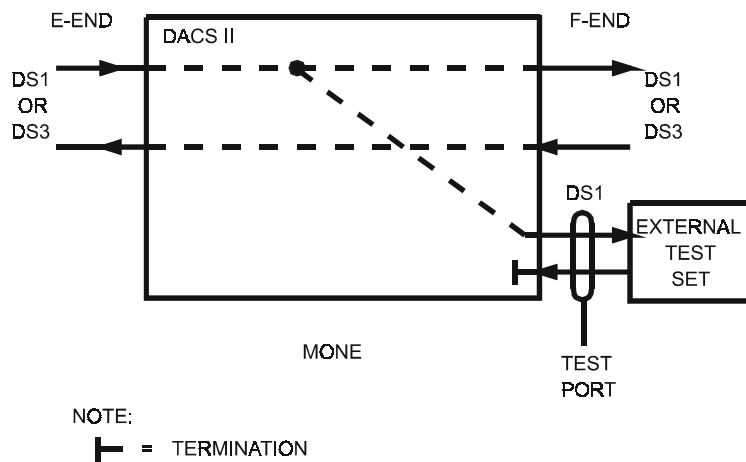
**Table 4-3. Clear-DS1 Test Access Modes**

| Mode   | Meaning                                                                  | Illustration |
|--------|--------------------------------------------------------------------------|--------------|
| MONE   | Monitor Equip (E) End of Idle Port or Cross-Connection                   | Figure 4-5   |
| MONF   | Monitor Fac (F) End of Idle Port or Cross-Connection                     | Figure 4-6   |
| MONEF  | Monitor Both Ends                                                        | Figure 4-7   |
| SPLTA  | Splits E-to-F Connection To Test E-to-F Direction                        | Figure 4-8   |
| SPLTB  | Splits F-to-E Connection To Test F-to-E Direction                        | Figure 4-9   |
| SPLTAB | Splits both A and B signals of a two-way test session                    | Figure 4-10  |
| SPLTE  | Splits E-to-F Connection To Test E End                                   | Figure 4-11  |
| SPLTF  | Splits F-to-E Connection To Test F End                                   | Figure 4-12  |
| SPLTEF | Splits Both Directions To Test E and F Ends                              | Figure 4-13  |
| LOOPE  | Loops E End and Monitors Signal; on 2-Way Circuit, F End Is Disconnected | Figure 4-14  |
| LOOPF  | Loops F End and Monitors Signal; on 2-Way Circuit, E End Is Disconnected | Figure 4-15  |
| HUB    | Non-channelized connection between FAD and remote FAD                    | Figure 4-16  |
| LPBKT  | Terminally loopback non-channelized FAD                                  | Figure 4-17  |
| TNR    | Release one or two FADs and restore circuit to original state            | Figure 4-18  |

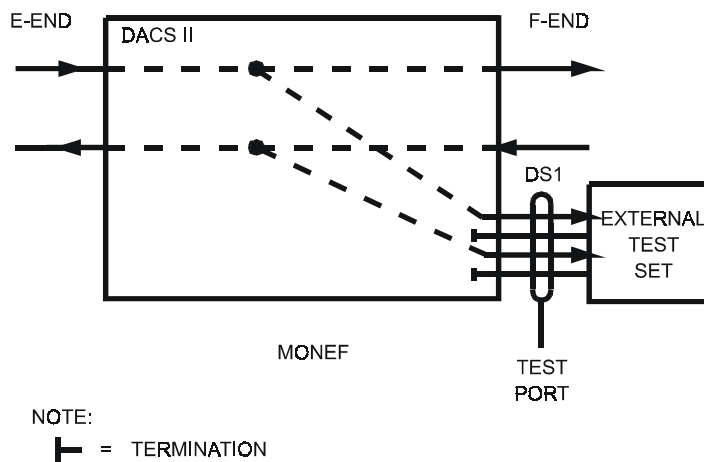
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**Clear-DS1 Test Access (Continued)****Clear-DS1 Test Access Modes, Continued**

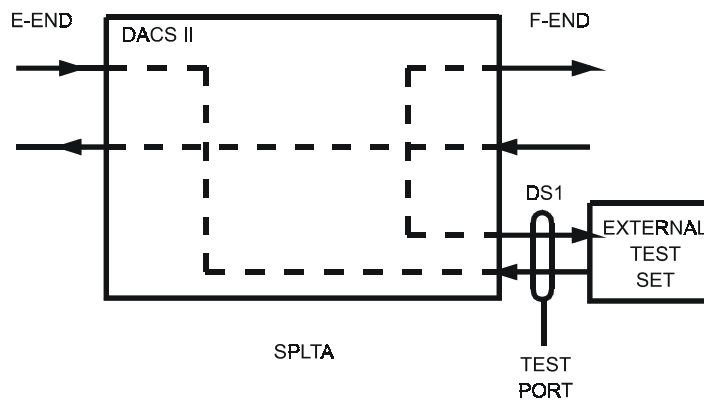
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**Figure 4-5. MONE Mode****Figure 4-6. MONF Mode**

(Continued on next page)

**Clear-DS1 Test Access (Continued)****Clear-DS1 Test Access Modes, Continued**

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**Figure 4-7. MONEF Mode**

tpa 785190/01

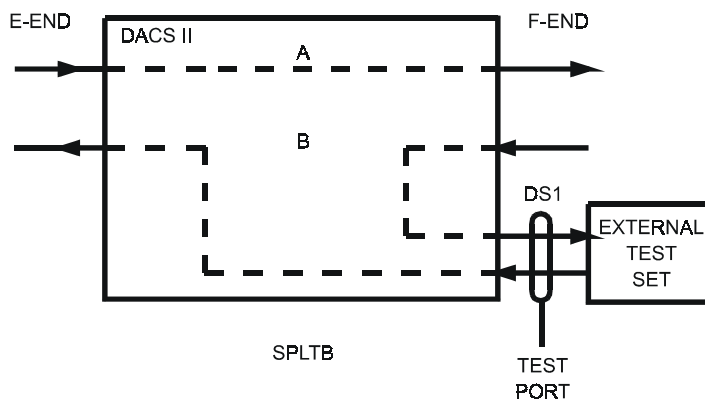
**Figure 4-8. SPLTA Mode**

(Continued on next page)



## Clear-DS1 Test Access (Continued)

### Clear-DS1 Test Access Modes, Continued



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**Figure 4-9. SPLTB Mode**

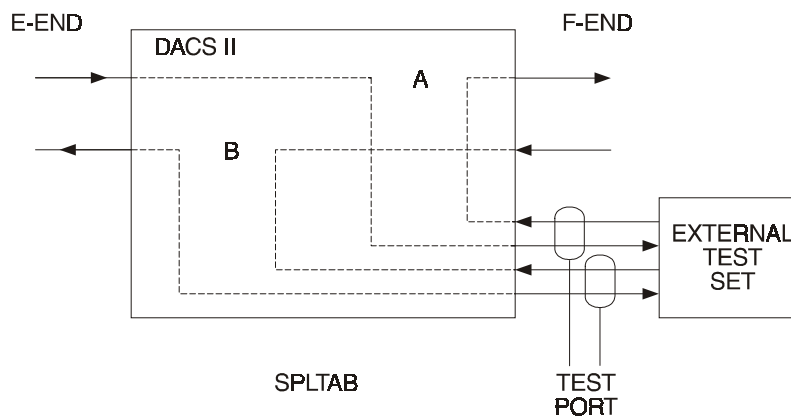
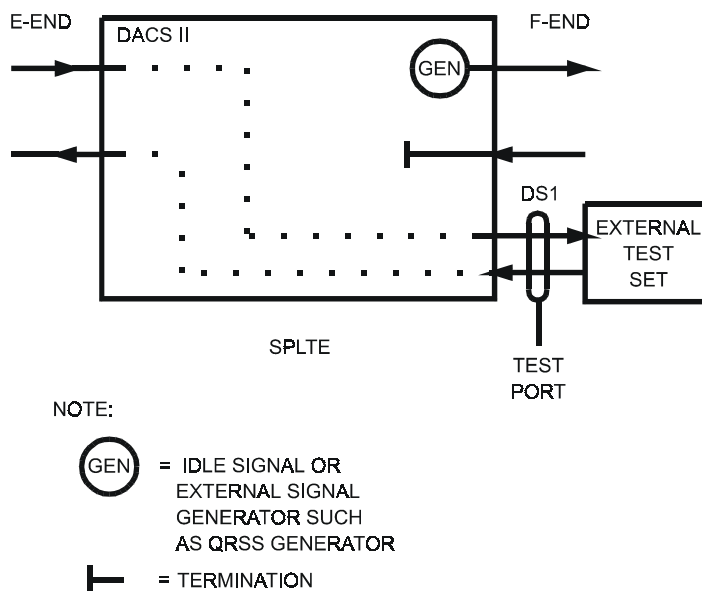
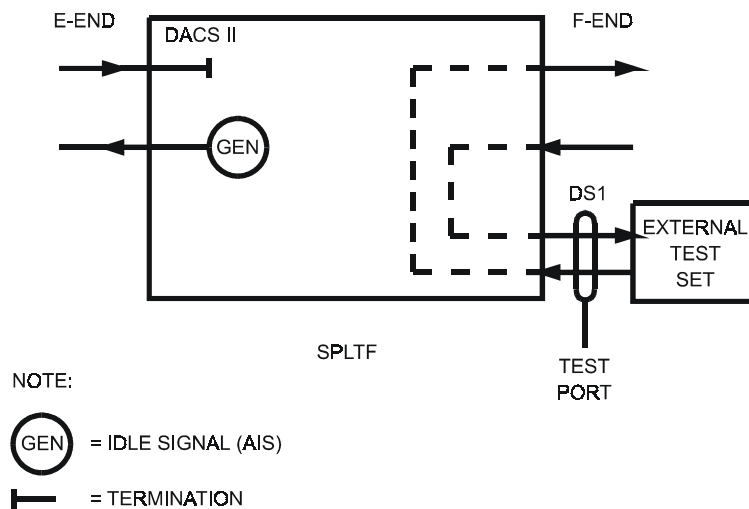


**Figure 4-10. SPLTAB Mode**

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**Clear-DS1 Test Access (Continued)****Clear-DS1 Test Access Modes, Continued**

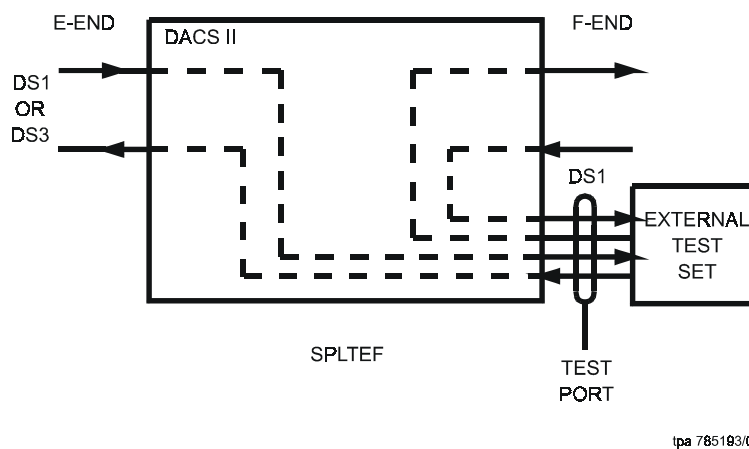
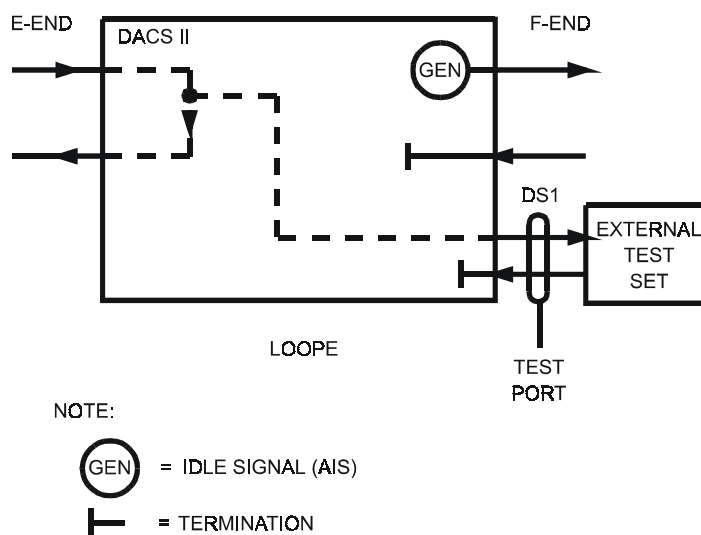
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**Figure 4-11. SPLTE Mode**

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**Figure 4-12. SPLTF Mode**

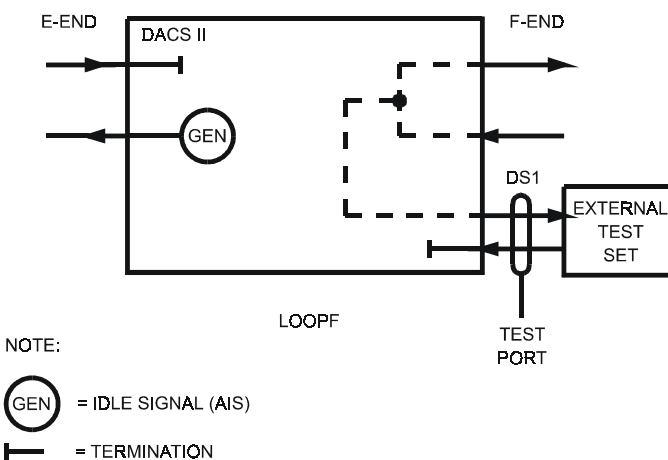
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**Clear-DS1 Test Access (Continued)****Clear-DS1 Test Access Modes, Continued****Figure 4-13. SPLTEF Mode****Figure 4-14. LOOPE Mode**

(Continued on next page)

## Clear-DS1 Test Access (Continued)

### Clear-DS1 Test Access Modes, Continued



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**Figure 4-15. LOOPF Mode**

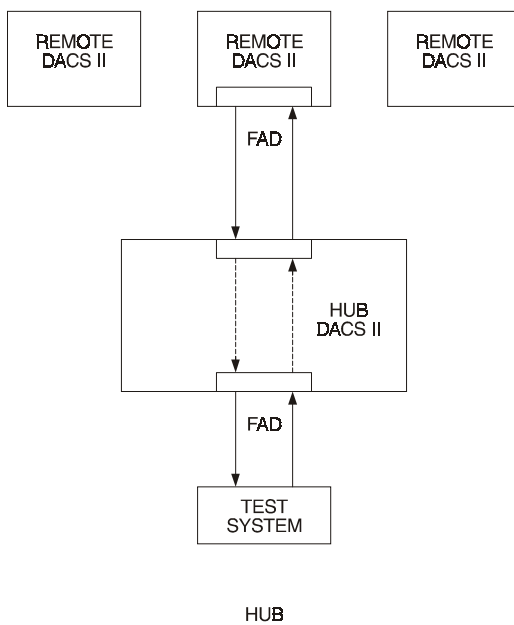


**Figure 4-16. HUB Mode**

(Continued on next page)

## Clear-DS1 Test Access (Continued)

### Clear-DS1 Test Access Modes, Continued

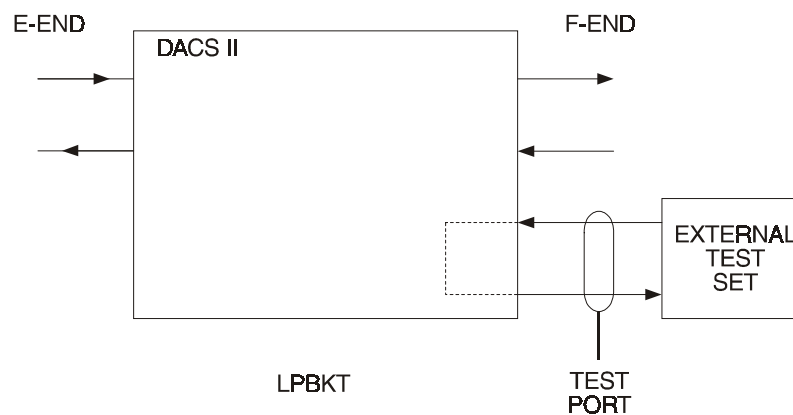


Figure 4-17. LPBKT Mode

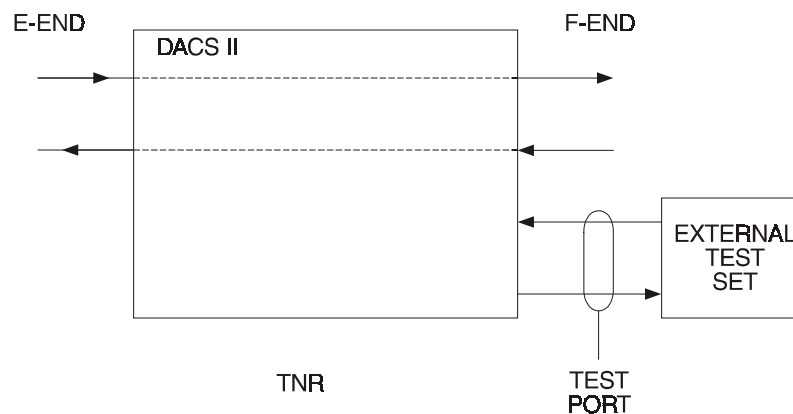


Figure 4-18. TNR Mode

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## Clear-DS1 Test Access (Continued)

---

### Establish Clear-DS1 Test Access

The following clear unchannelized circuits can be tested:

1. Established two-way circuits; can use all modes
2. Established one-way circuits can be tested in the following modes:
  - MONE
  - SPLTA.
3. Unassigned NPCs can be tested in the following modes:
  - MONE
  - SPLTE
  - LOOPE.
4. Broadcast circuits can be tested in the following modes:
  - Master leg and full tributary can be tested in all modes
  - All other tributaries are tested as one-way cross-connections (MONE or SPLTA).



#### NOTE:

Clear unchannelized test access modes MONEF, SPLTEF, and SPLTAB require two FADs. Test access modes which first use only one FAD cannot be changed to a two-FAD access mode. The connection must first be released from testing and then re-established in the new two-FAD test access mode.

---

### Change Clear-DS1 Circuit Termination State

The following restrictions apply when making changes to the clear-DS1 termination state:

- E-end mode cannot be changed for test session in any of the following modes: SPLTF, SPLTEF, or LOOPF.
  - F-end mode cannot be changed for test session in any of the following modes: SPLTE, SPLTEF, or LOOPE.
  - E-end mode cannot be changed on a 1-way circuit under test.
-

---

## Test Access for Subrate DS0A or DS0B Circuits

---

### Overview

A Digital Signal Level Zero A (DS0A) channel carries a single subrate circuit. Since the data rate of subrate circuits is always less than the 64 kbit/s rate of a DS0A channel, additional bits are added to allow a subrate circuit to be carried by a DS0A.

A Digital Signal Level Zero B (DS0B) channel carries several subrate circuits embedded, or multiplexed, in a 64 kbit/s channel. Framing is needed to allow the individual subrate circuits to be demultiplexed from an incoming DS0B channel.

---

### Two-Point Circuit in Monitor Mode

The test port for a DS0A or DS0B subrate circuit can be placed in test access in the Monitor mode. Data transmission in the tested circuit is not interrupted. Although primarily for 2-point circuits, the command used for this test connection can also be used to access the facility ends of a multipoint circuit (on MJU).

---

### Two-Point Circuit in Split Mode

The test port for a DS0A or DS0B subrate circuit can be placed in test access in the Split mode. Data transmission in the tested circuit is interrupted. The specified termination can be part of a two-point circuit or the master leg or branch termination of a multipoint circuit.

Split test access to an entire multiplexed DS0B channel (rather than a single DS0B customer) can also be performed; however, up to 20 subrate customers could be affected.

---

### Multipoint Circuit in Monitor Mode

A subrate multipoint circuit can be placed in test access in the Monitor mode with a test port. Data transmission in the tested circuit is not interrupted.

Test access can be performed on the control leg or a branch.

---

### Multipoint Circuit in Split Mode

A subrate multipoint test access connection can be placed from Monitor mode to the Split mode. Data transmission in the tested circuit is interrupted.

---

## **Test Access for Subrate DS0A or DS0B Circuits (Continued)**

---

### **Release Subrate Test Ports**

When releasing subrate test ports, the user can specify either:

- An individual test port
  - All test ports connected to the subrate circuits that were initiated by the link
  - All test ports connected to subrate channels regardless of which administrative link initiated the test access.
-



---

## DSP Application Test Access Connections

---

### Overview

There are two ways to perform test access on DSP application NPCs:

- Via the generic (described in this section)
- Via application test access commands (the preferred method).

Test access in monitor and split mode may be applied to any cross-connection between a facility terminating NPC and a DSP application NPC. All connections that are internal to a particular application (for example, subrate cross-connections inside a DDS Subrate application or inside an X.50 Subrate application) may only have test access applied to them by the application itself.

---

### Establishing Test Connections

To establish these types of test access connections, refer to the appropriate DSP application manual. The DSP application manuals are:

- *DDS Subrate and MJU Application Manual*
  - *X.50/X.57 Subrate Application Manual*
  - *DMB Application Manual.*
-

---

## DSP Application Test Access Connections (Continued)

---

### Connecting Test Ports to DSP Application Channels/Circuits

A test port established to an application will always appear as a test port in split mode when viewed external to the application using the **RTRV TACC T1** command. This is true even if internal to the application, the test port is in monitor mode.

External to an application, a test port established to an application is simply a cross-connect between two channels on the application that has been placed in split mode by the attached test port. It is important to understand this if it ever becomes necessary to disestablish such a test port external to the application.

**NOTE:**

For additional information on DSP test access, refer to the appropriate section in the application manual.

---

---

## Establish Test Group Connection (Nx64 Kbit/s)

---

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>                                     | A test group connection establishes a test access connection for a range of 64 Kbit/s channels. The range is specified by N, which can be any number between 1 and 24 .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Establish Nx64 Kbit/s Test Access Connection</b> | When initially establishing an Nx64 Kbit/s test access connection, the connection is placed in the Monitor mode before it is split for testing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Mapped Test Access</b>                           | <p>For mapped test access, the test connection adopts the characteristics of the accessed circuit. The following mapped circuits are supported:</p> <ul style="list-style-type: none"><li>■ One-way circuits</li><li>■ Two-way circuits</li><li>■ Broadcast circuits.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Unmapped Test Access</b>                         | For unmapped terminations, the trunk conditioning option must be used in the command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Using Trunk Conditioning</b>                     | <p>When composing the trunk conditioning for an Nx64 Kbit/s test connection, consider the following:</p> <ul style="list-style-type: none"><li>■ When a mapped circuit is accessed, whatever &lt;tc&gt; is entered when the Monitor mode connection is established will be overwritten by the &lt;tc&gt; of the mapped circuit.</li><li>■ When an unmapped circuit is accessed, whatever &lt;tc&gt; is entered when the Monitor mode connection is established will overwrite the &lt;tc&gt; that was specified in the CRTE-EQPT TG command.</li><li>■ Access to an unmapped circuit will be denied if the &lt;tc&gt; is not entered when the Monitor mode connection is established and was not entered in the CRTE-EQPT TG command.</li></ul> |

---

## Establish Test Group Connection (Nx64 Kbit/s) (Continued)

---

### Change Circuit Termination State (TERM/RLS)

The terminate and leave active (TERM) and terminate and leave released (RLS) states are modifiable for 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 TERM states or terminated to modify the RLS states.

---

### Release Test Group

When test access is completed, the user should release one or a range of currently active TGs.

When a TG is released, any circuit under test is restored to its normal, terminated, or unmapped state.

---

## Hub and Loopback Test Access

### Overview

The following section is intended to provide the reader with reference information which describes:

- Hub test access
- Loopback test access.

These test access modes are common to almost all test access connection types.

---

## Hub Test Access

---

### Overview

Hubbing is a specialized test access that allows a connection between a test system and an unmapped location that is connected to another remote DACS II frame. This connection serves as a path to test a cross-connection in the remote DACS II without a direct connection to the test system.

Hub test access is available for the following types of circuits:

- DS0 circuits  
For a DS0 Hub test access, a connection is established between a TAD and an unmapped NPC connected to another remote DACS II.
- Clear-DS1 circuits  
For clear-DS1 Hub test access, a two-way connection is established between a FAD and an unmapped clear-DS1 NPC, which is connected to a FAD on a remote DACS II.
- Nx64 circuits.  
For Nx64 Kbit/s HUB test access, a connection is established via a TG, to an 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, N, is the same as the TG's width, and the starting channels are indicated by the TO termination.

---

(Continued on next page)

## Hub Test Access (Continued)

### Overview, Continued

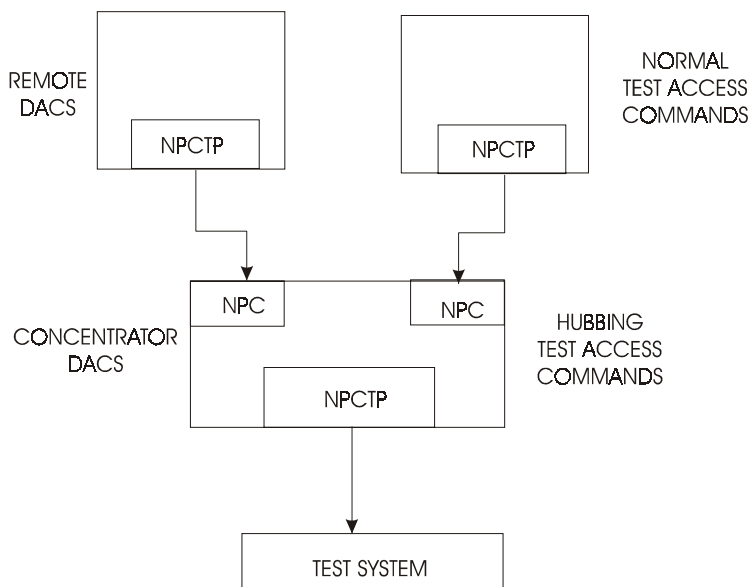


**Figure 4-19. Hubbing Test Access for Test Ports (similar for Test Groups)**

### Test Activity

The Hub test activity includes:

1. Entering a hubbing test access command at the concentrator DACS II to connect the NPC associated with the test system to the dedicated NPC that is associated with the remote DACS.
2. Entering the appropriate test access commands at the remote DACS to perform the desired test.
3. Entering a release hubbing test access command in the concentrator DACS II when all test access is concluded and released at the remote DACS.

### Using Trunk Conditioning

The trunk conditioning (<tc>) should not be specified for a 2.048 Mb/s TP or TG unless the NPC termination specified in the command belongs to a 1.544 Mb/s circuit. If both terminations are 2.048 Mb/s type framing, then the <tc> will default to 16-state signaling with all ones and an insertion word of all ones.

## Loopback Test Access

### Overview

Loopback is a specialized test access that allows each of the two sides of a test system to be individually looped back to itself. The signal received from the facility side is returned to the facility, as shown in Figure 4-20. Loopback is useful for testing the connection between the test system and the external test equipment.

Loopback test access is available for the following types of circuits:

- DS0 circuits

For DS0 loopback test access, the two channels of a specified TP are individually looped back to itself.

- Clear-DS1 circuits

For clear-DS1 loopback test access, 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.

- Nx64 circuits

For Nx64 Kbit/s loopback test access, both bundles of a TG are individually looped back to itself.

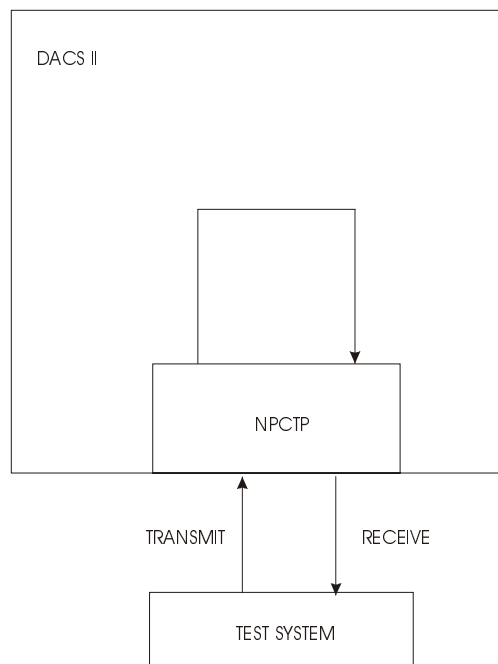


**Figure 4-20. Loopback Test Access for Test Ports (similar for Test Groups)**

---

## Loopback Test Access (Continued)

---

### Test Activity

Because loopback is a verification of the test access, it does not connect to any circuits. The loopback test activity includes:

1. Entering a command to place the test system into the loopback mode.
  2. The test system inserts a signal (level, frequency, or bit pattern) into the transmit direction.
  3. The test system takes measurements at the receive side to assure that the signal (level, frequency, or bit pattern) is correct.
  4. If a difference is noticed, adjustments are made to the interface equipment to compensate for the error.
- 

### Using Trunk Conditioning

The need to specify a <tc> value depends on the type of Test Port/Test Group (TP/TG) that is being looped back:

- Trunk conditioning must be specified only when looping back a dynamic TP/TG. A dynamic TP/TG is defined as a TP/TG in which trunk conditioning was not specified when the TP/TG was provisioned.
  - Although it is not required, trunk conditioning may be specified to loop a static TP/TG. A static TP/TG is defined as a TP/TG in which trunk conditioning was specified when the TP/TG was provisioned. If trunk conditioning is specified for the loopback connection, it will be used. If it is not specified, the TP/TG's trunk conditioning value will be used.
-



---

## Integrated Test Set

**Overview** The Integrated Test Set (ITS) feature provides the DACS II with a built-in Bit Error Ratio Tester (BERT) capability. ITS was developed for facility troubleshooting, providing the capability of generating, reading, and evaluating test signals from the DACS II without the use of external test sets. ITS test access is available for Nx64 kbit/s circuits ( $1 \leq N \leq 24$  for North American NPCs and  $1 \leq N \leq 31$  for international NPCs).

---

### ITS NPC Information

---

**Overview** This section describes the ITS circuit pack and NPC types.

---

**ITS Circuit Pack** The ITS is implemented on the Digital Signal Processing (DSP) circuit pack, TG193B. The DACS II TG193B pack generates and measures the test signals and provides a test access point.

---

**Circuit Types Supported** ITS can be used with test access for fractional DS1 and E1 (Nx64 kbit/s) circuit testing for the monitor, split, hub, and looped test access modes.

 **NOTE:**  
The only type of connections allowed on a ST-type NPC are test access connections. All other cross-connections (for example, CONN-CRS-T1, CONN-CRS1-T0, etc.) are not permitted.

---

## ITS NPC Information (Continued)

### Installing/ Growing ITS NPCs

To support ITS, the NPCs must be grown as ST-type NPCs. The two STxyz types available are:

- ST100 - 32 channel FTM (International)
- ST110 - 24 channel FTM (North American).

Where the x value indicates the feature (x=1 indicates the ITS feature) and the y value indicates which FTM type the NPCs can be grown in (y=0 indicates the 32 channel FTM and y=1 indicates the 24 channel FTM).

Two NPCs can be grown on a TG193B card, providing a total of 64 channels (24 channels per NPC for the North American FTM and 32 channels per NPC for the International FTM).

The NPC type and possible card slot designations are illustrated in Table 4-4.

**Table 4-4. STxyz Type Card Slot Designations**

| NPC Type | FTM Type                    | Possible FTM Card Slot Numbers |
|----------|-----------------------------|--------------------------------|
| ST100    | 32 channel (International)  | 1 through 16                   |
| ST110    | 24 channel (North American) | 1 through 20                   |

### Test Groups

ST-type NPCs must be provisioned as test groups. Test ports are not allowed for ST-type NPCs.

## ITS Test Access

### Overview

This section illustrates the test access modes available with ITS NPCs.

### Test Access Modes

The following test access modes are supported for ITS NPCs:

- Monitor
- Split
- Hub
- Looped
- Release.

Figure 4-21 through Figure 4-25 illustrate each test access mode for Nx64 kbit/s circuits.

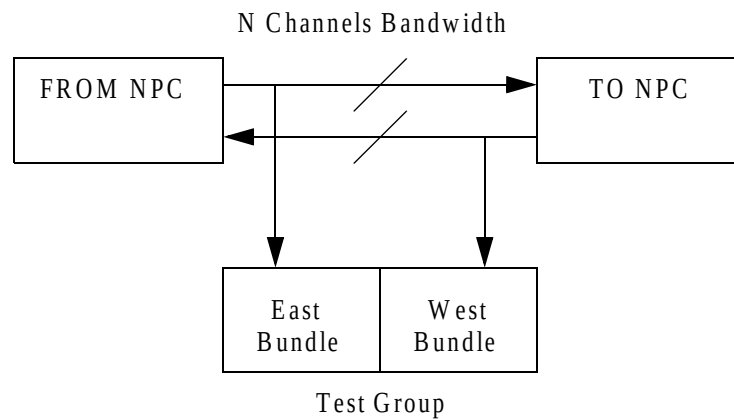


**Figure 4-21. Test Access in Monitor Mode**

(Continued on next page)

## ITS Test Access (Continued)

### Test Access Modes (Continued)

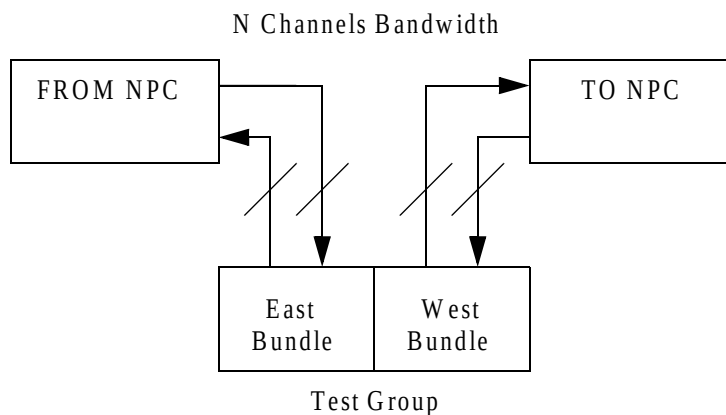


**Figure 4-22. Test Access in Split Mode**

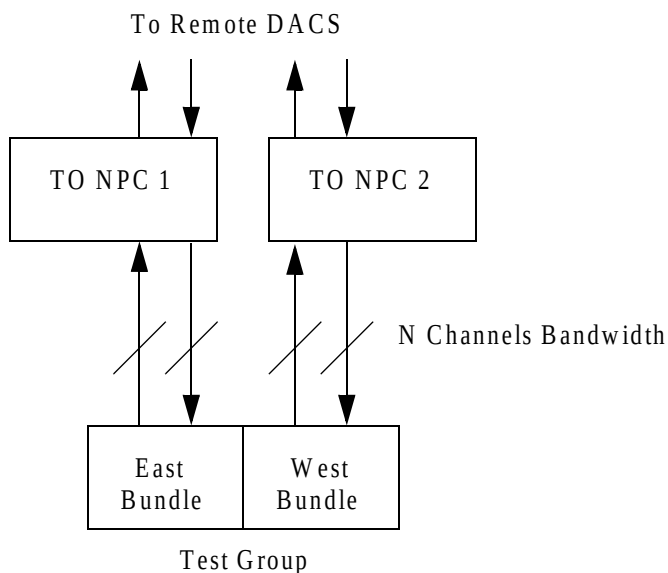


**Figure 4-23. Test Access in Hub Mode**

**NOTE:**  
NPCs 1 and 2 could be the same NPC if the bandwidth is small enough.

(Continued on next page)

## ITS Test Access (Continued)

### Test Access Modes (Continued)

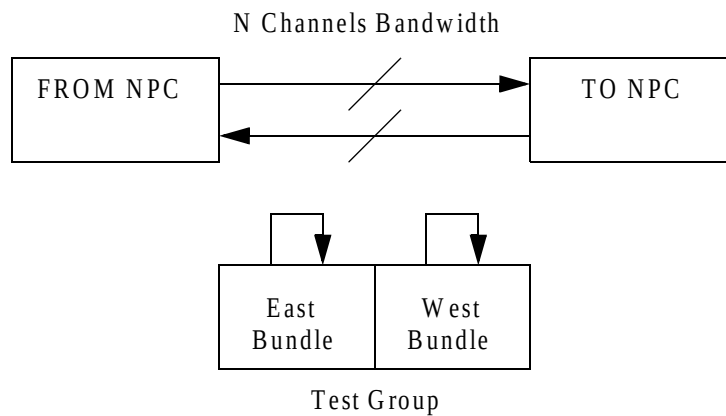


**Figure 4-24. Test Access in Looped Mode**

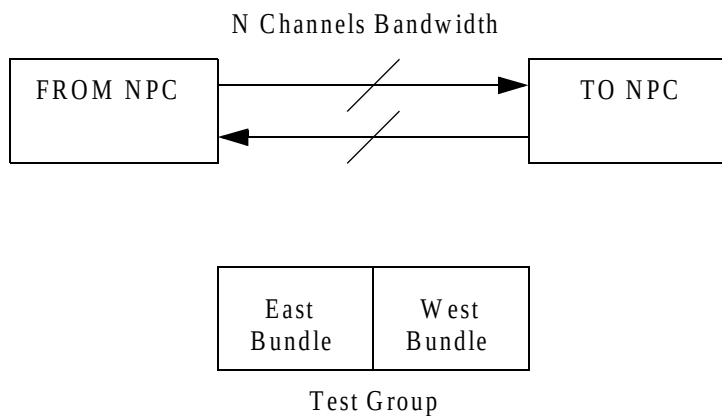


**Figure 4-25. Test Access in Release Mode**

---

## Test Signal Generation

---

### Overview

Test signal generation will only be allowed in the split, hub, and looped test access modes. While test signal generation is in progress, the test group will not be able to exit the split, hub, or looped test access modes.

Each test group is comprised of the following two bundles:

- The East bundle
- The West bundle.

Each bundle consists N channels for an Nx64 kbit/s test access connection. The bundle of the test group (East or West) must be specified to indicate which side to transmit the signal to. An all ones signal (11111111) will be transmitted to the unspecified bundle.

---

### Test Patterns

The ITS NPCs can generate the following types of test pattern for the Nx64 kbit/s test access:

- 511 PRBS (Pseudo-Random Binary Sequence)
- 2047 PRBS
- An 8-bit user-defined code (where the user selects the test pattern).

The 511 PRBS and 2047 PRBS conform to ITU Recommendation G.821.

---

### Bit Errors

The ITS NPCs are able to insert a single bit error into the generated test signal for measuring purposes. The single bit error is created by inverting the first bit in the transmitted pattern in the next frame.

---

---

## Test Signal Monitoring

---

### Overview

Like test signal generation, test signal monitoring will only be allowed in the split, hub, and looped test access modes. Additionally, the Test Group must be in Generation mode prior to entering Test Signal Monitoring mode. While test signal monitoring is in progress, the test group will not be able to exit the split, hub, or looped test access modes.

The ITS is able to recognize and synchronize to all test signal types that it is capable of generating. Additionally, the ITS should be able to recognize any received bits errors in the incoming channel.

---

### Test Pattern Synchronization

The test pattern is considered in synchronization if there are 32 error-free clock cycles (frames with no errors).

---

### Test Pattern Loss

The test pattern's synchronization is considered lost when the bit error ratio exceeds the following threshold for a period of 100 milliseconds:

- 20% for PRBS signals
  - 4% for user-specified 8-bit patterns.
- 

### Test Pattern Resynchronization

Once the test pattern is declared lost, a resynchronization is automatically attempted.

---

## Test Signal Monitoring (Continued)

---

### Error Performance Parameters

Error performance parameters are calculated by the ITS during test signal monitoring based on ITU Recommendation G.821. The following statistics are kept:

- Elapsed Time ( $S_{TOTAL}$ ) - total time elapsed since entering the test signal monitoring mode.
- Out of Synchronization Seconds ( $S_{OOS}$ ) - the number of seconds during which pattern synchronization was not maintained over the entire second.
- Unavailable Seconds ( $S_{UNAVAIL}$ ) - a count of unavailable seconds.
- Available Seconds ( $S_{AVAIL}$ ) - a count of available seconds.  

$$S_{AVAIL} = S_{TOTAL} - (S_{UNAVAIL} + S_{OOS})$$

A period of unavailable time begins when the bit error rate (BER) is  $\geq 1 \times 10^{-3}$  for a period of ten consecutive seconds. These ten seconds are all unavailable time. A separate criteria exists for the transition from unavailable time to available time. A new period of available time begins at the onset of a period of ten consecutive seconds each of which has a BER  $< 1 \times 10^{-3}$ . These ten seconds are all available time.

- Bit Errors (BE) - count of logical bit errors detected.
- Bit Error Ratio (BER) -  $(\text{Total Bit Errors}) / (S_{AVAIL} - \text{Data Rate})$ .
- Errored Seconds (ES) - number of seconds in which one or more bits are in error.
- Severely Errored Seconds (SES) - number of seconds with BER  $\geq 1 \times 10^{-3}$ .
- Errored Seconds Ratio (ESR) -  $ES / (S_{AVAIL})$ .
- Severely Errored Second Ratio (ESR) -  $SES / (S_{AVAIL})$ .

### Test Monitoring Duration

The test can be set to last a period from 1 to 120 minutes, although the user is allowed to stop the test at any point. Additionally, the test interval does not have to be specified. If no time period is specified by the user, the test duration is open ended, and the test will stop only upon request from the user.

When the test is completed, a full set of error performance parameters will be displayed.

---



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# Cross-Connections and Disconnections

# 5

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| ■ Network Element                             | <a href="#"><u>5-49</u></a> |
| Overview                                      | <a href="#"><u>5-49</u></a> |
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---

## Cross-Connections and Disconnections

# 5

---

### Background

#### Introduction

The primary functions of the DACS II is to provide electronic cross-connections. DACS II can cross-connect DS0 to DS0, NxDS0 to NxDS0, and 24 to 24 DS0 channels. There are two major types of cross-connections in the DACS II, two-point and multipoint with several variations of each.

#### Cross-Connection Keywords

Table 5-1 displays the first few keywords used in the cross-connection/disconnection commands. These keywords will help indicate the type of cross-connection.

**Table 5-1. Cross-Connection Keywords.**

| Keyword | Description      |
|---------|------------------|
| CRS     | 2-way connection |
| CRS1    | 1-way connection |
| T0      | DS0 circuit      |
| T1      | DS1 circuit      |
| T3      | DS3 circuit      |

## **Background (Continued)**

---

### **Objectives**

This chapter provides information to perform the following:

1. Establish Cross-Connections
  2. Change Terminations state of Cross-Connections
  3. Disconnect Cross-Connections.
- 

### **Related Information**

For related information, refer to the *DACS II Command and Message Manual*.

---



## Background (Continued)

---

### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

|                                                                             |         |
|-----------------------------------------------------------------------------|---------|
| ■ DS0 Signals: Two-point, Two-way or One-way Circuits                       | GT 5.1  |
| ■ DS0 Signals: Two-point Gateway Circuits                                   | GT 5.2  |
| ■ DS0 Signals: Two-point Multi-point Circuits                               | GT 5.3  |
| ■ DS0 Signals: Broadcast Circuits                                           | GT 5.4  |
| ■ DS0 Signals: One-Way Multipoint Circuit                                   | GT 5.5  |
| ■ DS0 Signals: Change Termination (TLA/TLR) or Conference Bridge Parameters | GT 5.6  |
| ■ DS0 Signals: Disconnect Cross-Connected Circuit                           | GT 5.7  |
| ■ DS0 Signals: Move Facility End Points                                     | GT 5.8  |
| ■ Clear-DS1 Signals: Cross-Connect Two-Point, Two-Way or One-Way Circuit    | GT 5.9  |
| ■ Clear-DS1 Signals: Cross-Connect Broadcast Circuit                        | GT 5.10 |
| ■ Clear-DS1 Signals: Disconnect Cross-Connected Circuit                     | GT 5.11 |
| ■ TS0: Cross-Connect Two-Way Circuit                                        | GT 5.12 |
| ■ TS0: Broadcast Circuit                                                    | GT 5.13 |
| ■ TS0: Change TS0                                                           | GT 5.14 |
| ■ TS0: Disconnect TS0 Circuit                                               | GT 5.15 |
| ■ TS0: Disconnect Broadcast Circuit                                         | GT 5.16 |
| ■ Subrate: Cross-Connect Two-Point, Circuit                                 | GT 5.17 |
| ■ Subrate: Connect Multipoint Circuit (with DSPU)                           | GT 5.18 |
| ■ Subrate: Connect 19.2-kb/s Multipoint Circuit (with External MJU Shelf)   | GT 5.19 |
| ■ Subrate: Change Two-Point Terminate and Leave State                       | GT 5.20 |
| ■ Subrate: Change Multipoint Terminate and Leave State                      | GT 5.21 |
| ■ Subrate: Change Multipoint Master                                         | GT 5.22 |
| ■ Subrate: Disconnect Two-Point Circuit                                     | GT 5.23 |
| ■ Subrate: Disconnect Multipoint Bridge                                     | GT 5.24 |
| ■ Subrate: Disconnect Multipoint Master                                     | GT 5.25 |

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(Continued on next page)

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## Background (Continued)

---

### Related Tasks, Continued

- |                                                                                       |         |
|---------------------------------------------------------------------------------------|---------|
| ■ Re-Direct DS0 Signals                                                               | GT 5.26 |
| ■ Re-Direct DS1 Signals: Network Element                                              | GT 5.27 |
| ■ Re-Direct DS1 Signals: Non-Network Element                                          | GT 5.28 |
| ■ DSP Application: Cross-Connect, Change or Disconnect<br>DSP Application Connections | GT 5.29 |
| ■ DSP Platform: Application-to-Application Cross-Connections                          | GT 5.30 |
-

---

## **Cross-Connect, Change or Disconnect DS0 Signals (Including *SLC*® Carrier)**

### **Overview**

This section provides information on the following:

- Cross-connect, Change, or Disconnect DS0 (Including *SLC*® Carrier)
  - Change Termination or Conference Bridge Parameters
  - Disconnect Cross-Connected Circuits
  - Move Facility End Points.
- 

## **Two-Point, Two-Way Circuit or One-Way Circuit**

---

### **Overview**

This section provides information for 1-way or 2-way cross-connections between channels of NPCs.

- Two-point Gateway Circuits
  - Two-way Multipoint Circuits
  - Broadcast Circuits
  - One-Way Multipoint Circuits.
-

## Two-Point, Two-Way Circuit or One-Way Circuit (Continued)

### Trunk Conditioning

Trunk conditioning (TC) is used for alternate signaling bits to be sent during a failure (when required). The trunk conditioning field specifies how the DACS II should respond to either incoming digital signal failures or removal of NPCs from service (manually or autonomously). Bits are also sent in the voice channel to provide a quiet level or standard signal. Trunk conditioning is always required with a channelized cross-connection.

### Trunk Conditioning Formats

Use Table 5-2 to construct a value for trunk conditioning. If performing a one-way cross-connection, enter four dashes for the FROM side in the TC field.

**Table 5-2. Trunk Conditioning Formats**

| <b>16-STATE SIGNALING;</b>                 |                                                                                                                                  | <b>NO SIGNALING/<br/>TRANSPARENT;</b> |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Hexadecimal: TC-X-rs,X-tu),IW-X-nn         |                                                                                                                                  | TRSP[,IW-X-nn]                        |
| Binary: TC-efghijkl,mnopqrst,{IW-X-nn/TRB} |                                                                                                                                  | TRSP,{MUX/TRB}                        |
| X-rs                                       | = Hex word for 8-bit pattern to be sent on FROM side<br>rs = binary abcdabcd                                                     |                                       |
| X-tu                                       | = Hex word for 8-bit pattern to be sent on TO side<br>tu = binary abcdabcd                                                       |                                       |
| <b>4-STATE SIGNALING (BITS ab)</b>         |                                                                                                                                  |                                       |
| Binary: TC-ijkl,mnop,{IW-X-nn/TRB}         |                                                                                                                                  |                                       |
| ijkl                                       | = Binary word for 4-bit pattern to be sent on FROM side<br>The ij is for the first 2.5 seconds;<br>kl is for the remaining time. |                                       |
| mnop                                       | = Binary word for 4-bit pattern to be sent on TO side<br>mn is for the first 2.5 seconds;<br>op is for the remaining time.       |                                       |

## Two-Point, Two-Way Circuit or One-Way Circuit (Continued)

**SLC Carrier NPCs** If cross-connecting SLC Carrier NPCs, use Table 5-3 to enter the appropriate channel numbers for the NPC used.

**Table 5-3. Channel Numbers**

| Type NPC                | Channels                             |
|-------------------------|--------------------------------------|
| DE                      | 01-24                                |
| SLC® 96 carrier Mode I  | 01-24                                |
| & SLC Series 5 carrier  | 25-48 (DGA Virtual Channels for DGB) |
|                         | 49-72 (DGA Virtual Channels for DGC) |
|                         | 73-96 (DGA Virtual Channels for DGD) |
| SLC 96 carrier Mode III | Odd Channels 01-47                   |
|                         | Odd Channels 49-95 (DGA Virtual      |
|                         | Channels for DGC)                    |
| DMB                     | 01-85                                |

**NOTE 1:**

Channel Numbering - The channel numbers for four digroups at the RT are numbered 01 through 96; the channels at the DACS II are numbered the same and are all considered to be on digroup A NPC. In SLC 96 carrier Mode III where only two digroups and odd channels are involved at the RT, the same odd-numbered channels are used at both ends and the channels are considered to be all on digroup A.

**NOTE 2:**

Mode I - Only channels from the associated RT (same ID) can be cross-connected to a given DCLU. Furthermore, the same channel numbers must be used in both the FROM and TO sides of the command to connect the RT to the DCLU. Channels left vacant by removal of nonswitched specials are not used (no channel packing).

Mode III - Only odd channels corresponding to RT single channels are used.

**NOTE 3:**

The FDL (facility data link) of the ESF (extended superframe) signal can be cross-connected as channel 00.

---

## Two-Point Gateway Circuit

---

### Overview

This section provides information for 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.

---

### Channel Ranges

When entering a channel range in the cross-connection command, 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.
-

## Two-Point Gateway Circuit (Continued)

---

### Trunk Conditioning

Consider the following information on trunk conditioning:

- 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.

Part A of Figure 5-1 illustrates the data flow of the trunk conditioning.

---

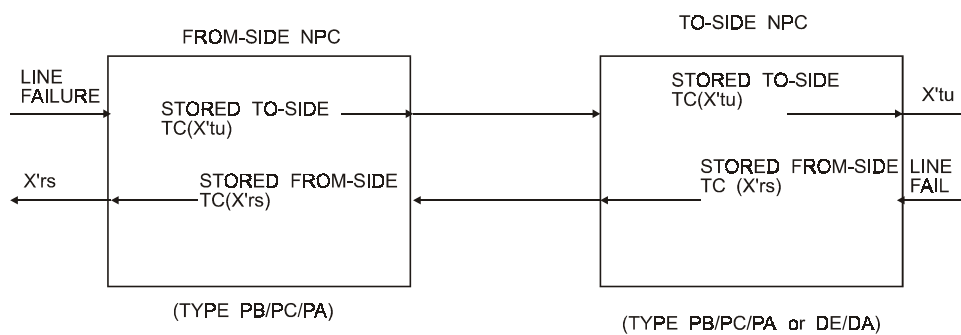
### Signaling Conversion

Consider the following information on trunk conditioning:

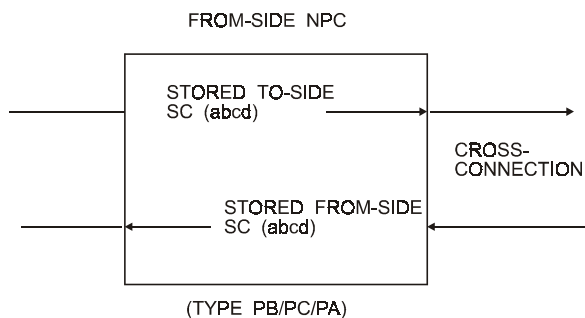
- The FROM and TO sides of the SC field correspond to the FROM and TO terminations entered in the command.
- The defaults for the <sc> field are: PP01 (Type DE1 NPC), PPPP (Type DE2 or DE3 NPC), and 1101 (with TRSP <tc>).

Part B of Figure 5-1 illustrates the data flow of the signaling conversion.

---



A. TRUNK CONDITIONING



B. SIGNALING CONVERSION

**Figure 5-1. Trunk Conditioning and Signaling Conversion Diagrams**



---

## Two-Way Multipoint Circuit

---

### Overview

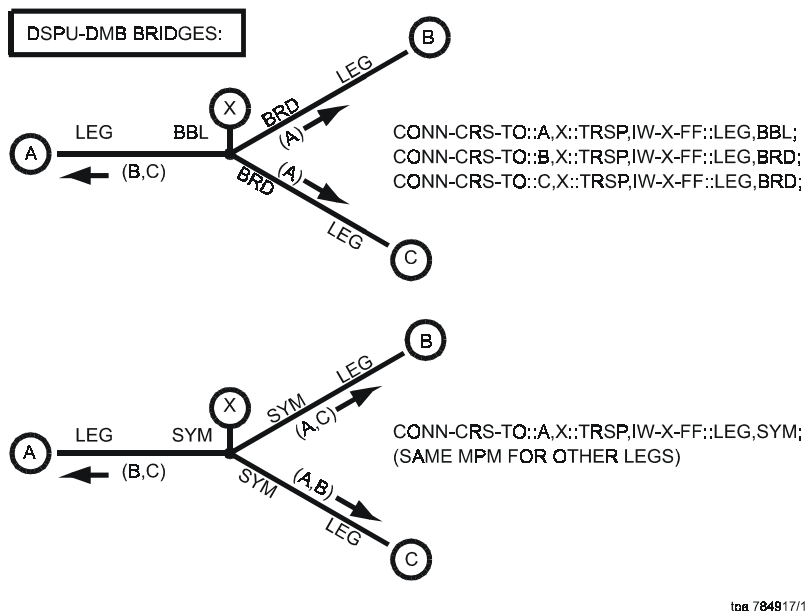
This section covers both symmetrical and broadcast multipoint configurations that are set up using the DSPU (DMB-type) NPC or virtual NPC. The virtual NPCs are 961 and 962 (99-1-01 and 99-1-02) for non-CEF frames, and [9]961 through [9]966 (99-1-01 through 99-1-06) for CEF frames. [9]961 through [9]966 (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. The DACS II conferencing provides  $\mu$ -law companding for DS1 signals; for gateway, the type-PB/PC NPC makes the needed signal conversions.

---

## Two-Way Multipoint Circuit (Continued)

### DMB Circuits

Figure 5-2 displays models of multipoint circuits produced by DMB NPCs.



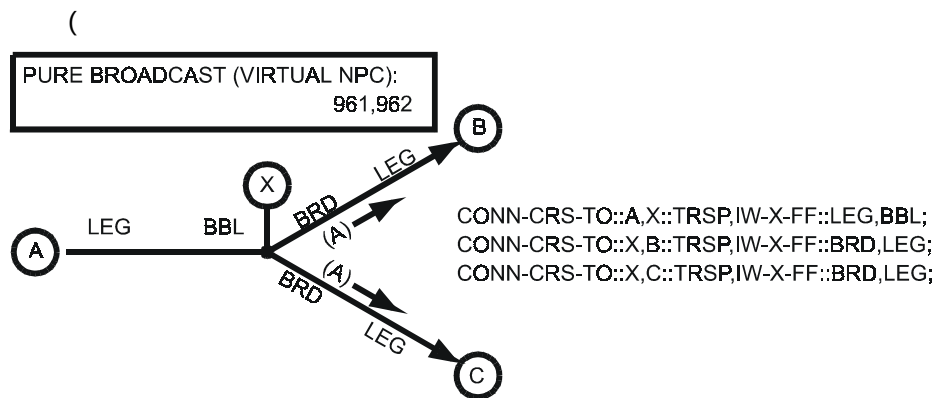
lpa 784917/11

**Figure 5-2. DMB Circuit Configurations**

## Two-Way Multipoint Circuit (Continued)

### Virtual Circuits

Figure 5-3 displays models of multipoint circuits produced by specifying virtual NPCs.



spw 78491811

**Figure 5-3. Virtual NPC Broadcast**

## Two-Way Multipoint Circuit (Continued)

### Multipoint Channel Numbers

Table 5-4 lists the multipoint NPC type and its appropriate channel numbers.

**Table 5-4. 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. (ddd/jjj) | 01 - 24 (01 - 96 for SLC Carrier) | 01 - 85            | 001 - 500                    |
| Mode (fmd,tmd)        | LEG                               | SYM,BBL,BRD        | BBL,BRD                      |

### Trunk Conditioning

Use Figure 5-4 to construct a value for trunk conditioning.

<tc> = TRSP[,IW-X-nn]  
 <tc> = TRSP{MUX/TRB}  
 <tc> = TRSP,IW-X-nn[n]  
 (Default = TRSP,IW-X-FF)

**Figure 5-4. Construction of TRSP Trunk Conditioning**

---

## Broadcast Circuit

---

### Overview

This section presents the BDCST 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 with ampersands (&). 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 RPATH command.

**NOTE:**

The Broadcast TS0 information can be found in the *Broadcast TS0 Connections* section in this chapter.

---

## One-Way Multipoint Circuit

### Overview

This section explains a method to establish one-way broadcast circuits using the CRS1 MPM command and virtual NPC [9]961 through [9]966 (or 99-1-01 through 99-1-06). 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.

### Virtual NPC Broadcast

Figure 5-5 displays a model of a pure broadcast network produced by specifying the first virtual NPC (9961). The commands shown are only examples.

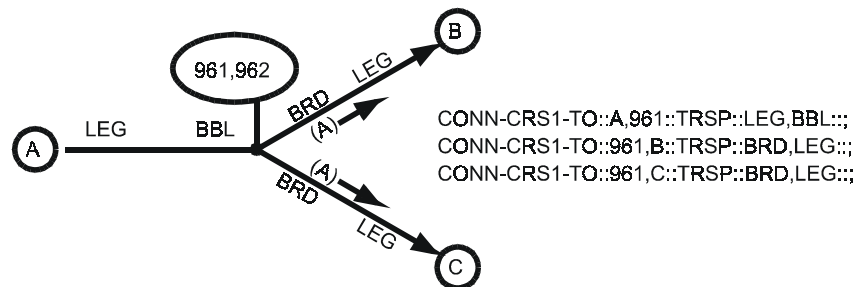


**Figure 5-5. Virtual NPC Broadcast**

### Trunk Conditioning

Use Figure 5-6 to construct a value for trunk conditioning.

```

<tc> = TRSP[,IW-X-nn]
<tc> = TRSP{MUX/TRB}

```

**Figure 5-6. Construction of TRSP Trunk Conditioning**

---

## Change Termination (TLA/TLR) or Conference Bridge Parameters

---

### Overview

The following cross-connect settings can be changed:

- Termination State; terminated or released state on the circuit from:
  - TO side
  - FROM side
  - BOTH sides
  - All legs toward bridge
  - All legs toward facilities
  - All legs in both directions.
- Conference Bridge Parameters
  - Signal level (input and output levels, ranging from -9.0 to +8.8 dB in steps of 0.2 dB)
  - Noise guard (00, 06, 12, or 18 dB)
  - Echo suppression (00, 06, 12, or 18 dB).

---

### Termination State

The termination state or TLP (transmission level point) of a conference bridge circuit cannot be changed if the TO or FROM side of the cross-connection was previously designated as NTR (no transmit).

---

### Conference Bridge Parameters

To make conference bridge parameter changes, the DMB bridge side of the conference must be specified as <npc No.2> in the command.

---

---

## Disconnect Cross-Connected Circuit

---

### Overview

DACS II provides commands to disconnect two-way, two-point cross-connect circuits or a range of cross-connected circuits when required. The BDIS command disconnects up to eight non-channelized tributaries from a non-channelized source network processing circuit (NPC). The NPCs can be in different units. This message also disconnects tributaries and can convert a broadcast conference to a two-way, two-point circuit. When the circuit is disconnected, the idle code (AIS) is transmitted.

---

### Broadcast Disconnection

If disconnecting a broadcast cross-connection, consider the following:

- 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 ampersand. The optional listing goes in the field after the "<npc No.2>-jjj" in the command.
  - When using individual DISC 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.
-



---

## Move Facility End Points

---

### Overview

The alternate cross-connect command moves the facility end points of existing cross-connection(s) from the original facility NPCs to either:

- Other facility NPCs
- Facility legs of DMBs.

When moving facility end points to facility legs of DMBs, the old and new DMBs must be the same type.

This function is accomplished by overwrite operations in the ECCN and does not cause any more than a hit on the moved circuit (10 ms maximum per moved circuit). One application of this command is for equipment cutover where connections must be moved from existing facility terminations to new facility terminations. Disconnecting the old endpoints is included in the command function; so no disconnect command must be entered.

**NOTE:**

Performing this procedure incorrectly can interrupt service. Familiarize yourself with the procedure (GT 6.8 in Volume II, Chapter 6) and commands before beginning and perform each step of the procedure in the order given.

---

## **Move Facility End Points (Continued)**

### **Examples**

Figure 5-7 and Figure 5-8 display two examples of facility endpoint moves and the command, showing the connections after the command is executed.

|       |         |       |
|-------|---------|-------|
| NPC C | <-----> | NPC A |
| (FAC) |         | (FAC) |
| NPC D | <-----> | NPC B |
| (FAC) |         | (FAC) |

**ED-CRS-T0::<npc D>-ddd,<npc A>-jjj;**

---

**Figure 5-7. Facility-to-Facility Move**

---

(Continued on next page)



---

## **Move Facility End Points (Continued)**

---

### **Command Restrictions**

The following command restrictions apply:

- All the involved NPCs must have in-service (and not failed or pested) status.
  - The new NPC channel can be currently mapped to a 2-way, 2-point circuit or unmapped.
  - None of the involved NPCs can be: type PB or PC, *SLC* carrier type DS, interface unit types IU or TI, or clear-DS1 types (xyz = 9-9).
  - The TC (trunk conditioning) of the circuit to be moved must be appropriate for the new circuit. A cross-connection with robbed-bit signaling for the D4 bank line format is not appropriate for NPCs grown with the T1DM line format.
-

## **Cross-Connect or Disconnect Clear-DS1**

**Overview** This section provides the information required to cross-connect or disconnect Clear DS1s.

---

## **Two-Point, Two-Way or One-Way Circuit**

---

**Overview** Commands are provided to connect full bandwidth DS1s (with no framing or channels). For full bandwidth connections, the NPCs on both sides must be grown as Clear-DS1 types.

---

---

## Broadcast Circuit

---

### Overview

Up to eight tributaries can be connected to the broadcast leg at one time by listing them in the BDCST command with ampersands (&s). 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 RPATH command.

- When using individual DISC 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.
-

## Cross-Connect, Change, Disconnect TS0

|                 |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b> | <p>This section provides information required to perform the following:</p> <ul style="list-style-type: none"><li>■ Cross-Connect Two-Way Circuits</li><li>■ Broadcast Circuits</li><li>■ Change spare TS0 Bits</li><li>■ Change Monitoring State of TS0</li><li>■ Change NPC Non-Frame Word Setting</li><li>■ Disconnect Two-way TS0 Circuits</li><li>■ Disconnect Broadcast Circuits.</li></ul> |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

### Cross-Connect Two-way Circuit

---

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>       | <p>DACS II provides a command to establish a TS0 (channel 00) to non-TS0 cross-connection. A cross-connect mode must be chosen to prevent the TS0 Frame Alignment Signal (FAS) from being transmitted to a non-TS0 time slot.</p>                                                                                                                                                                                                                                                                                                                                        |
| <b>False Framing</b>  | <p>The DS1 facility has 24 time slots numbered 0-23, and the E1 facility has 32 time slots numbered from 0-31. Time Slot 0 (TS0) is used to transmit a Frame Alignment Signal (FAS), bit pattern 00110011, designating the start of a new frame. False framing can occur while cross-connecting TS0 to another time slot. To avoid false framing, the DACS II transforms the FAS by either replacing it with a pseudo FAS or with the previous Non-Frame Word (NFW). This change will keep the DACS II from detecting the start of a new frame in another time slot.</p> |
| <b>NPC Types Used</b> | <p>The NPC containing the TS0 channel must be a PA- or TH-type NPC, while the NPC containing the non-TS0 channel can be either a PA-, PB-, PC-, or TH-type NPC.</p>                                                                                                                                                                                                                                                                                                                                                                                                      |

---

## Broadcast Circuit

---

**Overview** This feature allows the ability to establish a broadcast cross-connection between Time Slot 0 (TS0) and non-TS0 facilities. The FROM NPC containing the TS0 must be grown as a PA- or TH-type NPC. The TOX NPCs containing the non-TS0 tributaries must be grown as PA-, PB-, PC-, or TH-type NPCs.

---

**Circuit Restrictions** Unlike normal broadcasts, there will be:

- No looped return or normal signal tributary return available
- No A-law to  $\mu$ -law conversion
- No capability to specify the connection as a red circuit (RDC/RDLD) or a customer-controlled circuit (CUS)
- No ability to specify trunk conditioning (default is TRSP)
- No ability to specify insertion word (default is X'FF).

---

**Broadcast Tributaries** This command establishes a broadcast for a TS0 channel of a source (FROM) NPC to up to 8 non-TS0 tributary channels of the TO NPC. A conference may have any number of tributaries, depending on the frame configuration. Additional tributaries can be added to the broadcast by using subsequent commands.

---

**Channel Numbers** The channel numbers used in the broadcast connection are as follows:

- 000-030 for CEPT type NPCs grown as CAS
- 000-031 for CEPT type NPCs grown as NSA.

---



---

## Change TS0

---

### Overview

DACS II allows the changing of the spare national and international bits in TS0 (TS0-abcdefgh) in timeslot 0. Each variable (a through h) may be set to a specific value for a desired performance.

---

### TS0 Spare Bit Meanings

The following list indicates the possible values each bit (abcdefgh) can have:

- 0 or 1 = Set TS0 bit to this value
  - P = Received bit is passed through (cross-connected unchanged)
  - "-" = Neither the variable nor TS0 bit is changed.
-

---

## Change TS0 Monitor

---

### Overview

A user can change the NPC provisioning either to Monitor or to stop monitoring the national and international bits in TS0, without removing the NPC from service.

---

### TS0M Spare Bit Meanings

The following list indicates the possible values each bit (abcdefgh) can have:

- 0 or 1 = Set TS0M bit to this value
  - P = Received bit is passed through (cross-connected unchanged)
  - "-" = Neither the variable nor TS0M bit is changed.
-

---

## **Change NPC Non-Frame Word Setting**

---

### **Overview**

DACS II allows control of the Non-Frame Word (NFW, TS0-abcdefghi). Each variable (a through i) may be set to a specific value for a desired performance.

---

### **NFW Bit Meanings**

The following list indicates the possible values each bit (abcdefghi) can have:

- 0 or 1 = Set NFW bit to this value
  - P = Received bit is passed through (cross-connected unchanged)
  - "-" = Neither the variable nor NFW bit is changed.
-

---

## Disconnect Two-way TS0 Circuit

---

**Overview** The user can request the disconnection of two-way, two-point TS0 cross-connect circuits or a range of cross-connected circuits.

---

**Channel Numbers** The channel numbers used in the broadcast connection are as follows:

- 000-023 for North American NPCs
- 000-030 for CEPT type NPCs grown as CAS
- 000-031 for CEPT type NPCs grown as NSA.

One of the channel numbers specified in the disconnection must be channel 000 (TS0), while the other channel number must be a number other than channel 000.

---

---

## **Disconnect Broadcast TS0 Circuit**

---

### **Overview**

DACS II provides the ability to disconnect up to eight tributary legs from the source of a broadcast TS0 cross-connection. The CONV (convert) keyword can be used to disconnect one-way tributaries from the broadcast circuit and convert the circuit to a two-way, two-point circuit.

---

### **Channel Numbers**

The channel numbers used in the broadcast connection are as follows:

- 000-030 for CEPT type NPCs grown as CAS
  - 000-031 for CEPT type NPCs grown as NSA.
-

## Cross-Connect, Change, Disconnect Subrate

### Overview

The following section contains information required to cross-connect, change or disconnect the following subrate circuits:

- Cross-Connect Two-Point Circuits
- Connect Multipoint Circuit (with DSPU)
- Connect 19.2-kb/s Multipoint circuit (with External MJU Shelf)
- Change Two-Point Terminate and Leave State
- Change Multipoint Master
- Disconnect Two-Point Circuit
- Disconnect Multipoint Branch
- Disconnect Multipoint Master.

---

## Cross-Connect Two-Point Circuit

### Overview

For a normal connection, DACS II provides a command which performs a terminated cross-connection of the FROM and TO subrate customers in both directions. The customer number fields (Table 5-5) are optional for DS0A terminations. If not specified, the default value is 01. For terminated connections the command performs a terminated cross-connection of the FROM and TO customers in both directions.

---

(Continued on next page)

## Cross-Connect Two-Point Circuit (Continued)

**Subrate Two-point** Figure 5-9 shows channels established to the subrate and a subrate cross-connection.

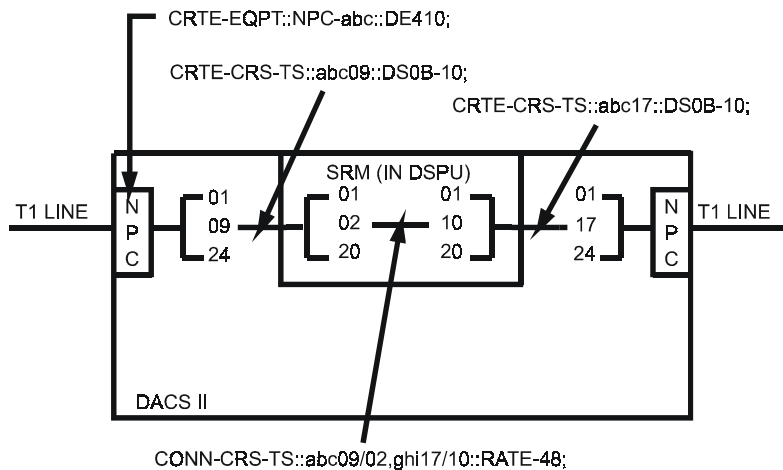


**Figure 5-9. Subrate Two-Point Cross-Connection**

## Cross-Connect Two-Point Circuit (Continued)

### Loopback Connection

To establish a loopback connection, the same numbers must be entered for the FROM and TO sides; loopback is not allowed with the SCNT command. The terminated connection sends the UMC (unassigned multiplexer code) on both sides of the connection as a preservice or testing condition.

### Subrate Circuit Rates

The subrate circuit rates available are:

- 2.4 kbit/s
- 4.8 kbit/s
- 9.6 kbit/s
- 56 kbit/s.

The rates must be equal to or lower than the rates of the customer signals.

### Customer Numbers

When cross-connecting subrate circuits, use Table 5-5 to enter the correct FROM and TO customer numbers. Specifying the customer number is optional for DS0A circuits.

**Table 5-5. Subrate Customer Numbers**

| Rate | DS0A<br>Numbers (Note 1) | DS0B Customer<br>Numbers (Note 2) |
|------|--------------------------|-----------------------------------|
| 2.4  | 01                       | 01 through 20                     |
| 4.8  | 01                       | 01 through 10                     |
| 9.6  | 01                       | 01 through 05                     |
| 56   | 01                       | 01                                |

**Notes:**

1. Range of channels allowed with DS0A
2. Range of customers allowed with DS0B



## Cross-Connect Multipoint Circuit (with DSPU)

### Overview

MJU circuits are configured by using DS0 cross-connect commands to establish the MJU control leg (specified as MJU 0001) and branches. The involved channels from the facility control leg and any branches must already be established to the substrate equipment. Figure 5-10 shows an example of channels established to the substrate and tandem MJU connections.

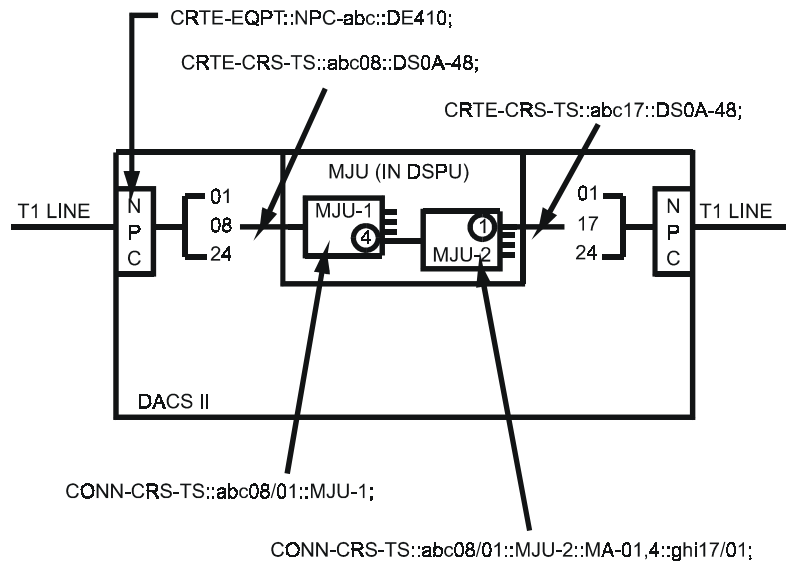


**Figure 5-10. Substrate Multipoint Cross-Connection**

## Cross-Connect Two-Point Circuit (Continued)

### Command Field Summary

Table 5-6 provides a summary of the fields in the cross-connection command.

**Table 5-6. Command Field Summary**

| Field      | Explanation                                                                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MPTM field | Multipoint master - NPC, channel, optional customer connected to the control leg of MJU 1. MJU 1 is always the first MJU in a tandem connection; the MPTM is used to identify the circuit. |
| MJU ssss   | Multipoint junction unit being addressed (1-9999).                                                                                                                                         |
| MA(tttt,u) | Master leg. Specifies MJU-to-MJU connection. Gives preceding MJU that MJU sss control leg connects to (tttt) and which branch it connects to on MJU tttt.                                  |
| branch     | External facility channel connected to                                                                                                                                                     |
|            | MJU ssss. One of four branches on addressed MJU.                                                                                                                                           |

### Multipoint Subrate Circuit Rates

The multipoint subrate circuit rates available are:

- 2.4 kbit/s
- 4.8 kbit/s
- 9.6 kbit/s
- 56 kbit/s.

The rates must be equal to or lower than the rates of any connecting leg or branch customer rates.

### Subrate Customer Number

Use Table 5-5 (shown previously) to enter the correct FROM and TO customer numbers. Specifying the customer number is optional for DS0A circuits.

## Connect 19.2-kb/s Multipoint Circuit (with External MJU Shelf)

### Overview

MJU circuits are configured by using DS0 cross-connect commands to establish the MJU control leg and branches. To use the external 19.2-kb/s MJU, DS0B customer signals must already be multiplexed into adjacent 9.6-kb/s subrate customer positions of a DS0 channel. This customer signal can then be cross-connected to the control leg of the MJU for bridging to the branches. Other MJUs can be connected in tandem to the first for additional bridging.

### MJU Channel Assignment

Each MJU plug-in connects to the DACS II by a DS1 line and contains the circuitry for four MJUs. These MJU circuits are accessed by the channel assignment in the DS1 signal. Up to 12 MJUs (for 12 DS1s) can be mounted on an MJU shelf.

Table 5-7 for the channel assignment in the DS1 signal going to the MJU plug-in

**Table 5-7. External MJU Channel Assignment**

| Channel | MJU Function      | Channel | MJU Function      |
|---------|-------------------|---------|-------------------|
| 1       | MJU 1 Control Leg | 13      | MJU 3 Control leg |
| 2       | MJU 1 Branch 1    | 14      | MJU 3 Branch 1    |
| 3       | MJU 1 Branch 2    | 15      | MJU 3 Branch 2    |
| 4       | MJU 1 Branch 3    | 16      | MJU 3 Branch 3    |
| 5       | MJU 1 Branch 4    | 17      | MJU 3 Branch 4    |
| 6       | Unused            | 18      | Unused            |
| 7       | MJU 2 Control Leg | 19      | MJU 4 Control leg |
| 8       | MJU 2 Branch 1    | 20      | MJU 4 Branch 1    |
| 9       | MJU 2 Branch 2    | 21      | MJU 4 Branch 2    |
| 10      | MJU 2 Branch 3    | 22      | MJU 4 Branch 3    |
| 11      | MJU 2 Branch 4    | 23      | MJU 4 Branch 4    |
| 12      | Unused            | 24      | T1DM Framing      |

## Connect 19.2-kb/s Multipoint Circuit (with External MJU Shelf) (Continued)

### Establishing DS0A and DS0B channels

With a DS0A signal on the channel, the channel is connected to the channels in the DS1 going to the MJU plug-in using CONN-CRS-T0 commands. With DS0B signals multiplexed on the channel, the channel from the customer facility and the channels from the MJU plug-in must be established to the DACS II DSPU (for additional information, refer to *Provisioning*). Once established, the subrate customer signals are cross-connected using CONN-CRS-TS commands.

### Trunk Conditioning

For establishing 19.2-kbit/s multipoint circuits the recommended trunk conditioning is TRSP,MUX.

### Circuit Rates

The 19.2-kbit/s multipoint subrate circuit rates available are:

- 9.6 kbit/s
- 56 kbit/s.

The rates must be equal to or lower than the rates of any connecting leg or branch customer rates.

### Customer Numbers

When cross-connecting subrate circuits, use Table 5-8 to enter the correct FROM and TO customer numbers. Specifying the customer number is optional for DS0A circuits.

**Table 5-8. Subrate Customer Numbers**

| Rate | DS0A<br>Numbers (Note 1) | DS0B Customer<br>Numbers (Note 2) |
|------|--------------------------|-----------------------------------|
| 9.6  | 01                       | 01 through 05                     |
| 56   | 01                       | 01                                |

**Notes:**

1. Range of channels allowed with DS0A
2. Range of customers allowed with DS0B

## **Change Two-Point Terminate and Leave State**

---

### **Overview**

Use this feature to change in the termination status of a cross-connected circuit (or range of circuits). Changing the termination state involves applying the terminated or released state on the multipoint circuit from the following sides:

- TO side
  - FROM side
  - BOTH sides.
-

---

## Change Multipoint Terminate and Leave State

---

### Overview

Use this feature to change in the termination status of a multipoint circuit. Changing the termination state involves applying the terminated or released state on the multipoint circuit from the following sides:

- TO side
- FROM side
- BOTH sides
- All legs toward bridge
- All legs toward facilities
- All legs in both directions.

---

### TO and BR Fields

The TO and BR fields in the change command control how the terminate and leave is applied. When BR is not used, the TO side faces the control leg downstream, and the FROM side faces upstream to the external facility termination or branch of cascaded MJU (for MJU other than 0001). When BR is used (for MJU other than 0001), the TO faces upstream to the branch of the specified MJU, and the FROM faces downstream to another MJU or facility termination.

---

---

## Change Multipoint Master

---

### Overview

This feature is used to change the external facility termination associated with the multipoint control leg of a subrate multipoint circuit from an existing digroup and channel to a new digroup and channel.

---

### Multipoint Branches

After changing the multipoint master leg, all branches are left with their existing external and internal connections. The external facility termination associated with the original connections is left established to the subrate feature with a UMC (unassigned multiplexer channel) code inserted towards the old facility.

---

---

## **Disconnect Two-Point Circuit**

---

### **Overview**

This feature is used to disconnect a subrate circuit in both directions.

---

### **FROM and TO Designations**

The FROM and TO designations enable the addressing of a direction of transmission in a subrate circuit (subrate is connected as a two-way circuit). FROM or TO can be either external facility for any subrate command. The association of FROM or TO to an external facility is valid only for the command in which it is being used. The next time you use the same command and external facilities, FROM or TO can be specified as the other external facility.

---



---

## **Disconnect Multipoint Branch**

---

### **Overview**

This feature disconnects up to four multipoint branch circuits from an MJU connection.

---

## **Disconnect Multipoint Master**

---

### **Overview**

This feature disconnects the MJU master leg and up to 20 additional MJUs cascaded from the MJU master leg. The MJU(s) will be deleted and customers will be disconnected from both directions.

---

## Re-Direct Cross-Connections

### Overview

This section provides information required to perform the following:

- Re-Direct DS0 Signals
  - Re-direct DS1 Signals.
- 

## Re-Direct DS0 Signals

---

### Overview

The DS0 "roll" capability allows cross-connected DS0 signals to be redirected onto other (unmapped) DS0 channels with minimal service interruption. This feature enables you to redirect one DS0 or a range of contiguous mapped DS0s within a DS1 signal.



**NOTE:**

The ROLL procedure will re-direct ALL cross-connections associated with the DS0 signal being rolled.

---

### DS0 Roll Steps

The three steps involved in the roll process are:

- Bridge - Bridge the DS0 signals
- Roll - Redirect the DS0 signals
- Cut - Disconnect the bridged circuits.

Of the three steps, minimum service interrupts only occur during the *roll* step. The DS0 signal being redirected can be part of a circuit of any type.

---

---

## Re-Direct DS0 Signals (Continued)

---

### **DS0 Roll Cross-connection Types**

The following four types of cross-connections can be redirected:

- Two point (one-way, two-way)
- Broadcast
- DMB (BBL and BRD legs)
- Subrate
- Virtual.



#### **NOTE:**

Circuits under test/testports cannot be re-directed.

---

### **Channel Range**

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 BDCST or virtual circuit (i.e., all the channels of a BDCST leg must be within the channel range of the ROLL command).

If the OLD NPC contains a 24-channel cross-connect with the AIS option, the ROLL command must have a 24-channel range.

---

---

## Re-Direct DS1 Signals

---

### Overview

The DS1 *roll* capability allows for redirection of all channels from an incoming facility from one DS1 port to another. This feature enables you to redirect one DS0 or a range of contiguous mapped DS0s within a DS1 signal.

The following two types of DS1 signals can be redirected:

- Channelized DS1
  - Clear DS1.
- 

### DS1 Roll Steps

The three steps involved in the roll process are:

- Bridge - Bridge the DS1 signals
- Roll - Redirect the DS1 signals
- Cut - Disconnect the bridged circuits.

Of the three steps, minimum service interrupts only occur during the *roll* step. The DS0 signal being redirected can be part of a circuit of any type.

---

### DS1 Roll Cross-connection Types

Each channel within a channelized DS1 can be of the following circuit types:

- Two-point (one-way or two-way)
- Virtual conference
- Broadcast circuit
- DMB leg
- Subrate channel.

A clear DS1 can be of the following circuit types:

- Two-point (one-way or two-way)
- Broadcast circuit.

**NOTE:**

Circuits under test/testports cannot be re-directed.

---

## **Re-Direct DS1 Signals (Continued)**

---

### **Channels on DSP Cards**

Channels on facility terminating NPCs that connect to a DSP application can be rolled. Channels on DSP application cards, of course, cannot be rolled because the NPCs on the cards are not facility terminating NPCs.

---

## **Network Element**

---

### **Overview**

A network element is a term used to specify the cross-connect system (such as the DACS II) in the network.

This feature allows the redirecting DS1 signals to a network element.

---

## **Non-Network Element**

---

### **Overview**

If a spare facility is not available to perform a coordinated roll with another network element, you can redirect an entire traffic carrying DS1 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.

---

### **Bridging Repeater**

A bridging repeater is used in this process. A bridging repeater is a piece of external equipment that is attached to the DACS II to provide an alternate path for a signal without degrading the signal.

---



## DSP Application Connections

### Overview

This section provides information for the following:

- Cross-connect, change, or disconnect DSP application connections
  - DSP Platform application-to-application cross-connections.
- 

## Cross-Connect, Change, or Disconnect DSP Application Connections

---

### Overview

For general tasks on provisioning DSP circuits, refer to the specific application manual. However, it is possible to remove DSP cross-connections only if the application is incapable of disconnecting a circuit or a range of circuits between:

- A DSP NPC and a facility terminating NPC
  - Two DSP NPCs.
- 

### Channel Numbers

The channels numbers available for disconnection are:

- 001-024 for DE-, DA-, TE-, and TA-type NPCs
  - 000-031 for PA-, PB-, PC-, and TH-type NPCs
  - 001-064 for SD-type NPCs (except channels with numbers divisible by 4).
-

---

## DSP Platform Application-to-Application Cross-connections

---

### Overview

Channels on Digital Signal Processing (DSP) Platform Applications may be cross-connected to/disconnected from each other through the DACS II cross-connect network. The commands for performing these functions are documented in the manual for each individual application. However, it is possible to query for the cross-connections established between applications through a DACS II utility command.

---

### Pseudo Channel Number

Application-to-application cross-connections can only be established by entering complimentary commands on both applications that are to be cross-connected. A unique number, a so called pseudo channel, ties the two requests together. Cross-connections between two application cards are established by first using the NPC number of the second application card and the pseudo channel number in a cross-connect request to the first application card. Then a complimentary command is sent to the second application card referring to the NPC number of the first application card and the pseudo channel number. DACS II matches the requests from the two applications that have requested to be cross-connected by matching the pseudo channel numbers in both requests.

---

### Application-to-Application Cross-connection Reports

The query output reports by pseudo channel number the actual application NPC numbers and associated channel numbers that are cross-connected to each other. If only one of the two required cross-connect requests has been received, then the second application channel number is shown as dashes. No actual cross-connect exists when the second channel number is not shown. For additional information, refer to command I.51201 in the *DACS II Command and Message Manual* for more detail.

---

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**Background**

---

**Introduction**

The Frame Administrator sets the database to recognize the user and to set limits on what functions and views the user can perform. System Administration can be performed by users directly or through links to the DACS II. A user is known to DACS II by a login and password. Links are known to DACS II by the physical port that is connected to the terminal. After a user is added, the user can log in on any designated in-service link.

---

**Objectives**

This chapter provides information to perform the following:

1. Perform Frame Administrative Functions
  2. Log-On/Log-Off the System
  3. Change Passwords
  4. Create/Edit Alternate Maps
  5. Create/Edit Macros.
- 

**Related Information**

For related information, refer to the:

- *DACS II Command and Message Manual*
  - *DACS II Installation Manual.*
-

---

## Background (Continued)

---

### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

|                                                                      |         |
|----------------------------------------------------------------------|---------|
| ■ Add/Delete User                                                    | GT 6.1  |
| ■ Recover Password for User DAX                                      | GT 6.2  |
| ■ Reinstate User with Forgotten Password                             | GT 6.3  |
| ■ Log Off Another User                                               | GT 6.4  |
| ■ Change Input Command Priority and<br>Restricted Maintenance Option | GT 6.5  |
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| ■ Change NPC Addressing                                              | GT 6.7  |
| ■ Change Output Message Screening                                    | GT 6.8  |
| ■ Change Macro/Map Storage Space                                     | GT 6.9  |
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| ■ Execute Macro Package                                              | GT 6.21 |
| ■ Query User Macro Information                                       | GT 6.22 |
| ■ Delete Macro from System                                           | GT 6.23 |

---



---

## Frame Administrator Functions

---

### Overview

The Frame Administrator can establish and change various parameters in the frame. This ability is reserved only for operators logged in as the frame administrator and cannot be transferred to any other user. Machine responses (output messages) to commands that are unique to the frame administrator appear only at the terminal at which they were entered. The frame administrator also sets the system language of either PDS or MML.

---

### Login and Password

DACS II only recognizes the person who logs in as User DAX as the frame administrator. DAX is the only user that does not have to be created because it is embedded in the system software. However, any operator on any link can become the frame administrator by logging in as DAX.

While it is not possible to change DAX as the frame administrator login, it is possible to change the password. The password associated with the login DAX is the only way to control access to frame administration features.

---

### Functions

The following functions are controlled only by the Frame Administrator:

- Recover User DAX password
  - Add/Delete User
  - Reinstate a user who has forgotten their password
  - Log Off other users
  - Change input command priority and restricted maintenance option
  - Change message language
  - Change NPC addressing
  - Change output message screening
  - Change User's Macro/Map storage space
  - Change link removal permission option.
- 

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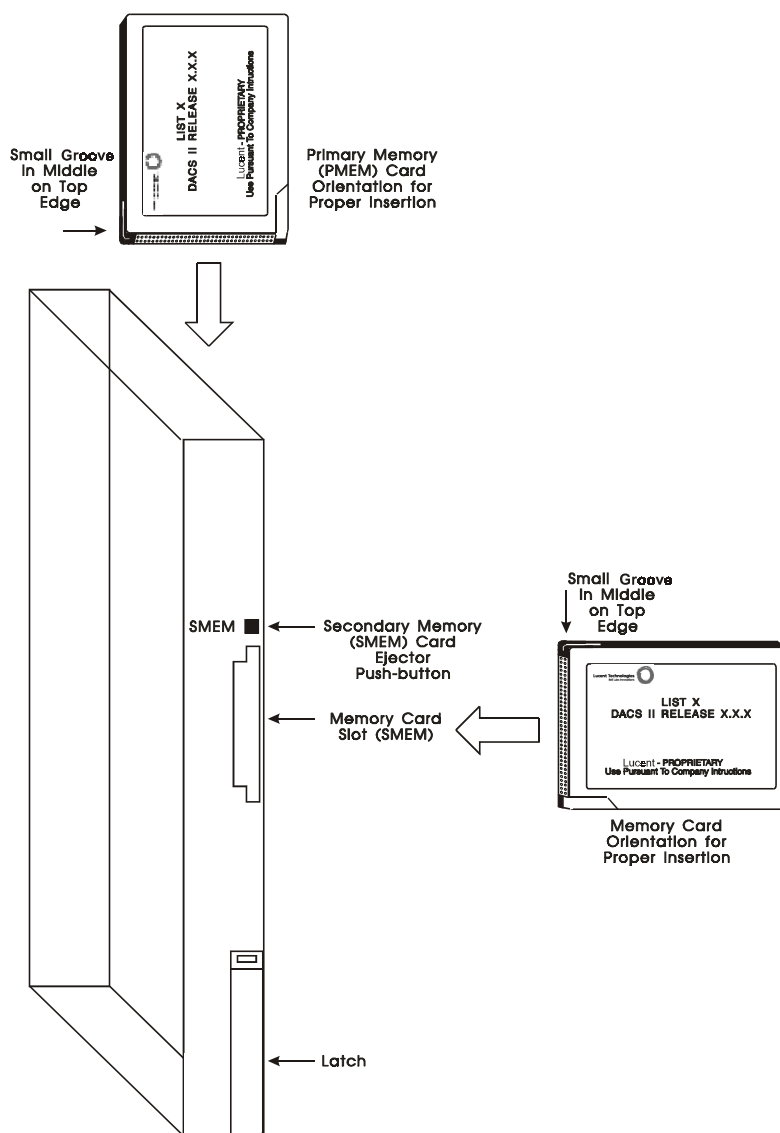


**Figure 6-1. Memory Card Locations on CPU2**

## **Frame Administrator Functions (Continued)**

---

**Recover User DAX Password**      The DACS II PASSWORD RECOVERY CARD (Version 1) is used to recover the original (default) user DAX password. This card is a unique 1.8 Mb flash card that contains just enough information to move the default password to RAM memory. A specific general task is provided to assist in the use of the card for the recovery of the original (default) user DAX password (Table 1-1).

---

**Add/Delete User**      Only the frame administrator adds or deletes users from the database. The user id must be 2 to 8 alphabetic characters and the password must have 6 characters: at least 2 must be alphabetic and 1 must be numeric (except for temporary password given by the frame administrators new user, any special character can be used instead of a number. Command execution priority levels for the user are established during link provisioning.

---

**User Priority Levels**      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.

---

**Command Grouping and Screening Options**      The frame administrator can set the parameters for a user or a link. These parameters will allow the user to use specific commands or view specific outputs. Screening also allows blocking groups of messages or including messages associated with other links. Table 1-1 lists the command groupings and Table 6-2 lists the screening options.

---

(Continued on next page)

**Table 1-1. Command Groupings**

| <b>a</b><br>Circuit Provisioning                                                                                                                                                                                         | <b>b</b><br>Equip Provisioning                                                                                                                                                                 | <b>c</b><br>Maintenance                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALW-SW-T1<br>CONN-BDCST-T0<br>CONN-CRS-T0<br>CONN-CRS-TS<br>CONN-CRS1-T0<br>CRTE-CRS-TS<br>DLT-CRS-TS<br>DISC-BDCST-T0<br>DISC-CRS-T0<br>DISC-CRS-TS<br>DISC-CRS1-T0<br>INH-SW-T1<br>SW-TOPROTN-T1<br>SW-TOWKG-T1        | CRTE-CNFGRN-EQPT<br>CRTE-EQPT<br>CRTE-LGN<br>DISC-EQPT<br>DLT-LGN<br>DLT-MACRO<br>DLT-MAP<br>DLT-PRMTR-EQPT<br>ED-PRMTR-EQPT<br>ED-PRMTR-LINK<br>ED-PRMTR-NE<br>SET-PRVG-TERM<br>SET-PRVG-USER | DGN-EQPT<br>ED-PRMTR-EQPT<br>ENT-EQPT<br>INIT-SYS<br>RMV-CNFGRN-EQPT<br>RMV-EQPT<br>RST-CNFGRN-EQPT<br>RST-EQPT<br>SW-DX-EQPT<br>-<br>-                                                                                        |
| <b>d</b><br>Test Access                                                                                                                                                                                                  | <b>e</b><br>Monitoring                                                                                                                                                                         | <b>f</b><br>Common                                                                                                                                                                                                             |
| ALW-LPBK-T1<br>CHG-TL-T0<br>CHG-TL-TS<br>CONN-HUB-T0<br>CONN-TACC-T0<br>CONN-TACC-TS<br>DISC-TACC-T0<br>DISC-TACC-TS<br>INH-LPBK-T1<br>OPR-LPBK-T0<br>OPR-LPBK-T1<br>RLS-LPBK-T1<br>-<br>-                               | CPY-MEM<br>ED-DATE<br>INIT-LOG<br>INIT-REG<br>OPR-ACO-ALL<br>RST-PASSWD<br>SCHED-PMREPT-ALL<br>SET-ATTR-EQP<br>STA-LOCL-RST<br>RTRV<br>-<br>-                                                  | CHG-LGN<br>CHG-RPATH-T0<br>ED-CNFGRN-EQPT<br>ED-CONN-TS<br>ED-CRTE-TS<br>ED-OPT-T1<br>ED-PRMTR-EQPT<br>ED-PRMTR-MACRO/MAP<br>ED-PRMTR-NE<br>ED-PRMTR-T0<br>ED-PRMTR-TS<br>ENT-MACRO/MAP<br>EXC-MACRO/MAP<br>SET-PRVG-TERM/USER |
| <b>g</b><br>Restricted Maintenance (RMON Option)                                                                                                                                                                         |                                                                                                                                                                                                |                                                                                                                                                                                                                                |
| CPY-MEM:::PMEM,SMEM:PROG;<br>DLT-FPKG;<br>ED-PRMTR-ALMS:::{ON OFF};<br>ED-PRMTR-INTV:::{ON OFF};<br>ED-PRMTR-MSGLOG:::{ON OFF};<br>INIT-MSGLOG:::RSTNUM;<br>RST-EQPT::MC::FRC;<br>RST-EQPT::SMEM::CLR:FRC;<br>UPGRD-SYS; |                                                                                                                                                                                                |                                                                                                                                                                                                                                |

(Continued on next page)

**Table 6-2. Screening Options**

| <b>Screening Option (n)</b> | <b>Definition</b>                                                                                                                                                                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                      |

---

## Frame Administrator Functions (Continued)

---

### Reinstate a User That Has Forgotten the Password

The frame administrator has the ability to reinstate a user that has forgotten the password by assigning a temporary password by entering the appropriate command. After the temporary password is set, the user can reassign his/her personal password.

---

### Log Off Another User

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 Input Command Priority

The frame administrator has the ability to change the 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.

---

(Continued on next page)

---

## Frame Administrator Functions (Continued)

---

### Restricted Maintenance Option

The frame administrator can set the restricted maintenance option (RMON/RMOFF) which determines whether the user has permission to use commands in that category. When the RMON option is enabled, a link or a specified user can execute any of the restricted maintenance commands listed in Table 6-1.

---

### Change Message Language

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.

---

### Change NPC Addressing

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.

---

(Continued on next page)

---

## Frame Administrator Functions (Continued)

---

### **Change Output Message Screening**

Output message screening (Table 6-2) 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.

---

### **Change User's Macro/Map Storage Space**

DACS II provides commands to check and change the user's current macro/map storage space. 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.

---

### **Change Link Removal Permission Option**

The frame 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.

---



---

## Log-On/Log-Off

---

### 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.

---

### Login Modes

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.
- 

### Choosing a Password

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.
- 

(Continued on next page)

## **Log-On/Log-Off (Continued)**

---

### **Log Off the System**

When logging off the system, the user ID and link number must be specified. Only the frame administrator can log-off another user.

---

### **Change Password**

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.

---

---

## Alternate Maps

---

### Overview

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. 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.

---

### Enhanced Alternate Map

The enhanced alternate map feature allows the establishing of alternate maps for clear NPCs for DS1/E1 facilities. Additionally, the mixing of channelized and clear NPCs is allowed. This feature applies to TH, PA, TE, TA, DE, and DA type NPCs.

---

### Alternate Map Naming Rules

Users must assign names to alternate maps. These names are associated with the user so that the map can only be accessed by the user who created it. A user can edit, activate delete or query only their own alternate map. The rules for naming alternate maps are as follows:

- First character must be alphabetic
- Name can be alpha or alphanumeric
- All alpha characters must be capitalized
- Number of characters must not exceed seven
- Name must not be DACS Keywords.

**NOTE:**

Only users with USER IDs who access the system via a login can use the alternate map feature.

---

(Continued on next page)

---

## Alternate Maps (Continued)

---

### Creating Alternate Maps

The user will enter the command to create an alternate map and follow the rules for naming. DACS II cannot deny the end of a create session. Even if the map contains an error, a conditional completion message is generated. If there are no errors, the CONDitional code is 00. A conditional completion message other than 00 indicates that the map has a problem such as two connections to the same location in the map. The output message details the problem. The user must clear the problem, or the map is considered non-valid and will not work. Existing cross-connections that are not involved in the alternate map are not affected when the map is activated, but all involved terminations are overwritten by the new map.

---

### Alternate Map Example

The following is an example of an alternate map:

```
ENT-MAP:[xy]::[ww]:NEWMAP;  
CONN-CRS-T0::01-1-01-01,01-1-02-01::TRSP;  
CONN-CRS-T0::01-1-03-01,01-1-04-01::TRSP;  
CONN-CRS-T0::01-1-05-01&&-24,01-1-06-01&&-24::TRSP;  
END
```

---

**Figure 6-2. Example of Alternate Map**

---

### Create Alternate Map Using the Picture Option

The PIC option of the 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. The PIC option is now supported for clear, two-way cross-connections.

Once an alternate map is created, it does not matter whether the creation was manual or via the picture feature.

---

### Alternate Map Using Picture Option Example

The following is an example of an alternate map using the PIC option:

```
ED-MAP::::DUBLIN1;  
ED-ADD-MAP::NPC 001&&-005;  
ED-ADD-MAP::NPC 007&-010;  
END;  
ED-PRMTR-MAP::::DUBLIN2,DUBLIN1;  
RTRV-MAP-COM::::DUBLIN2;  
EXC-MAP::::DUBLIN2;
```

---

**Figure 6-3. Example of an Alternate Map Using the Picture Option**

---

---

## Alternate Maps (Continued)

---

### Reference Map for 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 provided command to list the NPCs in the reference map. After creating your reference map, create the new alternate map using the command with the PIC option.

**NOTE:**

Only users with USER IDs who access the system via a login can use the alternate map feature.

---

### Reference Map Example

The following is an example of a reference map identifying the active cross-connections:

```
ENT-MAP:[xy]::[ww]:NEWMAP;  
ED-ADD-MAP::NPC-01-1-07&&&-01-1-12;  
END
```

---

**Figure 6-4. Example of a Reference Map**

---

### Change New Map

Once the new map is created, it can be changed as described in the following section. 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.

---

(Continued on next page)

---

## Alternate Maps (Continued)

---

### **Edit an Existing Alternate/Reference Map**

When editing an existing map, you will not see the previous entries, the user must view the contents of the map by name. The user may perform the following changes/additions to the map:

- Add new cross-connections
- Remove cross-connections
- Add NPCs to a reference map
- Remove NPCs from a 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.

---

### **Activate Alternate Map Package**

#### **Description**

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.

#### **CLR Option**

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, specified in the Activate Alternate Map command, causes the system to disconnect existing connections on the involved NPCs before making the cross-connections listed in the map.

---

(Continued on next page)

---

## Alternate Maps (Continued)

---

### Activate Alternate Map Package, Continued

#### CLR Option Cautions

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 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.



#### CAUTION:

*Performing this general task incorrectly can interrupt service. Perform each step in the order given. Also, read all supplementary information (such as Notes) before executing commands.*

---

### Query User Map Information

The user may retrieve the following alternate map information from the system:

- Filename List and Execution Attributes
- Contents of the Map
- Listing of NPCs in the Map
- Allotted Map File Storage Space.

---

### Delete Alternate Map from 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.

---

---

## Macros

---

### Overview

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.

---

### Universal Macros

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

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. 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.

The following types of editing are used to create or modify your macro package.

- Append - "append" new lines *after* the line specified. When beginning a new macro, append after line 0.
- Delete - delete the line specified
- Move - move a line (or group of lines) to a place after a specified line
- List - lists the lines or range of lines or lines specified.

**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.

---



## Macros (Continued)

---

### Macro Naming Rules

The following rules apply for naming a macro:

- 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)
- 

### Tips When Creating Macros

Consider the following when creating macros:

- SET PRVG commands can be included in a macro to shut off (MCOFF) macro component COMPLD messages.
  - A STOP keyword can be included in component RMV-EQPT/RST-EQPT, CONN, and DISC commands to stop the macro if a component command fails.
-

---

## Macros (Continued)

---

### Macro Example 1

This example shows how to create a macro. Figure 6-5 shows the component commands in the macro that do the following:

- **Line 1.** This command disconnects channel 01 of NPC 001 from channel 01 of NPC 003. If the command fails, the macro stops.
- **Line 2.** This command cross-connects channel 01 of NPC 001 to channel 01 of NPC 005. (The connection uses transparent trunk conditioning.)
- **Line 3.** This command cross-connects channel 02 of NPC 001 to channel 02 of NPC 005. (The connection uses transparent trunk conditioning.)
- **Line 4.** This command cross-connects channel 03 of NPC 001 to channel 03 of NPC 005. (The connection uses transparent trunk conditioning.)
- **Line 5.** This line outputs all connections on NPC 001.

```
DISC-CRS-T0::001-01,003-01:::STOP;OK  
CONN-CRS-T0::001-01,005-01::TRSP;OK  
CONN-CRS-T0::001-02,005-02::TRSP;OK  
CONN-CRS-T0::001-03,005-03::TRSP;OK  
RTRV-CRS-T1::001::MAP;OK
```

---

**Figure 6-5. Example of Macro (Extended NPC Numbering)**

---

---

## Macros (Continued)

---

### Macro Example 2

Figure 6-6 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 , 01-1-01, the last line entered in the example would be:

**RTRV-CRS-T1 : :#01-#02-#03 : :MAP ;**

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) ;**

**DISC-CRS-T0 : :#01-#01-#01-#01, #01-#01-#02-#01 : : : STOP ;**

**CONN-CRS-T0 : :#01-01, #02-01 : :TRSP ;OK**

**CONN-CRS-T0 : :#01-02, #02-02 : :TRSP ;OK**

**CONN-CRS-T0 : :#01-03, #02-03 : :TRSP ;OK**

---

**Figure 6-6. Example of Macro (Extended NPC Numbering)**

---

---

## Macros (Continued)

---

### **Execute 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 COMPLD or DENY 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.

---

### **Enter Command to Query User Macro Information**

The following macro information can be retrieved from the system:

- Filename List
  - Contents of the Macro
  - Allotted Map/Macro File Storage Space.
- 

### **Delete Macro from 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.

---

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---

**Background**

---

**Introduction**

This chapter provides information required to upgrade software, database archiving, memory card recovery and to upgrade/replace circuit packs.

---

**Objectives**

This chapter provides information to perform the following:

1. Software Installation
  2. Database Archiving
  3. Recover from Memory Card Failure
  4. Repair and Replace Circuit Packs.
-

## **Background (Continued)**

---

### **Related Tasks**

For related tasks, refer to the following General Tasks in Volume II:

- |                                          |        |
|------------------------------------------|--------|
| ■ Archiving the Database                 | GT 7.1 |
| ■ Recovering after Memory Card Failure   | GT 7.2 |
| ■ Removing a Single-Latch Circuit Pack   | GT 7.3 |
| ■ Installing a Single-Latch Circuit Pack | GT 7.4 |
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| ■ Installing a Double-Latch Circuit Pack | GT 7.6 |
| ■ Upgrading to an ICI                    | GT 7.7 |
| ■ Upgrading From an EMTC to a EMTC2      | GT 7.8 |
-



## Software Installation

---

### Software Installation for a New Release

To install a new software release, refer to the *DACS II Release 9.0 Software Release Description*.

---

### Software Installation for DSP Applications

The DACS II INSTALL command performs installation services for application releases. These services are:

- Listing application releases currently installed
- Installation of a new application release
- Upgrading an older release of an application with a newer release of that application
- Removal of an application release.

For additional information on performing each of these services, refer to the specific DSP Platform application manual.

---

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## Database Archiving

---

**Overview** 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.

---

**Archiving Benefit** The operation of archiving the database and executables allows you to recover from a failed PMEM and/or SMEM hardware, that may leave the database on either (or both) the SMEM and PMEM flash cards suspect.

---

**Archive Card** The archive card resulting from these operations 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.

---

**Mirroring Process** 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 command. **RST-EQPT : :SMEM** command.



**NOTE:**

The procedure assumes the MC, PMEM, and SMEM are functioning properly and the database in RAM and on PMEM are correct.

---

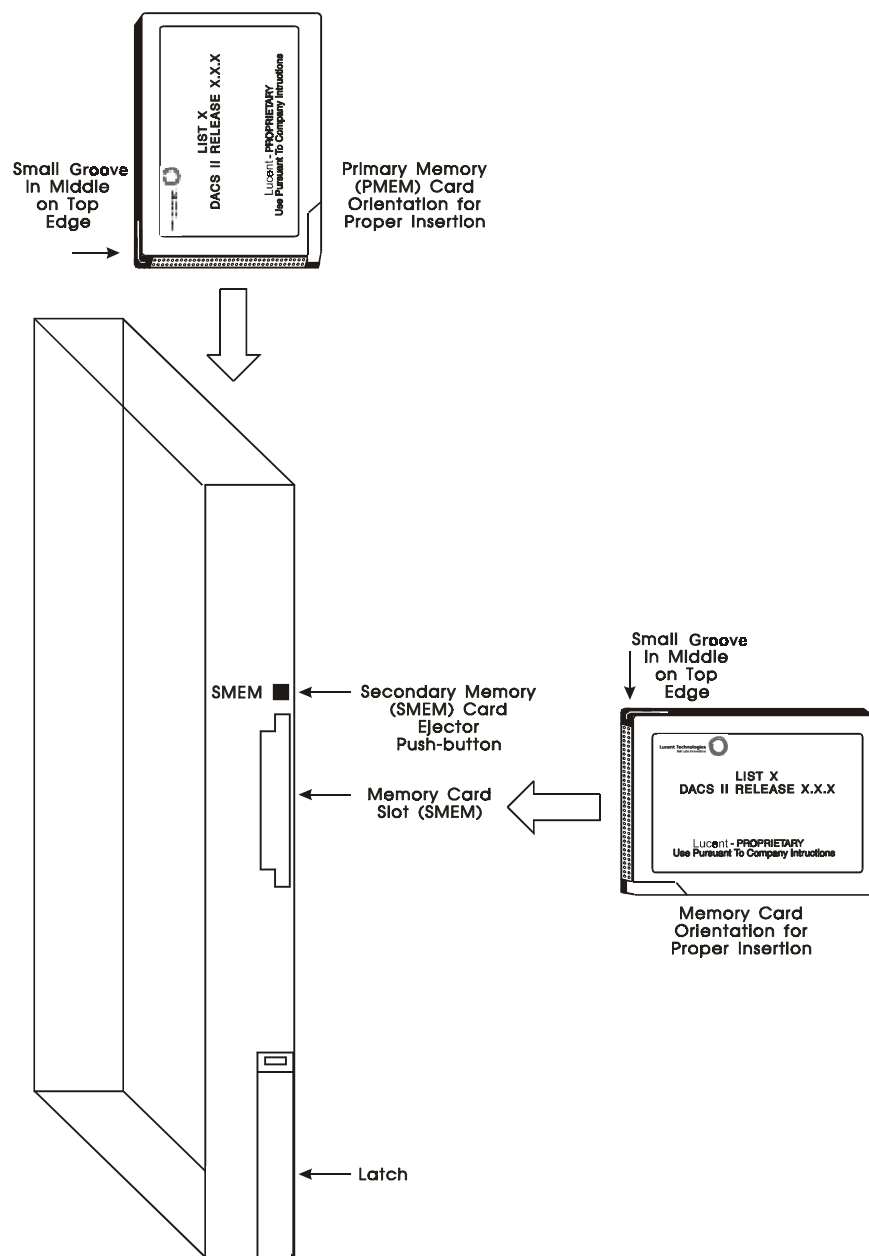


**Figure 7-1. Memory Card Locations on CPU2**

## **Memory Card Failure Recovery**

---

### **Overview**

The PMEM and SMEM cards (Figure 7-1) provide dual, non-volatile storage and protect the memory of the DACS II database in the event of a failure. The Memory cards are automatically updated after every ten minutes if the state of the frame has changed. When a second memory card is restored to service, the MC automatically attempts to duplicate the contents of the other card. Each card is then a “mirrored image” of the other.

---

### **Diagnostic Tests**

DACS II provides the following diagnostic tests for both the PMEM and SMEM cards for failure recovery:

- Card diagnostic test, craft code X'0004
  - Validate data base test, craft code X'0010
  - Validate the boot block, craft code X'0020
  - Validate executable header, craft code X'0040
  - Validate executables, craft code X'0080.
-

## Memory Card Failure Recovery (Continued)

### Test Results and Action Items

Table 7-1 lists several possible cases which can result from performing the diagnostic tests along with actions items to resolve the problems:

**Table 7-1. Test Results and Action Items**

| <b>PMEM</b>                               | <b>SMEM</b>                               | <b>Action Item</b>                                                                                                                                        |
|-------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fail Diagnostics                          | Pass All                                  | Replace the PMEM card with the card currently in the SMEM slot (PMEM card is suspected to be defective)                                                   |
| Pass diagnostic but fails any other tests | Pass All                                  | Replace the PMEM card with the card currently in the SMEM slot (PMEM card is suspected to contain corrupted executables or database)                      |
| Pass diagnostic but fails any other tests | Pass diagnostic but fails any other tests | Replace the PMEM card with the most recently archived memory card (PMEM and SMEM cards are suspected to contain corrupted executables or database)        |
| Pass All                                  | Fail Diagnostics                          | Replace the SMEM card with a spare memory card or with an older archive card that may be recycled.<br>(SMEM card is suspected to be defective.)           |
| Pass All                                  | Pass diagnostic but fails any other tests | The SMEM card is good but has bad information on it.<br>Restore the SMEM card.<br>(The PMEM contents are copied onto the SMEM card when SMEM is restored) |

---

## 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.

**NOTE:**

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND). Both NPCs associated with a DDC or EDDC should be out of service before the pack can be physically removed/replaced. Entities such as UCs, FTMIIs, and FCs should be OOS before they are physically removed/replaced.

---

### Cautions

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

**CAUTION:**

*The following cautions apply:*

1. 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 (tested per your company's ESD policy) provided with the equipment.
  2. Never install or remove more than one circuit pack at a time. This could cause irreparable damage to each circuit pack.
  3. Neither the 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.
-

## **Upgrade/Replacing Circuit Packs**

---

### **Overview**

This section provides information required to upgrade or replace circuit packs for the following:

- Upgrading From a CI to an ICI
- Upgrading From an EMTC to an EMTC2.



**NOTE:**

Reset may take up to 30 minutes.

---

### **Upgrading from a CI to a ICI**

The upgrade involves changing from a Communication Interface (CI) circuit pack to an Intelligent Communications Interface (ICI) circuit pack. This requires a software upgrade to Release 9.0. Refer to the DACS II Software Release Description for the procedure.

The procedure assumes that ICI links 1 through 7 are all provisioned. For a CI circuit pack, links 1 through 6 can only be used with SNIDER protocol. For an ICI circuit pack, links 1 through 4 can be used for SNIDER protocol. Links 5 and 6 can be used for X.25 protocol. Link 7 is used for TELNET connectivity to the DACS II system.

---

### **Upgrading from an EMTC to an EMTC2**

The upgrade involves changing from the UM56 Enhanced Maintenance (EMTC) circuit pack to the UM75 Enhanced Maintenance (EMTC2) circuit pack. The EMTC2 circuit pack has additional maintenance functionality.

---





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**Background**

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**Introduction**

DACS II monitors the system for DS1 and HDS3 path and line performance. The facility performance parameters monitored by an NPC are either bits received in error or service outages as a function of time. Only counts that exceed current threshold levels cause threshold-crossing messages or alarms. A command is available to schedule a performance monitoring report at scheduled times. DACS II also provides “command and leave” test signals.

---

**Objectives**

This chapter provides information to perform the following:

1. DS1 and HDS3 Line and Path Performance
  2. Change Performance Parameter Thresholds
  3. Schedule, Check, and Clear Performance Monitoring Data
  4. Setting Hybrid DS3 Daily Facility Alarm Reporting Time
  5. Activate/Deactivate Facility Test Signals
  6. Activate/Deactivate Facility Loopback.
-

---

## Background (Continued)

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### Related Tasks

For related tasks, refer to the following General Tasks in Volume II:

- |                                                                                   |          |
|-----------------------------------------------------------------------------------|----------|
| ■ Change Performance Parameter Thresholds                                         | GT 8.1   |
| ■ Scheduling a Performance Monitoring Report                                      | GT 8.2   |
| ■ Checking Performance Monitoring Data                                            | GT 8.3   |
| ■ Clearing Performance Monitoring Data                                            | GT 8.4   |
| ■ Setting the Hybrid DS3 Daily Facility Alarm Reporting Time                      | GT 8.5   |
| ■ Setting the Hybrid DS3 Daily Facility Alarm Reporting Time                      | GT 8.6   |
| ■ Checking Hybrid DS3 Performance Monitoring Data                                 | GT 8.7   |
| ■ Clearing Hybrid DS3 Performance Monitoring Data                                 | GT 8.8.1 |
| ■ Initialize/Change Hybrid DS3 Threshold Values                                   | GT 8.9   |
| ■ Change Threshold Selections for DS3 Units                                       | GT 8.10  |
| ■ Query Hybrid DS3 Performance Parameters                                         | GT 8.11  |
| ■ Activate/Deactivate Facility Test Signals                                       | GT 8.12  |
| ■ Activate/Deactivate Facility Loopback                                           | GT 8.13  |
| ■ Activate/Deactivate Facility Loopback for TE or TH Type NPC within a Hybrid DS3 | GT 8.14  |
| ■ Check and Operate Hybrid DS3 Loopback                                           | GT 8.15  |
-

---

## DS1 Line Performance

---

### Overview

A DS1 line is defined by the network endpoints at which the DS1 line coding is generated and terminated. The following DS1 line performance parameters are monitored by DACS II:

- Line Coding Violations (CV)
  - Line Errored Seconds (ES)
  - Line Severely Errored Seconds.
- 

### Line Coding Violations

Line Coding Violations (CV) provides a count of CVs based on the DS1 line format.

- AMI line coding is a count of bipolar violations (BPV)
  - B8ZS line coding is a count of BPVs that are not part of the zero substitution pattern. For B8ZS-coded lines, unexpected bit sequences such as 8 or more consecutive zeros are also a BPV.
- 

### Line Errored Seconds

Line Errored Seconds (ES) is a count of seconds during which at least one CV has occurred.

---

### Line Severely Errored Seconds

Line Severely Errored Seconds (SES) is a count of seconds during which at least 1544 line CVs have occurred.

---

---

## DS1 Path Performance

---

### Overview

A DS1 path is defined by the network endpoints at which the DS1 frame structure is generated and terminated. The following DS1 path performance parameters are monitored by DACS II:

- Path Coding Violations (CV)
  - Path Errored Seconds (ES)
  - Path Severely Errored Seconds (SES)
  - Path Severely Errored Framing Seconds (SEFS)
  - Path Controlled Slip Seconds (CSSP)
  - Path Unavailable Seconds (UASP).
- 

### Path Coding Violations

Path Coding Violations (CV) for ESF framing is a count of detected CRC-6 CVs, for D4 framing is a count of detected framing bit errors.

---

### Path Errored Seconds

Path Errored Seconds (ES) is a count of seconds during which at least one of the following has occurred:

- Path CV
  - Controlled slip
  - SEF event.
- 

### Path Severely Errored Seconds

Path Severely Errored Seconds (SES) for ESF framing, this parameter is a count of seconds which either 320 or more CRC-6 CVs or an SEF event has occurred. For D4 framing, this parameter is a count of seconds during which either 8 or more framing bit errors or an SEF event has occurred.

---

### Path Severely Errored Framing Seconds

Path Severely Errored Framing Seconds (SEFS) is a count of seconds during which at least one SEF event has occurred.

---

(Continued on next page)



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**DS1 Path Performance (Continued)**

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**Path Controlled  
Slip Seconds**

Path Controlled Slip Seconds (CSSP) is a count of seconds during which a controlled slip has occurred.

---

**Path Unavailable  
Seconds**

Path Unavailable Seconds (UASP) is a count of seconds from the onset of the condition that causes an Unavailable Signal Status to be declared to the onset of the condition that causes it to be cleared.

---

## Performance Parameter Thresholds

### Overview

DACS II provides the user with the ability to change the following performance parameter threshold values:

- Default Threshold Values
- Threshold Values on an NPC
- Threshold Values on NPCs of a particular type
- Threshold Values on one or more NPCs of a particular type or *SLC*®.

### Performance Parameter Thresholds

Table 8-1 lists the default performance parameter thresholds:

**Table 8-1. Default Performance Parameter Thresholds**

| Parameter            | Number/Day | Number/15 Minutes |
|----------------------|------------|-------------------|
| Line CVs (BPVs)      | 133,400    | 13,340            |
| Path CVs (CRCs)      | 132,960    | 13,296            |
| Path CVs (FEs in D4) | 691        | 72                |
| CSSP                 | 4          | 1                 |
| SEFS                 | 17         | 2                 |
| Line/Path ES         | 648        | 65                |
| Line/Path SES        | 100        | 10                |
| UASP                 | 10         | 10                |

(Continued on next page)

## Performance Parameter Thresholds (Continued)

### rr Parameter

Table 8-2 provides the facility performance parameter number when changing the threshold values:

**Table 8-2. rr Parameter**

| rr | Parameter                                           |
|----|-----------------------------------------------------|
| 41 | Daily near-end path coding violations               |
| 42 | Daily near-end path errored seconds                 |
| 43 | Daily near-end path severely errored seconds        |
| 44 | Daily near-end severely errored framing seconds     |
| 45 | Daily near-end path controlled slip seconds         |
| 46 | Daily near-end path unavailable seconds             |
| 47 | Daily near-end line coding violations               |
| 48 | Daily near-end line errored seconds                 |
| 49 | Daily near-end line severely errored seconds        |
| 50 | Daily far-end path coding violations                |
| 51 | Daily far-end path errored seconds                  |
| 52 | Daily far-end path severely errored seconds         |
| 53 | Daily far-end severely errored framing seconds      |
| 54 | Daily far-end path controlled slip seconds          |
| 55 | Daily far-end path unavailable seconds              |
| 56 | Daily far-end line errored seconds                  |
| 57 | 15-minute near-end path coding violations           |
| 58 | 15-minute near-end path errored seconds             |
| 59 | 15-minute near-end path severely errored seconds    |
| 60 | 15-minute near-end severely errored framing seconds |
| 61 | 15-minute near-end path controlled slip seconds     |
| 62 | 15-minute near-end path unavailable seconds         |
| 63 | 15-minute near-end line coding violations           |
| 64 | 15-minute near-end line errored seconds             |
| 65 | 15-minute near-end line severely errored seconds    |
| 66 | 15-minute far-end path coding violations            |
| 67 | 15-minute far-end path errored seconds              |
| 68 | 15-minute far-end path severely errored seconds     |
| 69 | 15-minute far-end severely errored framing seconds  |
| 70 | 15-minute far-end path controlled slip seconds      |
| 71 | 15-minute far-end path unavailable seconds          |
| 72 | 15-minute far-end line errored seconds              |

## Performance Monitoring Report

### Overview

A user may schedule a performance monitoring report on a single NPC or a range of NPCs. The starting time, the number of intervals over which performance monitoring is reported, and the parameter is set by the user. Table 8-3 lists the valid parameters and explanation:

**Table 8-3. Valid Parameters**

| Parameter | Explanation                           |
|-----------|---------------------------------------|
| CVP       | Path Coding Violations                |
| CVL       | Line Coding Violations                |
| ESP       | Path Errored Seconds                  |
| ESL       | Line Errored Seconds                  |
| SESP      | Path Severely Errored Seconds         |
| SESL      | Line Severely Errored Seconds         |
| SESF      | Path Severely Errored Framing Seconds |
| CSSP      | Path Controlled Slip Seconds          |
| UASP      | Path Unavailable Seconds              |
| ALLPAR    | All listed parameters                 |

## **Performance Monitoring Data**

---

### **Overview**

DACS II provides a command to check DS1 performance monitoring data for DA and TA type NPCs. When the user wants to view the parameter counts for all NPCs only one performance parameter may be queried. If the value ALLPAR 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.

---

---

## Performance Monitoring Counts

---

### Overview

The user has the ability to clear facility performance monitoring parameters for DA and TA 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.

---

### Monitored Parameter

The monitored parameter accumulation register to be reset must be listed in Table 8-4:

**Table 8-4. Monitored Parameters**

---

| Parameter | Explanation                           |
|-----------|---------------------------------------|
| CVP       | Path Coding Violations                |
| CVL       | Line Coding Violations                |
| ESP       | Path Errored Seconds                  |
| ESL       | Line Errored Seconds                  |
| SESP      | Path Severely Errored Seconds         |
| SESL      | Line Severely Errored Seconds         |
| SESF      | Path Severely Errored Framing Seconds |
| CSSP      | Path Controlled Slip Seconds          |
| UASP      | Path Unavailable Seconds              |
| ALLPAR    | All listed parameters                 |

---

---

## Hybrid DS3 Line Performance

---

### Overview

The following Hybrid DS3 line performance parameters are monitored by DACS II:

- Code Violations for the DS3 line (CVL)
- Errored Seconds for the DS3 line (ESL)
- Severely Errored Seconds for the DS3 line (SESL).

**NOTE:**

A Hybrid DS3 line may carry 28 DS1s or 21 E1s or a mixture of DS1s and E1s. Please remember that DS3 Line and Path performance parameters are only supported by Hybrid DS3Us. A Hybrid DS3 can consist completely of DS1s for the purpose of collecting performance monitoring data.

---

### Code Violations

Code Violations for the DS3 line (CVL) provide a count of the sum of Bipolar Violations (BPVs), occurrence of a same polarity pulse as the previous pulse after the B3ZS zero code suppression is taken into account and Excessive Zeroes (EXZs), any zero string of length equal to or greater than 3 before the B3ZS zero code suppression is taken into account.

---

### Errored Seconds

Errored Seconds for the DS3 line (ESL) is a count of the seconds that contain one or more BPVs and EXZs or one or more LOS defects.

---

### Severely Errored Seconds

Severely Errored Seconds for the DS3 line (SESL) is a count of the seconds that contain more than 44 BPVs and EXZs or one or more LOS defects. SESL is a subset of ESL.

---

---

## Hybrid DS3 Path Performance

---

**Overview** The following Hybrid DS3 path performance parameters are monitored by DACS II:

- Code Violations for the DS3 path (CVP)
- F- and M-bit Errors for the DS3 path (FMP)
- Errored Seconds for the DS3 path (ESP)
- Severely Errored Seconds for the DS3 path (SESP)
- Far End Severely Errored Seconds for the DS3 path (FSESP)
- Unavailable Seconds (UASP).

---

**Code Violations** Code Violations for the DS3 path (CVP) is a count of the P-bit parity errors.

---

**F-bit and M-bit Errors** F- bit and M-bit Errors for the DS3 path (FMP) is a count of F- and M-bit errors.

---

**Errored Seconds** Errored Seconds for the DS3 path (ESP) is a count of seconds containing one or more F- or M-bit errors, one or more OOF defects, or one or more AIS defects.

---

**Severely Errored Seconds** Severely Errored Seconds for the DS3 path (SESP) is a count of the seconds that contain more than 44 F- or M-bit errors, or one or more OOF defects, or one or more AIS defects. SESP is a subset of ESP.

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(Continued on next page)



## Hybrid DS3 Path Performance (Continued)

### Far End Severely Errored Seconds

Far End Severely Errored Seconds for the DS3 path (FSESP) provides a count of seconds when the X-bits are received as being in Remote Alarm.

### Unavailable Seconds

Unavailable Seconds (UASP) provides a count of seconds during which the path is unavailable. The DS3 path is unavailable if the DS3 line is unavailable. Figure 8-1 provides the location of the DS3 lines and path structure.

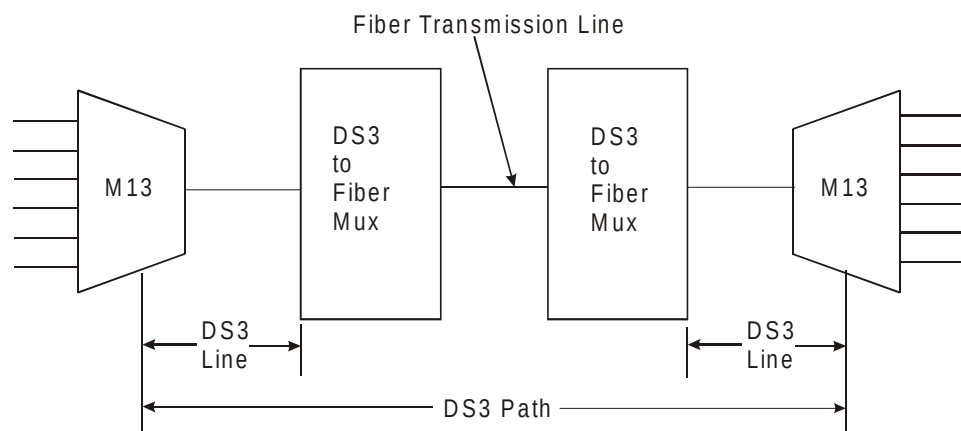


**Figure 8-1. Hybrid DS3 Line and Path Structure**

---

## Hybrid DS3 Daily Facility Alarm Reporting Time

---

**Overview**                      The start of every four 15-minute intervals is aligned with the hour boundary. The daily interval starts at midnight, or at the time specified by the user referred to as "local midnight." The daily interval ends 24 hours later. The following can be set by the user:

---

**Time-of-Day**                      The start of the 15-min and daily count intervals is accurate to within +/- 30 seconds with respect to the DACS II time-of-day. If the time-of-day is changed, all counts saved in previous and subsequent 15-min and daily registers will be unaffected. The registers will continue to count uninterrupted and the current interval timer shall be changed to the new time.

Additionally, a facility alarms report is output daily at the local midnight time. Local midnight is set by specifying the time of day and the parameters to report.

---

## Hybrid DS3 Performance Monitoring Data

---

### Overview

DACS II provides commands used to check and clear performance monitoring data for Hybrid DS3 facilities provisioned on KCR8 circuit packs. The user can perform the following:

- Retrieve current and/or historical performance monitoring data
  - Clear the 15-minute or daily performance monitoring counts.
-

---

## Threshold Support for Hybrid DS3 PM Feature

---

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>                     | <p>This feature adds threshold support to the performance monitoring feature for Hybrid DS3 circuits. The threshold support feature is capable of:</p> <ul style="list-style-type: none"><li>■ Setting up four separate threshold values including the default threshold value for each performance monitoring parameter</li><li>■ Detecting threshold crossings for each of the daily and 15-minute parameters</li><li>■ Issuing a threshold crossing message when a threshold crossing occurs.</li></ul> <hr/>                                                                                                  |
| <b>Threshold Values</b>             | <p>Threshold values are set at the time the HMXR and its associated DS3 facilities are grown by selecting a values for <b>&lt;rr&gt;</b> (Table 8-5) and <b>m</b>.</p> <p>The value for <b>&lt;rr&gt;</b> (101 through 109 for DAILY counts, 111 through 119 for 15-MINUTE counts) defines the performance parameter and collection interval.</p> <p>The value for <b>m</b> (0 through 3) determines which of the four threshold values set for the performance parameter will be used for Threshold Crossing. If a value of 0 is selected for <b>m</b>, then the default threshold value will be used.</p> <hr/> |
| <b>Threshold Crossing Messages</b>  | <p>When the parameter counts reach or exceed their respective threshold value, then the event is known as "Threshold Crossing." Once a threshold crossing has occurred, a corresponding threshold crossing message is displayed at the DACS II terminal. The message identifies the particular performance parameter, current threshold value, and the current parameter count.</p> <p>Threshold crossing messages behave similarly to informational alarm messages, however, threshold crossing messages do not have idle messages.</p> <hr/>                                                                    |
| <b>Limit on Threshold Crossings</b> | <p>Within any interval count (15-MINUTE or DAILY), there will be no more than one threshold crossing per interval per performance parameter.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Threshold Support for Hybrid DS3 PM Feature (Continued)

### Setting Threshold Values

Users can initialize and/or change up to three threshold values for each parameter. There is also a default threshold value set for each parameter. Table 8-5 provides a listing of the performance parameters and the associated default value and threshold range for each performance parameter.

**Table 8-5. Threshold Values**

| <b>PM Parameter</b> | <b>"&lt;rr&gt;" value<br/>used in<br/>commands</b> | <b>Range of<br/>Threshold</b> | <b>Default Threshold</b> |
|---------------------|----------------------------------------------------|-------------------------------|--------------------------|
| CVL - Daily         | 101                                                | 0 to 1,073,700,000            | 3,867,523                |
| ESL - Daily         | 102                                                | 0 to 86,400                   | 4,320                    |
| SESL - Daily        | 103                                                | 0 to 86,400                   | 90                       |
| CVP - Daily         | 104                                                | 0 to 353,870,000              | 3,867,523                |
| FMP - Daily         | 105                                                | 0 to 22,096,800               | 176,947                  |
| ESP - Daily         | 106                                                | 0 to 86,400                   | 4,320                    |
| SESP - Daily        | 107                                                | 0 to 86,400                   | 90                       |
| FSESP - Daily       | 108                                                | 0 to 86,400                   | 90                       |
| UASP - Daily        | 109                                                | 0 to 86,400                   | 0                        |
| CVL - 15min         | 111                                                | 0 to 29,490,750               | 402,867                  |
| ESL - 15min         | 112                                                | 0 to 900                      | 300                      |
| SESL - 15min        | 113                                                | 0 to 900                      | 30                       |
| CVP - 15min         | 114                                                | 0 to 3,686,175                | 402,867                  |
| FMP - 15min         | 115                                                | 0 to 230,175                  | 18,432                   |
| ESP - 15min         | 116                                                | 0 to 900                      | 300                      |
| SESP - 15min        | 117                                                | 0 to 900                      | 30                       |
| FSESP - 15min       | 118                                                | 0 to 900                      | 30                       |
| UASP - 15min        | 119                                                | 0 to 900                      | 0                        |

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## Threshold Support for Hybrid DS3 PM Feature (Continued)

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### Suppressing Threshold Crossing Messages

Threshold Crossings and their associated alarm messages can be suppressed (turned off) by:

1. Setting the value of one of the 3 user selected threshold values to 0
2. Selecting that threshold value (using the **m** variable) for the threshold crossing.

In an effort to minimize repetitive alarm messages, the default value for the Unavailable Seconds (UASP) parameter is 0.

---

## Facility Test Signals

### Overview

DACS II provides the following "command and leave" test signals:

- Yellow Signal
- High Density Test Signal
- Low Density Test Signal
- Quasi-Random Test Signal
- In-Band Loopback Activate Signal
- In-Band Loopback Deactivate Signal
- Loopback Retention Signal.

These signals support network maintenance activities.

### Activate Facility Test Signals

A user can activate a facility test signal by entering a DACS II command. Table 8-6 lists the test signal types and explanation:

**Table 8-6. Test Signal Types for Activation**

| test | Explanation                        |
|------|------------------------------------|
| YELT | Yellow test signal                 |
| HDTS | High density test signal           |
| LDTS | Low density test signal            |
| QRTS | Quasi-random test signal           |
| ILBA | In-band loopback activate signal   |
| ILBD | In-band loopback deactivate signal |
| LRET | Loopback retention signal          |



**NOTE:**

The loopback retention signal is only applicable to NPCs grown with ESF framing.

## Facility Test Signals (Continued)

### Deactivate Facility Test Signals

A user may deactivate a facility test signal by using one of the following valid test signal types listed in Table 8-7:

**Table 8-7. Test Signal Types for Deactivation**

| test | Explanation                                                                                                                                                                                                                    |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALLP | All Payload Test Signals. Including high density test signal, low density test signal, quasi-random test signal, in-band loopback activate signal, in-band loopback deactivate signal, and yellow test signal in D4/T1DM mode. |
| ALLD | All Data Link Test Signals. Including yellow test signal in ESF mode, loopback retention signal, and ANSI bit-oriented far-end loopback activate/deactivate sequences.                                                         |
| ALL  | All Test Signals in both the payload and data link                                                                                                                                                                             |



## Facility Loopback

---

### Overview

DACS II executes a near-end (at the DACS II) payload loopback by transmitting the received information bits of each frame back onto the DS1 facility. The framing bit position is regenerated by DACS II during a payload loopback. DACS II also sends payload, line, and network loopback commands on the ESF data link to far-end (at the terminal on the other end of the DS1 facility) equipment, ordering the equipment on the other end of the DS1 facility to execute the respective loopbacks.

**NOTE:**

The commands used for facility loopback are valid for all DS1s except for those DS1s embedded within a Hybrid DS3 signal.

---

### Activate/ Deactivate a Facility Loopback

The user may activate or deactivate a facility loopback. The valid loopback types are listed below:

| loop | Explanation |
|------|-------------|
| LINE | Line        |
| PYLD | Payload     |
| NTWK | Network     |

**NOTE:**

LINE and NTWK loopbacks are only applicable to FEND. Commands to activate/deactivate LINE/NTWK LPBK with NEND will be denied.

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## Facility Loopback for TE or TH Type NPC within a Hybrid DS3

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### Overview

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.

---

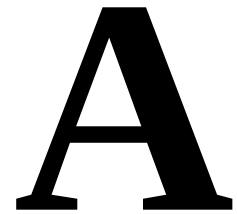
### Activate/ Deactivate a Facility Loopback

The user may activate/deactivate a facility loopback. Only LINE is allowed for TE or TH type NPCs associated with a Hybrid DS3 signal when activating or deactivating.

---

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# Command Denials



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## Contents

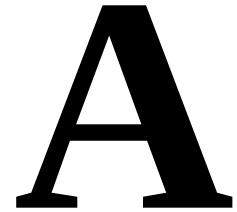
|                                |                     |
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## Command Denials



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### Background

#### Introduction

DACS II will respond with a command denial message when an incorrect command is entered, there is trouble in the system (either software or hardware), or when an operator enters a command which has been restricted by the system administrator.

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#### Objective

This chapter provides information to recognize clear command denials.

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## Clear Command Denials

### Overview

When a user inputs an invalid command, the DACS II system denies the command and displays a denial message. The two types of denial messages are:

- Frame Denial Message
- Hexadecimal Condition Code Message.

### Denial Message Command Strings

DACS II responds with a word strings in the denial message after a command is entered incorrectly or equipment is not operating properly. The following table provides the word string and the corrective action required to obtain command completion

| Word String                | Corrective Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INACT</b>               | The INACT message indicates that the command is invalid with the feature package being used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>BAD SYNTAX</b>          | 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, ?)<br><br> <b>NOTE:</b><br>The DACS II indicates where the input error occurred, by placing = signs around the word or portion in the echoed command. |
| <b>ERR, ABT</b>            | 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                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>MC OOS</b>              | The MC (main controller) must be restored to service to execute the command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MCOND</b>               | The MC is in the maintenance condition, and only commands which are considered frame maintenance commands can be used                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>MC INSERVICE</b>        | The MC must be in the maintenance condition to execute certain PMEM and SMEM commands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>MPDBASE</b>             | The main processor data base is not loaded                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>RESTRICTED, STOPPED</b> | 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 SET-PRVG command with option RMON for the user                                                                                                                                                                                                                                                                                                                                          |

## **Clear Command Denials (Continued)**

### **Subrate Denial Message**

The following table provides the corrective action required for a subrate data denial message string:

| <b>Message String</b>                          | <b>Corrective Action</b>                                                                                                                                                                                     |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exceeds Limit of 21                            | Only 21 MJUs can be disconnected at one time. Split the MJUs to be disconnected into smaller groups                                                                                                          |
| INCL Required for All Subrate Circuits         | This is a precaution to ensure that data customers are informed of maintenance action. Verify that you are addressing the correct channel and notify customers if you are going to remove service            |
| OLD Channel Not Established to Subrate Feature | The addressed channel has not been established to subrate with command established to subrate with CRTE-CRS-TS command                                                                                       |
| OLD Channel Has Associated Parity Channel      | The PCH [ppp] option must be used to indicate the next or particular parity channel                                                                                                                          |
| New Channel Not Same As Old                    | The new channel was established to Subrate differently (DS0A or DS0B). Check channel entries                                                                                                                 |
| Exceeds EC/SRM/MJU Capacity                    | For EC, use ECLOC query to find which is being used (SRM or MJU); enter command to change ECLOC. For SRM/MJU, the next plug-in is required for more capacity                                                 |
| MPTM Keyword Disallowed                        | The MPTB keyword is only valid for multipoint junction unit circuit                                                                                                                                          |
| MA Field Does Not Exist                        | The MJU entered in the MA field does not exist                                                                                                                                                               |
| ALL Keyword Is Not Specified                   | The ALL must be used when there are branches. Verify command entry                                                                                                                                           |
| Associated with RT Digroups                    | An NPC entered in the command is associated with <i>SLC</i> Carrier System; channels for these are entered as virtual channels on the DGA NPC, which allows channels 1 through 96 to be addressed on one NPC |

## **Clear Command Denials (Continued)**

### **Common Causes**

Command denials can be categorized under common causes. The following table provides the denial descriptions and corrective action required to obtain command completion:

| <b>Command Denial</b>                          | <b>Corrective Action</b>                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input Error</b>                             | Check each field of the command entry on the screen or printout against the documented command to find the error                                                                                                                                                                                                                         |
| <b>Not Equipped, Not In-Service, or Failed</b> | The named equipment is not grown (equipped) or in-service to support the execution of the command. The commands to create 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.                                   |
| <b>Incorrect NPC/<br/>Channel Number</b>       | 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                                                                                         |
| <b>Invalid Parameters</b>                      | Check each field of the command entry against the documented command to determine which keyword is incorrectly used                                                                                                                                                                                                                      |
| <b>Boot Failed</b>                             | 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 |



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## **Clear Command Denials (Continued)**

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### **DENY Output Message**

The Deny output message provides a 4-digit error code which appears on a line by itself and the remaining lines which give the explanation of the error code. Table A-1 provides the error codes.

Error codes starting with the same letter are in the same general category; for example, I for input, E for equipage, S for service. The code is taken from letters of the key words that constitute the meaning of the code.

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(Continued on next page)

**Table A-1. mmmm Condition Codes**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENEQ       | CCB not eqd, not IS, or failed or inactive side CCB not eqd or not IS<br>CPR is not equipped<br>Copy source NPC is not equipped<br>DSPI not equipped, not in service, or failed<br>DSPU is not equipped<br>Database corrupt<br>ETSI not equipped, not in service, or failed<br>FC not eqd, not IS, or failed or inactive side FC not eqd or not IS<br>FMT not eqd, not IS, or failed, or inact side FMT not eqd, or not IS<br>FTMI not equipped, not in service, or failed<br>MIU is not equipped<br>Mate NPC is not equipped<br>NPC not equipped<br>NPC not provisioned as DGA<br>NPCTG not grown<br>NPCTP is not grown<br>No CBTYPE NPC equipped<br>No DSP unit equipped<br>Not enough DSPPs are equipped<br>Protection MIU is not equipped<br>Protection entity is unequipped<br>Required FLI not equipped, not in service, or failed<br>Required MIU not equipped, not in service, or failed<br>Required MXR not equipped, not in service, or failed<br>SYNC TB is not equipped<br>Service MXR is not equipped<br>Subject entity is not equipped<br>Sync source NPC is not equipped<br>TSI not eqd, not IS, or failed or inactive side TSI not eqd or not IS<br>The MXR is not grown<br>The pair MXR is not equipped<br>Unit not equipped, not in service, or failed<br>Test group unequipped<br>Virtual SLC NPC not provisioned |
| ENFE       | Cross-connect not consistent with feature package<br>Software does not contain Enhanced CEPT feature<br>Subject NPC does not support CEPT BER feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ENIE       | Option rr/m has not been set up on 2nd database<br>Termination is not connected as indicated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ENRE       | Two confs. were prev. connected or the concat. cause BRD-BBL loop<br>Corresponding NPC for FROM virtual channel is not provisioned<br>Corresponding NPC for TO virtual channel is not provisioned<br>Corresponding NPC for virtual channel is not provisioned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | FROM NPC is not provisioned as DGA                                |
|            | Illegal connectivity specified                                    |
|            | NPC not provisioned for CAS                                       |
|            | NPC not provisioned for NSA                                       |
|            | PMEM type no longer supported                                     |
|            | SMEM is a normal SMEM                                             |
|            | SSC circuit pack is still equipped; pull-out/remove SSC           |
|            | Subject entity is equipped                                        |
|            | TO NPC is not provisioned as DGA                                  |
| ERLC       | Attempt to remove DGA w/o INCL keyword or prior prot. sw. request |
|            | Customer control or red circuit exists                            |
|            | DGA protected; use INCL to remove, or unswitch protection         |
| ICNV       | PM scheduling report is already allowed for this entity           |
|            | PM scheduling report is already inhibited for this entity         |
|            | TS0 is crossconnected to TS0                                      |
|            | Bit value not allowed for NPC type                                |
|            | Current error corrector pack type specified in command            |
|            | Current Hub id specified in command                               |
|            | not allowed for clear 2MB                                         |
| IDMS       | Both FAC and PRIM values(keywords) are required                   |
|            | INCL keyword needed to perform this command                       |
|            | INCL must be specified for SRDC ckts                              |
|            | SIDE must be specified for substrate NPC                          |
|            | Some priority values required                                     |
|            | Unspecified L2 address                                            |
| IDNC       | FDL selected with width not 1                                     |
|            | Inconsistent or invalid circuit type for Nx64Kbit TA              |
|            | Old or new is a non-channelized type in a DS0 command             |
|            | One NPC is a non-channelized type and the other is not            |
|            | Some priority values not required                                 |
|            | TG width incompatible with circuit                                |
|            | The two FADS entered are not associated with one another.         |
|            | Incompatible HUB feature types                                    |
|            | Inconsistent BCON width for test access                           |
|            | Inconsistent HUB width for specified TG                           |
|            | Invalid channel designation for BCON                              |
|            | Not all FROM channels on same NPC                                 |
| IDNV       | A locally switched channel is specified as BBL, LEG, or BRD       |
|            | A substrate circuit pack is specified in the command line         |
|            | AIS entered for MONE/MONF/MONEF/SPLTA/SPLTB/SPLTAB                |
|            | AIS invalid for cross-connection specified                        |
|            | AIS keyword incompatible with NPC type                            |
|            | Adding two digroups from one bank on same DDC                     |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                    |
|------------|-----------------------------------------------------------------------|
|            | Alarm option and bank mode don't match                                |
|            | All NPC(s) are either not valid or not grown                          |
|            | Attempt to broadcast a locally switched channel                       |
|            | Attempt to one way cross-connect a locally switched channel           |
|            | BER must not be less than 4 for Clear DS1                             |
|            | Bad PRIM X'efgh values                                                |
|            | Bank id number not found                                              |
|            | CPR circuit pack specified in the command                             |
|            | Can't Use LCN 0/LGN 0 - designated as a supervisory channel only      |
|            | Can't delete because not all associated NPCs of the RT are entered    |
|            | Command not allowed                                                   |
|            | Conference first channel doesn't match input                          |
|            | Conference port cannot be dropped out of conference by switch command |
|            | Conference port is not in conference circuit                          |
|            | Connectivity can not be specified for CEF unit                        |
|            | Counting sequence and operational mode don't match                    |
|            | Cross-connect a non Mode I channel to DCLU                            |
|            | Cross-connect a non SLC channel to DCLU                               |
|            | DGA and DGB must be specified together in the command                 |
|            | DGA with NDL option is not provisioned with D4 or ESF framing format  |
|            | DGA/DGP of RT/DL Mode I must be assigned to one DDC                   |
|            | DGC and DGD must be specified together in the command                 |
|            | DGP designated to bank without data link                              |
|            | Digroup name and bank id don't match                                  |
|            | Digroups from same bank are added to two different FTUs               |
|            | Digroups from same bank have different counting sequence              |
|            | Digroups from same bank have different modes                          |
|            | Duplicate L2 address                                                  |
|            | Duplicate ports specified                                             |
|            | ENQ/ACK flow control is supported only on Snider link                 |
|            | Error in input                                                        |
|            | Framing format, digroup name & operational mode don't match           |
|            | INCL not specified and at least one NPC In Service                    |
|            | IU type NPC(s) cannot be provisioned for Minor Alarm                  |
|            | IW option is not allowed for new type of Clear-DS1 NPC                |
|            | Inconsistent Signaling on CEPT NPCTGs                                 |
|            | Inconsistent channel range width                                      |
|            | Invalid CEPT NPC                                                      |
|            | Invalid CFT code                                                      |
|            | Invalid FPI value                                                     |
|            | Invalid FROM channel number                                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Invalid MIU/MXR type specified                                      |
|            | Invalid NPC addressing scheme specified                             |
|            | Invalid SLC Mode-III channel number                                 |
|            | Invalid TC specification                                            |
|            | Invalid TO channel number                                           |
|            | Invalid channel 000 cross-connection specified                      |
|            | Invalid channel 031 cross-connection specified                      |
|            | Invalid channel number                                              |
|            | Invalid circuit type                                                |
|            | Invalid keyword(s) combination specified                            |
|            | Invalid line number                                                 |
|            | Invalid link number specified                                       |
|            | Invalid poll time                                                   |
|            | Invalid switch request for DCLU                                     |
|            | Leg type mismatch                                                   |
|            | MUX or TRB invalid for cross-connection specified                   |
|            | Mode I RT/DL IDs don't match for DGA/DGP on same DDC                |
|            | NAM invalid for cross-connection specified                          |
|            | NDL option is specified for DGA                                     |
|            | NDL option is used without DGA                                      |
|            | NPC containing channel 000 is invalid type.                         |
|            | NPC is a DGP                                                        |
|            | NPC is channelized type                                             |
|            | NPC is not part of a one-way connection                             |
|            | NPC number and bank id don't match                                  |
|            | NPC number and digroup name don't match                             |
|            | NPC parameter only valid with TU type TLI                           |
|            | NPC type is not DS type                                             |
|            | NPC type option Y is invalid for SLC-96 NPC                         |
|            | NPC used as a timing reference                                      |
|            | NPC(s) actual type incompatible with TYPE keyword and/or alarm type |
|            | No OOS keyword is given for out-of-service NPC                      |
|            | No PM data available                                                |
|            | No mapped circuit under test; emode/fmode can't be changed.         |
|            | Number of transmitting ports does not match existing conference     |
|            | OLD and NEW Data and Parity channels partially overlap              |
|            | OLD and NEW channels cannot be the same                             |
|            | OLD data channel cannot be parity channel type                      |
|            | Old and new are the same NPC in a DS1 command                       |
|            | One-way circuit under test; emode can't be changed.                 |
|            | Operation mode and digroup name don't match                         |
|            | Option not programmable for this NPC type                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b>  | <i>Explanation</i>                                                     |
|-------------|------------------------------------------------------------------------|
|             | PWR/MISC alarm is specified to a digroup other than DGA                |
|             | Parameter only valid with PA, PB, or PC type NPCs                      |
|             | RT-DCLU cross-connect with different channel number                    |
|             | RT-DCLU cross-connect with different ids                               |
|             | RTF keyword and the operation mode does not match                      |
|             | RTF keyword is used without DGA                                        |
|             | Range entered without FRC keyword                                      |
|             | Range not allowed for circuit type                                     |
|             | SC invalid for cross-connection specified                              |
|             | Selectable AIS not valid for specified NPC(s) type                     |
|             | Side specified for non-duplicated NPC                                  |
|             | Signaling processing is not activated for the channel                  |
|             | Superuser logged on                                                    |
|             | TG East/West type inconsistent with each other or circuit              |
|             | TS0 specified with width not 1                                         |
|             | TS16 specified for CAS TG                                              |
|             | TS16 specified for test with width not 1                               |
|             | The RT id entered is not a retrofit one                                |
|             | The common bit(s) is(are) not set in both FAC & PRIM                   |
|             | The facility parameter not programmable for specified x or z parameter |
|             | The parameter specified does not match with the NPC type               |
|             | The specified parameter is not applicable to operation mode of the RT  |
|             | Trunk type is not allowed in the circuit specified                     |
|             | Unmatched channel range                                                |
|             | Unmatched channel range involving SLC Mode III termination             |
|             | Unrunnable CFT code                                                    |
|             | Using the 24th channel of a DMI NPC                                    |
|             | Using the 24th channel of a T1DM NPC                                   |
|             | Virtual circuit is not specified for X.25 link                         |
|             | XON/XOFF flow control is supported only on Snider link                 |
|             | ZBTSI option is only valid with the ESF mode                           |
|             | Emode/fmode can't be changed under current test mode.                  |
|             | x & z parameters on DSxyz are inconsistent                             |
| <b>IDRG</b> | Command did not execute for any entity specified in the command        |
|             | Ending channel is out of range                                         |
|             | First and Last NPCs are outside a module boundary                      |
|             | First and Last NPCs are outside unit boundary                          |
|             | Invalid FROM channel number range                                      |
|             | Invalid TO channel number range                                        |
|             | Invalid range for specified FROM NPC type                              |
|             | Invalid range for specified NPC type                                   |
|             | Invalid range for specified TO NPC type                                |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | NPC range crosses unit boundary                                      |
|            | OFFSET range is invalid                                              |
|            | Old and New channel on same NPC and within the range                 |
|            | Only up to 4 historical data registers are allowed                   |
|            | TG width too large for single NPCTG                                  |
|            | Threshold value is out of range                                      |
|            | Unit type (xyz) not supported                                        |
|            | input channel out of range (SLC not supported)                       |
| IICM       | Clear gateway test access disallowed.                                |
|            | SRDC timeslots are allocated on this NPC                             |
| IIDT       | AIS not entered for SPLTE/SPLTF/SPLTEF/LOOPE/LOOPF                   |
|            | Database conference width does not match the range in input command  |
|            | Illegal BBL BBL combination                                          |
|            | Illegal BBL SYM combination                                          |
|            | Illegal BRD BRD combination                                          |
|            | Illegal BRD SYM combination                                          |
|            | Illegal LEG LEG combination                                          |
|            | Illegal SYM BBL combination                                          |
|            | Illegal SYM BRD combination                                          |
|            | Invalid change from previous mode                                    |
|            | Invalid change parameter combinations                                |
|            | Invalid input BBL as fmd in ONE-WAY command                          |
|            | Invalid input BBL in terminated TWOWAY/ONEWAY command                |
|            | Invalid input BRD as tmd in ONE-WAY command                          |
|            | Invalid test mode for a one-way test session                         |
|            | Invalid test mode for an unmapped test session                       |
|            | Invalid use of CONV keyword                                          |
|            | NPC is a channelized NPC                                             |
|            | NPC is a non-channelized NPC                                         |
|            | NPC is not a F-end                                                   |
|            | NPC is not a Facility Access Digroup                                 |
|            | NPC is not an E-end                                                  |
|            | NPC type mismatch                                                    |
|            | No NPC's out of service and OOS keyword used                         |
|            | No RDLT or CUS circuits and INCL keyword used                        |
|            | Report interval is not an integral number of accumulation interval   |
|            | TO side is not a DMB type NPC                                        |
|            | This NPC type does not allow unframed Clear-DS1                      |
|            | Transmission parameters in command will not change existing settings |
|            | Trunk conditioning is invalid                                        |
| IIFM       | Bad FAC value entered                                                |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | Exceeded depth limit of 6 on broadcast conference concatenation   |
|            | FMC cannot be cross-connected in this format                      |
|            | Invalid FROM NPC type for AIS insertion                           |
|            | Invalid NPC type for AIS insertion                                |
|            | Invalid TO NPC type for AIS insertion                             |
|            | Try to operate a ONE-WAY conference with a TWO-WAY input command  |
|            | Try to operate a TWO-WAY conference with an ONE-WAY input command |
| IPNV       | Accumulation Interval field is missing                            |
|            | Accumulation Interval field is not allowed                        |
|            | FAC keyword is invalid for this feature                           |
|            | Historical data can not be specified                              |
|            | Interval is not valid/not available                               |
|            | Invalid direction specified for NTST TLA/TLR                      |
|            | Invalid parameter combination                                     |
|            | Invalid use of INCL keyword                                       |
|            | Level field is not allowed                                        |
|            | MONDAT keyword is invalid for this feature                        |
|            | MONDAT set to ALL is not allowed                                  |
|            | MONTIM set to ALL is not allowed                                  |
|            | Mismatch between channel 0 crossconnect and keywords              |
|            | Monitored Date field is not allowed                               |
|            | Monitored Time field is not allowed                               |
|            | NPC is non-channelized                                            |
|            | NPC number out of range                                           |
|            | No PM data available                                              |
|            | Only 15MIN for accumulation interval is allowed                   |
|            | Only DAILY for accumulation interval is allowed                   |
|            | Only historical data can be specified                             |
|            | Only one parameter is allowed                                     |
|            | PRIM keyword is invalid for this feature                          |
|            | Scheduled reporting for this npc is inhibited                     |
|            | Scheduling report could not be found                              |
|            | The MONDAT and MONTIM parameters can not both be specified        |
|            | This NPC type does not allow Payload                              |
| NCON       | No conditions                                                     |
| SAAL       | Feature is active                                                 |
|            | Manual Pending is Active                                          |
|            | PA NPC threshold already in allow mode                            |
|            | Protection switching is already allowed                           |
|            | The switch is allowed (not inhibited)                             |
| SAAS       | All channels assigned, cannot be grown as NPCTG                   |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Another NPC is grown and added as this digroup                      |
|            | BCON BBL has one or more legs under test                            |
|            | Channel(s) is already registered                                    |
|            | Channels assigned, cannot be grown as test group                    |
|            | Channels assigned, cannot be grown as test port                     |
|            | Conference Port is currently registered to a different channel      |
|            | New bank id is an assigned one                                      |
|            | TG number previously assigned                                       |
|            | Termination is already assigned                                     |
|            | Termination is in process of being rolled                           |
|            | The MIU is already equipped                                         |
|            | Channel already under test                                          |
|            | Channel part of a TP or TG                                          |
|            | Circuit contains mapped channels for HUB request                    |
| SAIN       | Loop back inhibited for digroup                                     |
|            | No mapped slots on a tsi                                            |
|            | No unmapped slots on a bus                                          |
|            | PA NPC threshold already in inhibit mode                            |
|            | Parity channel cannot be within the range of a DS0 command.         |
|            | Protection switching is already inhibited                           |
|            | Subject entity is pested                                            |
|            | Termination is under test or is a test port or group                |
|            | The switch is already inhibited                                     |
|            | Can't change option, inhibition is active                           |
| SAIS       | Both syncs are in-service                                           |
|            | CCN side s is in service                                            |
|            | CRO is still equipped                                               |
|            | Conference already exists                                           |
|            | DS3U NPC already In-Service                                         |
|            | DSPI is in service                                                  |
|            | MIU is already in service                                           |
|            | Mate NPC (DGA/DGP) is in service                                    |
|            | NPC not IU/TI type                                                  |
|            | Some TLIs are still equipped                                        |
|            | Some TSIs to degrow are in service                                  |
|            | Subject entity is in service                                        |
|            | TLI 3 or 4 still equipped                                           |
|            | Test group is not idle or frame is not In Service                   |
|            | Test port is not idle or frame is not inservice                     |
|            | The MMFG is already In-Service                                      |
|            | The MXR is in service                                               |
|            | The selected FLI is IS and Pested and at least 1 Service MXR is eqd |
| SAOP       | RT's alarm exists                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                             |
|------------|----------------------------------------------------------------|
| SAOS       | This signal is already being sent                              |
|            | A DMB on the Unit is OOS                                       |
|            | Both syncs are out-of-service                                  |
|            | CCB is out of service                                          |
|            | CCI is out of service                                          |
|            | CCN side s is out of service                                   |
|            | CCNI is out of service                                         |
|            | DSPI out-of-service                                            |
|            | ETSI is out of service                                         |
|            | FC out of service                                              |
|            | FLI is out of service                                          |
|            | FMT is out of service                                          |
|            | FTMI is out of service                                         |
|            | File has already been cleared                                  |
|            | Formatter (FMT) on active CCN side is Out-Of-Service           |
|            | IU/TI type NPC failed                                          |
|            | MIU is out of service                                          |
|            | MXR is out of service                                          |
|            | Mate CCN side is out of service                                |
|            | Mate SYNC is out of service                                    |
|            | NPC out of service or failed                                   |
|            | Protection MIU is out of service                               |
|            | Protection MXR is out of service                               |
|            | Protection entity out of service or failed                     |
|            | SYNC is out of service                                         |
|            | Service MIU is out of service                                  |
|            | Service MXR is out of service                                  |
|            | Subject entity is out of service                               |
|            | Sync 0 is not in-service                                       |
|            | Sync 1 is not in-service                                       |
|            | The MMFG is Out Of Service                                     |
|            | The mate FLI is OOS and Protection MIU is equipped             |
|            | The mate FLI is OOS and Protection MXR is IS                   |
|            | The mate FLI is OOS and at least one Service MXR is equipped   |
|            | The protection FLI is out of service or pested (TOPRTN option) |
|            | The selected MIU associated with the NPC is Out-Of-Service     |
|            | The selected MXR associated with the NPC is Out-Of-Service     |
|            | The service FLI is out of service or pested (TOSRVC option)    |
|            | UC is out of service                                           |
| SAPS       | Frame ID is protected                                          |
|            | The Service MMFG is already under protection                   |
|            | The protection FLI is already selected (TOPRTN option)         |
|            | Can't change option, protection switch is active               |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SAPV       | Option LOCAL already exists<br>Option REMOTE already exists                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SARB       | Exceeded limit of reports with accum. interval of 15 min. or less<br>Exceeded maximum limit of PM reports                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SARL       | No FADs were activated by link n<br>No test ports were activated by link n                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SATF       | Can't run test on active side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SAWS       | An autonomous switch is in progress<br>C-bit modify function is active<br>C-bit operations are enabled<br>Conference exists in a DMB<br>Mapped slots exist on a tsi<br>NPC already allocated as sync timing source<br>NPC already grown as non-synchronization source<br>NPC already has Equipment Loopback<br>NPC is already grown and added as SLC digroup<br>The Service MMFG is not under protection<br>The service FLI is already selected (TOSRVC option)                                                                        |
| SNAS       | Connectivity contains unequipped units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SNIS       | CPR is out of service<br>Cannot clear journals for OOS unit<br>DSPU unit controller is out of service<br>NPC is OOS for a TGR command and OOS keyword not specified<br>NPC unequipped, out of service or failed<br>RT/DL has unrestored DGA<br>Sync source NPC is not inservice<br>TD on one(both) sync(s) is not equipped or not in-service<br>Unit(s) OOS, and additional backup required                                                                                                                                            |
| SNOS       | In-service NPC change not allowed<br>Subject PWR to be cleared is not failed                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| SNVS       | (Timing Distributor) TLI is not equipped<br>1 hr >= 24 hr for DM opt<br>15 min >= 24 hr for ERS opt<br>15 min >= 24 hr for SERS opt<br>15 min >= 24 hr for SLIP opt<br>15 min >= 24 hr for US opt<br>3 Timing Distributor type TLIs are equipped<br>A DMB mode was assigned to a FTU-type NPC on the input<br>A loopback is active on the FROM termination<br>A loopback is active on the TO termination<br>A user is already logged in on the link/vc<br>Active CCN side is out of service<br>Adding DL DGP forbidden for SLC 96 MD 1 |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Alarm bits cannot be passed through or inverted                      |
|            | All digroups not out of service                                      |
|            | Another signal already active prevents this signal from being sent   |
|            | Assignment of single priority to multiple SSPs                       |
|            | At least one UC is OOS or At least one UC is failed                  |
|            | At least one UC is not the correct type                              |
|            | Attempt to add to a null transmitting port                           |
|            | Attempt to remove a Service MIU which is under protection            |
|            | Attention: preceding ccode 83 is an anomaly - see problem list       |
|            | Autonomous loopback is active on DGA                                 |
|            | Backup required before executing this command                        |
|            | Bad sync mode                                                        |
|            | Bad use of INCL, cannot override the current state of the conference |
|            | Bad use of INCL, cannot use keyword on conf.-to-conf. connection     |
|            | Bit 3 provisioned for use as RAI3                                    |
|            | Bit 4 provisioned for use as RAIS                                    |
|            | Bit 4 provisioned for use as RBER                                    |
|            | Bit 5 provisioned for use as SFI                                     |
|            | Bit c not settable                                                   |
|            | Bits 3 through 8 are provisioned for Transmic 1G                     |
|            | Boot in progress, can't service request                              |
|            | Both ITS TG bundles must be on same TG193B card                      |
|            | Both sides of CCN are OOS                                            |
|            | Broadcast unassigned channel/NPC in QRY,TO                           |
|            | C-bit modify function is disabled                                    |
|            | CATP due to skipping continuity test for FMT                         |
|            | CCB is inservice but failed                                          |
|            | CCI is inservice but failed                                          |
|            | CCI is not present                                                   |
|            | CCNI is inservice but failed                                         |
|            | CPR in buffer overflow condition                                     |
|            | CRO type TLI (SSP portion not required)                              |
|            | CUS flag doesn't match that of conference                            |
|            | Can not create any more users                                        |
|            | Can not execute privileged command                                   |
|            | Can not perform DMB CHG on input direction A                         |
|            | Can not perform DMB CHG on input direction B                         |
|            | Can not perform DMB CHG on input direction F                         |
|            | Can not perform DMB CHG on input direction G                         |
|            | Can not perform DMB CHG on input direction L                         |
|            | Can not perform DMB CHG on input direction T                         |
|            | Can not remove Frame administrator                                   |
|            | Can not remove own link                                              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Can not use 12-th TP when NPCTP is in the T1DM or DMI mode          |
|            | Can't disconnect return leg unless entire conference disconnected   |
|            | Can't mount or unmount BOTH_MEM                                     |
|            | Can't mount or unmount PMEM                                         |
|            | Can't mount or unmount SMEM                                         |
|            | Can't mount or unmount password recovery card                       |
|            | Can't perform DMB CHG because NTR flag set on FROM side             |
|            | Can't perform DMB CHG because NTR flag set on TO side               |
|            | Can't RST MC CLR when a unit is equipped                            |
|            | Can't start new session - previous session still verifying          |
|            | Change not valid                                                    |
|            | Change to T1DM digroup with cross-connect that is not TRSP          |
|            | Change to non-ESF digroup with 16-state cross-connect               |
|            | Channel has a FAR, which is within the range                        |
|            | Channel or NPC not bridged                                          |
|            | Channel out of bound in a BCON/v.c                                  |
|            | Channels and conference port do not match                           |
|            | Clock absent for XPC to loop back                                   |
|            | Combination of bit g (b7) and h (b8) is invalid                     |
|            | Command and protocol are inconsistent                               |
|            | Command invalid while backup in progress                            |
|            | Command is Frame administrator (DAX) only.                          |
|            | Conference Port is already registered to the same group of channels |
|            | Conference is LPD: has no switchable return leg                     |
|            | Conference is NTR: has no switchable return leg                     |
|            | Conference port is currently connected                              |
|            | Conference port is not registered                                   |
|            | Conversion leg is terminated                                        |
|            | Cross-connect to CPR is required                                    |
|            | Customer controlled circuit, INCL not entered                       |
|            | DB MP or units ram error                                            |
|            | DB retrofit fail                                                    |
|            | DCTN conference channel cannot be rolled                            |
|            | DGA is not added                                                    |
|            | DGN on subject entity denied                                        |
|            | DGP is protecting a primary digroup                                 |
|            | DL ffff is used w/ operational mode other than Mode I               |
|            | DMI combined with T1DM                                              |
|            | DSPP not in service, or failed                                      |
|            | DSPP pack FTMI Failed or Out of Service                             |
|            | DSPP pack NPC Failed or Out of Service                              |
|            | DSPP pack UC Failed or Out of Service                               |
|            | Database is empty                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                 |
|------------|----------------------------------------------------------------------------------------------------|
|            | Database is not empty                                                                              |
|            | Database not loaded                                                                                |
|            | Delete or change a leg from a conference that has no leg                                           |
|            | Deny Clear-2MB for Alternate Maps                                                                  |
|            | Deny SLC for Alternate maps                                                                        |
|            | Deny SP Type NPCs for Alternate Maps                                                               |
|            | Deny non-channelized NPCs for Alternate Maps                                                       |
|            | Designated TG or circuit to be tested in process of being rolled                                   |
|            | Different DSxyz types are used for DGA/DGP on same DDC for Mode I                                  |
|            | Digroup is protected                                                                               |
|            | Disable not allowed - supports another feature                                                     |
|            | ETSI cannot be initialized when ECCN side is OOS or inservice but<br>pested                        |
|            | ETSI is inservice but failed                                                                       |
|            | ETSI is not present                                                                                |
|            | Entity can't be addressed in this configuration                                                    |
|            | FC is inservice but failed                                                                         |
|            | FLI is inservice but failed                                                                        |
|            | FMT is in service but failed                                                                       |
|            | FPI on SMEM does not match one on PMEM                                                             |
|            | FRC specified for protection, and service MMFG is In Service                                       |
|            | FROM is a two-way and no CONV specified                                                            |
|            | FROM is not a backbone leg                                                                         |
|            | FTMI is PESTED                                                                                     |
|            | FTMI is in service but failed                                                                      |
|            | FTMI type error                                                                                    |
|            | Feature deactivation would leave system with core software                                         |
|            | Feature not enabled                                                                                |
|            | File already exists                                                                                |
|            | File doesn't exist/can't be accessed                                                               |
|            | File is being accessed                                                                             |
|            | File is empty                                                                                      |
|            | Firmware timing invalid for Transmic 1G NPC                                                        |
|            | Flash Card is bad                                                                                  |
|            | Flash Card is empty                                                                                |
|            | Flash Card is not present                                                                          |
|            | Frame is not in MCOND                                                                              |
|            | Frame time is not set                                                                              |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Automatic CRC-4                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Firmware Timing                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Transmic 1G, 2G<br>G1 SMEM for SMEM->PMEM w/journals |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                             |
|------------|----------------------------------------------------------------|
|            | G4 to G4.1 retrofit failed                                     |
|            | Gateway test access not supported                              |
|            | Hardware mismatch or not present                               |
|            | INCL keyword needed when restricted Insertion Word specified   |
|            | IW is UMUX (18) but NPC not type DE4yz                         |
|            | IW not allowed to be specified in Clear 2Mbit/s                |
|            | Illegal SSP type (not same as other SSPs)                      |
|            | Illegal priority value                                         |
|            | Illegal test access mode for TS0                               |
|            | Illegal test access mode for TS16                              |
|            | Improper roll command sequence                                 |
|            | Inactive side NPC out of service and inactive side in service  |
|            | Incompatible types of NPCs on a circuit pack                   |
|            | Incorrect language/addressing mode                             |
|            | Incorrect number of parameters                                 |
|            | Incorrect or missing password                                  |
|            | Incorrect pack type in slot                                    |
|            | Initialization of application in progress, retry command later |
|            | Input BRD (BBL) has same NPC and channel as BBL (BRD)          |
|            | Insufficient data for setting up a conference                  |
|            | Integrated Test Set is currently active on TG                  |
|            | Invalid NPC number specified                                   |
|            | Invalid PWR/MISC alarm level                                   |
|            | Invalid combination of "x" and "y" values                      |
|            | Invalid combination of "x" and "z" values                      |
|            | Invalid executable on card                                     |
|            | Invalid option, mailbox or flag                                |
|            | ITS NPC Hardware Error                                         |
|            | ITS TG Already Generating                                      |
|            | ITS TG Already Monitoring                                      |
|            | ITS TG is Idle                                                 |
|            | ITS TG Not Generating                                          |
|            | ITS TG Not Monitoring                                          |
|            | LEG mode was assigned to a DSPU-type NPC on the input          |
|            | LLB not initiated                                              |
|            | LPD invalid since existing conference is not already LPD       |
|            | Language "F" provisioned for this channel                      |
|            | Language is not allowed                                        |
|            | Last link in service                                           |
|            | Line Loop Back is active                                       |
|            | Line format types are incompatible                             |
|            | Link being used is not Link 1                                  |
|            | Logical conflicts found in the map                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                      |
|------------|-------------------------------------------------------------------------|
|            | Looped Circuit Access not allowed                                       |
|            | MP database not consistent with Configuration file                      |
|            | Major/Minor BER threshold value is invalid for SLC NPCs                 |
|            | Maj Min BER threshold is 7, but not in T1DM or Fe mode                  |
|            | Map/macro file write deferred until backup is completed                 |
|            | Mapped parity channel(s) on new                                         |
|            | Mate RT/DL mode is different                                            |
|            | Mate sync pack denied command                                           |
|            | Maximum number of CPRs have already been grown for this unit            |
|            | Minor <= major for BER opt                                              |
|            | Minor >= major for COFA opt                                             |
|            | Minor >= major for SLIP opt                                             |
|            | Minor Slip threshold disabled before Major Slip threshold               |
|            | Mismatch between MXR and NPC types                                      |
|            | Mismatch between service MXR and protection MXR types                   |
|            | New NPC already cross-connected or mapped channel(s) exist on New       |
|            | NPC addressing scheme selected is not allowed in the configuration file |
|            | NPC as 12th test port can not change to DMI nor T1DM                    |
|            | NPC has active circuit                                                  |
|            | NPC has been designated as NPCTG                                        |
|            | NPC has been designated as NPCTP                                        |
|            | NPC invalid type                                                        |
|            | NPC is NPCTG and chan 24 is used in a TG; Can't change to T1DM or DMI   |
|            | NPC is NPCTG, changing to CAS/NSA is not allowed                        |
|            | NPC is a Facility Access Digroup                                        |
|            | NPC is a test port                                                      |
|            | NPC is not a NPCTG                                                      |
|            | NPC is not a NPCTP                                                      |
|            | NPC is not added                                                        |
|            | NPC is not designated for this NPCTP/NPCTG                              |
|            | NPC is still provisioned to provide sync timing                         |
|            | NPC not DA or TA type.                                                  |
|            | NPC not deleted                                                         |
|            | NPC not designated as sync timing source                                |
|            | NPC providing timing to inservice SSP                                   |
|            | NPC type error                                                          |
|            | NPC type is inconsistent with FTMI type                                 |
|            | NPC type option xyz is unassigned or invalid for feature package        |
|            | NTR invalid since existing conference is not already NTR                |
|            | New NPC same as existing one                                            |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | New in CGA or PBA                                                   |
|            | No CBTYPE NPC capacity remaining                                    |
|            | No DL digroups can be added until the associated RT bank is created |
|            | No Facility Line Interface (FLI) is In Service                      |
|            | No SAFE alarm for DGP                                               |
|            | No available timeslots on any inservice NPCS associated with FC/FMT |
|            | No edit session active                                              |
|            | No equalization for CEPT FTMI                                       |
|            | No macro is currently executing                                     |
|            | No mapped channel on old                                            |
|            | No protection switch is currently active                            |
|            | No signals active                                                   |
|            | No unmapped time slot                                               |
|            | No user is logged in on the link/vc                                 |
|            | No user/link needs to be changed                                    |
|            | No zeros allowed for DAX privilege                                  |
|            | Not Timing Extractor type TLI (not SSP)                             |
|            | Not a CRO TLI                                                       |
|            | Not a DACS II compatible Flash Card                                 |
|            | Not enough DSPPs are in service                                     |
|            | Not enough TSIs for CCB test                                        |
|            | Not first channel in a BCON/virtual conf                            |
|            | Not valid for frame administrator                                   |
|            | Number of DGPs on each unit is limited to 32                        |
|            | Number of SLC RT's on each unit is limited to 80                    |
|            | OLD termination is not mapped                                       |
|            | Obsolete circuit type                                               |
|            | Old and new channels have not been paired by a BCAST command.       |
|            | One of the FAR end channels is being rolled                         |
|            | One of the far NPC(s) is SLC                                        |
|            | One or more FADs could not be released                              |
|            | One or more test ports could not be released                        |
|            | One way unassigned channel/NPC in QRY,TO                            |
|            | Only one channel allowed to have this language                      |
|            | Option NOT leg can not appear with F, T, or B                       |
|            | Option NOT leg is not a FTU leg                                     |
|            | Option NOT leg is not in conference                                 |
|            | Other FLI is OOS                                                    |
|            | Other NPC on this DDC not the same digroup for Mode I DGA/DGP       |
|            | PDI Version number mismatch                                         |
|            | PMEM and SMEM are different                                         |
|            | PMEM and SMEM synchronization fail                                  |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | PMEM error, boot from SMEM                                        |
|            | PMEM not in service or not ready                                  |
|            | PMEM not restored                                                 |
|            | Parity channel out of bound on new                                |
|            | Password recovery card is not READ-only                           |
|            | Point number mismatch                                             |
|            | Priority values are same                                          |
|            | Problem occurred while accessing BOTH_MEM                         |
|            | Problem occurred while accessing PMEM                             |
|            | Problem occurred while accessing SMEM or unformatted SMEM         |
|            | Protection switch existing is autonomous                          |
|            | RCV continuity test won't be run: SYNC OOS or pested              |
|            | RCV continuity test won't be run: at least one timeslot in use    |
|            | RCV continuity test won't be run: no DMB timeslots available      |
|            | RCV continuity test won't be run: no available IS NPCS for FC/FMT |
|            | RDLD flag doesn't match that of conference                        |
|            | RTBC conference exists                                            |
|            | Range overlapping between FROM and TO or between two TOs          |
|            | Ranges of old and new do not match                                |
|            | Reading Feature Package Id from PMEM failed                       |
|            | Red circuit, INCL not entered                                     |
|            | Release number mismatch                                           |
|            | Report already exists                                             |
|            | SLC 96 MD 1 RT DGP requires mate NPC to be unequipped             |
|            | SMEM error, boot from PMEM                                        |
|            | SMEM is not present                                               |
|            | SMEM unit is not restored                                         |
|            | SR NPC was specified - not allowed                                |
|            | SSC Diagnostic Failure                                            |
|            | SSP number is illegal                                             |
|            | SSP number required                                               |
|            | SSP type(options) same                                            |
|            | SSP with 0 priority present                                       |
|            | SSP with non 0 priority present                                   |
|            | SYNC is inservice but failed                                      |
|            | Signaling state of the trunk failed for the channel               |
|            | Skip error summary since adjacent pack not in service or pested   |
|            | Software Identification Block failed comparison                   |
|            | Software Identification Block is not readable                     |
|            | Some associated NPCs are equipped                                 |
|            | Some circuits not activated,cleared or pictured                   |
|            | Source does not contain requested information                     |
|            | Specified width does not match existing conference width          |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Stratum not allowed                                                 |
|            | Sync architecture different                                         |
|            | Sync architecture is same                                           |
|            | Sync mode is same                                                   |
|            | Sync stratum is same                                                |
|            | Syncs are equipped                                                  |
|            | System macro/map space is full                                      |
|            | T1DM or DMI mode and channel 24 is connected                        |
|            | TB type in hardware mismatches DB                                   |
|            | Termination is a test port                                          |
|            | Termination is protected (RDLD)                                     |
|            | Termination is under customer control (CUS)                         |
|            | Termination is under test                                           |
|            | Test ports must be on CAS                                           |
|            | Test session already exists                                         |
|            | Testport/testgroup channel cannot be rolled                         |
|            | TG in TSM ON mode                                                   |
|            | TG not in TSG ON mode                                               |
|            | TLA/TLR invalid with ITS test groups                                |
|            | TO is a part of the same conference as a previous TO                |
|            | TO is already the return leg                                        |
|            | TO is not a leg of this/any conference                              |
|            | TO is the backbone leg of a conference                              |
|            | TO side of two-way to be converted is not an FTU NPC                |
|            | The INCL keyword is needed for DGA                                  |
|            | The MMFG is protected                                               |
|            | The NDL options are different for DGA's on the same DDC for Mode I  |
|            | The NPC of VC BBL leg doesn't match that in the input command       |
|            | The NPC to delete has not been previously added to map              |
|            | The OLD or NEW NPC is already being rolled.                         |
|            | The associated MMFG is under protection (for Service MIUs)          |
|            | The associated MXR is In-Service but pested                         |
|            | The conference does not exist                                       |
|            | The first channel of VC BBL leg doesn't match that in the input cmd |
|            | The first channel of VC BRD leg doesn't match that in the input cmd |
|            | The input BRD leg is not in VC                                      |
|            | The map is not valid                                                |
|            | The mode of the RT is not applicable                                |
|            | The reference map does not exist                                    |
|            | The requested digroup is carrying service                           |
|            | The selected MIU associated with the NPC is In-Service but failed   |
|            | The selected MXR associated with the NPC is In-Service but failed   |
|            | The session is terminated due to maintenance operation              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                              |
|-------------|-----------------------------------------------------------------|
|             | The total number of receiving ports specified exceeds the max.  |
|             | There are no INS MXRs to run test on                            |
|             | Timeslot channel numbering not allowed with CAS                 |
|             | Timing Extractor type TLI (need SSP info)                       |
|             | Timing Extractor type TLIs are present                          |
|             | Transmic 1G NPC designated as SYNC source invalid               |
|             | Transmitting port cannot be dropped                             |
|             | Tried to disconnect a nonexisting VC                            |
|             | Trunk conditioning doesn't match that of conference             |
|             | Try to add a BBL to VC, but the VC already has backbone         |
|             | Try to delete a BBL leg from VC; however, VC has no BBL leg     |
|             | Try to delete a BRD leg from VC; however, VC has no BRD leg     |
|             | Trying to add a BBL leg to a conference set up as SYM           |
|             | Trying to add a BBL to a DMB conference that already has one    |
|             | Trying to add a SYM leg to conference set up as broadcast       |
|             | Trying to add a broadcast leg to a conference set up as SYM     |
|             | Trying to add or delete a leg when a conference is under test   |
|             | Trying to change in NTR direction                               |
|             | Trying to change level in on BBL leg                            |
|             | Trying to change level out on BRD leg                           |
|             | TS0 connected to nonTS0 in Mode 2 - "a" should be "-" or "b"    |
|             | Two digroups from same bank added to different FTMIIs           |
|             | UC is in service but failed                                     |
|             | Unable to verify Configuration file since MP DB not loaded      |
|             | Unassigned operational mode                                     |
|             | Unframed clear 2Mbit/s NPC invalid for Bit 4 used as RA IS/RBER |
|             | Unframed clear 2Mbit/s NPC invalid for TS0 processing           |
|             | Unit is not FTU type                                            |
|             | Unit type error                                                 |
|             | Unmapped channel(s) on old                                      |
|             | Unpestering error registers for subj. entity failed             |
|             | Use of this NPC is RESERVED for SLC 96 MD 1                     |
|             | User does not exist                                             |
|             | User has been created                                           |
|             | User has logged in somewhere                                    |
|             | User is not logged in                                           |
|             | User logged off during session                                  |
|             | User login-id is not DAX                                        |
|             | User macro/map space is full                                    |
|             | User quit the menu                                              |
|             | User still owns files                                           |
|             | Width of existing two way does not match conference width       |
|             | Write to CPR failed                                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Writing Feature Package Id to PMEM failed                            |
|            | Wrong SSP type(Timing Extractor type)                                |
|            | Wrong TLI type                                                       |
|            | Wrong TLI type (need CRO grow command)                               |
|            | X option is illegal                                                  |
|            | XMIT continuity test won't be run: CFT code specified                |
|            | XMIT continuity test won't be run: no XMIT timeslots available       |
|            | Y option is illegal                                                  |
|            | Z option is illegal                                                  |
|            | Channel is OCON in opposite direction                                |
|            | Circuit already terminated                                           |
|            | Circuit not terminated                                               |
|            | Hub id not set when MJU pack grown                                   |
|            | Invalid mode for TLA/TLR                                             |
|            | Invalid test access mode                                             |
| SOSF       | All CBTYPE NPCs out of service or failed                             |
|            | DSPU unit controller is failed                                       |
| SPFA       | No protection is available for the Service MMFG                      |
|            | Protection switch process failed                                     |
| SPSW       | The Protection MMFG is selected, and auto. switchback is unavailable |
|            | The protection MMFG is serving another facility                      |
| SROF       | (NPC) Hardware mismatch                                              |
|            | BOOT on subject entity failed                                        |
|            | CCN denied request                                                   |
|            | Can't lock or unlock ram database                                    |
|            | Circuits TCONed itself cannot be UTST                                |
|            | DB can't get the slave mail box                                      |
|            | DB can't send or receive mail                                        |
|            | DGN on subject entity failed                                         |
|            | Failed to boot CI                                                    |
|            | Failed to boot CONF file                                             |
|            | Failed to boot DB                                                    |
|            | Failed to boot journal--recurrence indicates database corruption     |
|            | Failed to boot subject CCN side                                      |
|            | Failed to boot unit                                                  |
|            | Failed to switch SYNC side                                           |
|            | General boot failure (vanilla flavor)                                |
|            | IU/TI type NPC                                                       |
|            | MIU is failed                                                        |
|            | MXR is failed                                                        |
|            | Mismatch between MXR and MIU HDW types                               |
|            | NPC Failed or Out of Service                                         |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                         |
|------------|------------------------------------------------------------|
|            | No Memory Backup Has Been Scheduled                        |
|            | None of the designated NPCTG(s) are equipped               |
|            | None of the designated TG(s) are equipped                  |
|            | PMEM verification failed                                   |
|            | Read/write eeprom error                                    |
|            | RST failed to boot DB                                      |
|            | RST failed to boot program                                 |
|            | SSC software out of date                                   |
|            | Sync not completely reset                                  |
|            | Sync pack denied command                                   |
|            | Syncs failed to cross couple                               |
|            | The MIU boot failed                                        |
|            | The MIU diagnostics failed                                 |
|            | The MXR boot failed                                        |
|            | The MXR diagnostics failed                                 |
|            | Unit 1 denied request                                      |
|            | Unit 2 denied request                                      |
|            | Unit 3 denied request                                      |
|            | Unit 4 denied request                                      |
|            | Unit 5 denied request                                      |
|            | Unit 6 denied request                                      |
|            | Wrong MXR type grown for this MIU                          |
| SRTN       | Test Port release failed                                   |
|            | Test group release failed                                  |
| SWFA       | Active CCN side not IS or failed or pested or hardware OOS |
|            | Boot TLI failed                                            |
|            | Checksums verification failed                              |
|            | DB PMEM error OP-CL-RD-WR-SK                               |
|            | DB SMEM error OP-CL-RD-WR-SK                               |
|            | DSPI failed                                                |
|            | Data link failed                                           |
|            | Device failed to format                                    |
|            | Device failed to initialize                                |
|            | Failed to lock sync to timing reference                    |
|            | Far end failed to respond                                  |
|            | Hardware database mismatch                                 |
|            | MXR LOS with unselected FLI                                |
|            | Selected FLI has LOC with at least one inservice MXR       |
|            | Sync is not configured yet                                 |
|            | Unselected FLI has LOS with at least one inservice MXR     |

## 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).

**BERT**

Bit Error Ratio Tester.

**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.

**C-Bit**

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.

**CR**

Critical Alarm

**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.

**CVL**

Coding Violations - Line.

**CVP**

Coding Violations - Path.

---

**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.

**DND**

DACS II Network Director.

**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.

**DSL**

Digital Subscriber Line.

**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:

$$E1 = (32 \text{ Channels} \times 8 \text{ bit/sample}) \times 8000 \text{ samples/sec}$$

$$E1 = 256 \times 8000 = 2.048 \text{ Mb/s}$$

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.

**EMS**

Element Management System.

**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.

**ESL**

Errored Seconds for the DS3 Line.



**ESP**

Errored Seconds for the DS3 Path.

**ESR**

Error Source Register or Errored Seconds Ratio.

**ESR1**

Error Source Register 1.

**ESR2**

Error Source Register 2.

**Ethernet**

A local area network (LAN) technology that transmits information between computers at speeds of 10 to 100 Mbps.

**ETSI**

European Telecommunication Standardization Institute.

**EXZ**

Excessive Zeroes.

---

**F****FAL**

Fuse Alarm Lamp.

**FAS**

Frame Alignment Signal.

**FAW**

Frame Alignment Word.

**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**

Far End Loss of CRC-4 Frame Alignment

**FLI**

Facility-Line Interface.

**FMAC**

Facility Maintenance and Administration Center.

**FMP**

F- and M-bit framing errors - Path.

**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.

**FSESP**

Far-End Severely Errored Seconds - Path.

**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.

**GUI**

Graphical User Interface.

---

**H****HDB3**

High Density Bipolar 3 Zero Substitution.

**HDS3U**

Hybrid DS3 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****ICI**

Intelligent Communication Interface circuit pack (TM 782).

**IDLD**

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.

**IEEE**

Institute of Electrical and Electronics Engineers.

**IFTU**

Integrated Facility Terminating Unit.

**IITL**

Interface Information Transfer Letter.

**In Service**

The entity is performing normal service functions, either active or standby.

**IP**

Internet Protocol, used to route data to its appropriate destination.

**IS**

See In-Service.

**ITS**

Integrated Test Set.

**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.

**LCMA**

Loss of CRC-4 Multiframe Alignment.

**LED**

Light-Emitting Diode.

**LFA**

Loss of Frame Alignment.

**LILB**

Line Interface Loopback.

**Link**

A user interface connection into the DACS II system.

**Link ID**

The location and type of a user interface link.

**LLB**

Line Loopback.

**LMA**

Loss of Multiframe Alignment.

**Location**

The specific entity involved.

**LOF**

Loss of Frame.

**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.

**MFA**

Multiframe Alignment.

**MI**

1. Maintenance Information. 2. Minor Alarm.

**MIU**

Multipoint Interface Unit.

**MJ**

Major Alarm.

**MJU**

Multipoint Junction Unit.

**MMFG**

Multiplexer-MIU Functional Group or HMXR-MIU Functional Group.

**MML**

HuMan-Machine Language (a language used by the DACS II).

**MP**

Main Processor.

**MPDIS**

Multipoint Disconnect

**MPM**

Multipoint Mode.

**MTC**

Maintenance Circuit.

**MXR**

Multiplexer.

---

**N****NA**

No acknowledgement.

**NAS**

Non Associated Signaling.

**NDL**

No Data Link.

**NEBS**

Network Equipment Building Systems.

**Network Element**

An individual system in a network of other systems. A DACS II system is a network element.

**NFW**

Non 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.

**OCON**

One-Way Cross-Connect.

**OCNT**

One-Way Cross-Connect, Terminated.

**ODIS**

One-Way Disconnect.

**OFS**

Out-Of-Frame Seconds.

**OOF**

Out-of-Frame.

**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 (a language used by the DACS II).

PF

Printout Follows.

PFW

Pseudo-Frame Word.

PLL

Phase-Locked Loop.

PM

Performance Monitoring.

PMA

Prompt Maintenance Alarm.

PMEM

Primary Memory flash card for the DACS II.

PNI

Packet Network Interface.

POF

Pseudo Frame Word Out of Frame.

POTS

Plain Old Telephone Service.

PRBS

Pseudo-Random Bit Sequence.

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.

**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.

**RLS**

Terminate and Leave Release (MML language).

**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.

**SEF**

Severely Errored Frame.

**SERS**

Severely Errored Seconds.

**SESL**

Severely Errored Seconds for the DS3 Line.

**SESP**

Severely Errored Seconds for the DS3 Path.

**SESR**

Severely Errored Seconds Ratio.

**SFI**

Synchronizer Failure Indication.

**SID**

Source Identifier.

**SMEM**

Secondary Memory flash card for the DACS II.

**SNIDER**

Protocol (message format) used on asynchronous administrative links.

**SNMP**

Simple Network Management Protocol, used for building a single management system to perform provisioning, cross-connections and test access for multiple DACS II, etc.

**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/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.

**TA1**

TS16 All Ones alarm.

**TB**

Time Base.

**TC**

Trunk Conditioning.

**TCP**

Transmission Control Protocol, used to transfer data from one terminal to another.

**TCP/IP**

Transmission Control Protocol/Internet Protocol, a suite of protocols developed to allow cooperating computers to share resources across a network.

**TCNT**

Two-Way Cross-Connection, Terminated.

**TCON**

Two-Way Cross-Connection.

**TD**

Timing Distributor.

**TDIS**

Two-Way Disconnection.

**TDM**

Time Division Multiplexed.

**TELNET**

Remote Terminal Protocol, allows a user at one location to access a remote server at another location.

**TERM**

Terminate and Leave Activate (MML language).

**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 (PDS language).

**TLI**

Timing Link Interface.

**TLP**

Transmission Level Point.

**TLR**

Terminate and Leave Release (MML language).

**TP**

Test Port.

**TPR**

Test Port Release.

**TSI**

Time Slot Interchange.

**TTY**

Teletypewriter Terminal.

---

**U**

UAC  
Unassigned Channel Code.

UAS  
Unavailable Seconds.

UASP  
Unavailable Seconds - Path.

UATC  
Unavailable Time Count.

UBX  
Unit Bus Extender.

UC  
Unit Controller.

UMC  
Unassigned Multiplexer Code.

---

**V**

VC  
Virtual Circuit.

---

**X**

X.25  
Protocol (message format) used on synchronous administrative links.

---

**Z**

ZBTSI  
Zero Byte Time Slot Interchange.

ZCS  
Zero Code Suppression.



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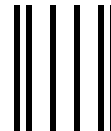
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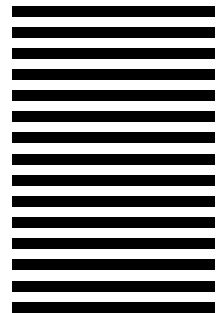
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## About This Manual

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## **Background**

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### **Purpose**

The purpose of this manual is to aid in acceptance and operation of the Digital Access and Cross-Connect System II (DACS II).

This document provides reference information required to support the craft personnel activities involved in the daily operation and maintenance of the DACS II. It also includes an overview that describes the physical and functional attributes of the DACS II.

---

### **Intended Audiences**

This document is for individuals who are responsible for the acceptance, provisioning, operation, and maintenance of the DACS II, Release 9.0.

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## New Features in This Release

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### Overview

The new features associated with DACS II Release 9.0 are:

- Threshold support for the Hybrid DS3 circuits
  - The introduction of the Intelligent Communication Interface (ICI) circuit pack.
  - Integrated Test Set (ITS).
- 

### Hybrid DS3 Threshold Support

This feature adds threshold support to the performance monitoring feature for Hybrid DS3 circuits. Users can set up four separate threshold values including the default threshold value for each performance monitoring parameter. When a threshold is crossed, a threshold crossing message is issued. However, with this feature, threshold crossings and their associated alarm messages can be suppressed (turned off).

---

### ICI Circuit Pack

The Intelligent Communication Interface (ICI) circuit pack (TM 782 card) provides the port connections for the seven administrative links:

- Four asynchronous links (links 1 through 4, SNIDER protocol)
- Two synchronous links (links 5 and 6, X.25 protocol)
- One TCP/IP link (link 7, telnet protocol).

The ICI circuit pack replaces the Main Controller's H/ECI circuit pack used prior to Release 9.0, and even plugs into the same slot used for the H/ECI circuit pack. The ICI pack will have all of the existing functionality of the H/ECI pack except the functionality available with the additional TCP/IP link connection.

---

### ITS

The Integrated Test Set (ITS) feature provides the DACS II with a built-in Bit Error Ratio Tester (BERT) capability. The ITS was developed to replace expensive test sets for facility troubleshooting, providing the capability of generating, reading, and evaluating test signals from the DACS II.

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### Non-CEF Information

Release 9.0 does not support Non-CEF frames. However, the Non-CEF information is left in the documentation for reference purposes.

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## How to Use This Manual

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### **Before Using the Procedures**

Before you attempt to use the procedures in this manual, you should become familiar with the contents of each volume.

---

### **Accessing the Information**

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

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

### **Prerequisites**

Before you use the procedures in this document, you should have completed the DACS II Operation and Maintenance course (TR3521 or TR3621).

If you were not able to take the training course, you should carefully study the information in Chapter 1 and the Command Denials located in Appendix A of Volumes I, II, and III.

---

### **Procedure Sequence**

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 the Trouble Identification section in Chapter 1 of Volume III. The sections in this volume 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.

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## Manual Contents

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### Volume Breakdown

This manual is divided into the following three volumes:

- Volume I - Operation and Maintenance Reference Material
- Volume II - Operation and Maintenance General Tasks
- Volume III - Trouble Clearing General Tasks.

The reference information in Volume I supports the General Tasks (procedures) documented in Volumes II and III.

---

### General Tasks and Supporting Elements

The chapters in Volume II and III are divided into General Tasks (GT) and Supporting Elements (SE). GTs are the major tasks performed by users, and SEs are sub-tasks within a GT.

There is a correspondence between the chapter numbers in Volume I and the GTs in Volume II. For example, the general tasks related to reference Chapter 6: Cross-connections and Disconnections begin at GT 6.1. In Volume III, the GTs for a particular type of trouble are grouped together in one chapter.

SEs are associated with a GT and are usually located immediately after the GT. Some SEs are reusable in other GTs in that particular chapter and in the GTs of other chapters. When a GT step requires an SE, the SE will typically be found at the end of the GT. GTs and SEs follow a similar numbering scheme. For example, *SE 5.1.1* indicates the first SE in GT 5.1.

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## Manual Contents (Continued)

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### Contents of Volume I

The contents of *Volume I - Operation and Maintenance Reference Material* are listed below:

■ **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 reference information which describes the acceptance of a DACS II frame after it has been installed.

■ **Chapter 3 - Provisioning**

This chapter contains reference information which describes circuit pack installation and the growing, restoring, removing, and degrowing of the common equipment (frame, synchronizer, and cross-connect network) and Units (FTU, DS3U, HDS3U, and DSPU).

■ **Chapter 4 - Test Access**

This chapter contains reference information which describes establishing test ports, making the DS0 and Clear-DS1 test connections, and establishing and testing subrate channels.

■ **Chapter 5 - Cross-Connections and Disconnections**

This chapter contains the reference information which describes making DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

■ **Chapter 6 - Administration**

This chapter contains the reference information which describes logging on/off the DACS II; creating, changing, and deleting alternate maps; and creating, activating, and deleting macros.

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## Manual Contents (Continued)

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### Contents of Volume I, Continued

#### ■ Chapter 7 - Maintenance

This chapter contains the reference information which describes routine PMEM and SMEM memory card maintenance, PMEM and SMEM card removal, and plug-in removal and replacement.

#### ■ Chapter 8 - Performance Monitoring

This chapter contains the reference information which describes scheduling and retrieving reports that monitor various DS1 performance parameters.

#### ■ Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume II

The contents of *Volume II - Operation and Maintenance General Tasks* are listed below:

- **Chapter 1 - (Left Intentionally Blank)**

- **Chapter 2 - Acceptance General Tasks**

This chapter contains the procedures to perform the acceptance of a DACS II frame after it has been installed.

- **Chapter 3 - Provisioning General Tasks**

This chapter contains the procedures to install circuit packs and to grow, restore, remove, and degrow the NPCs (FTU with or without *SLC*<sup>®</sup> Carrier, DS3U, HDS3U, and DSPU, Subrate, DMB, or DSP Applications).

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

- **Chapter 4 - Test Access General Tasks**

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

- **Chapter 5 - Cross-connections and Disconnections General Tasks**

This chapter contains the procedures to make DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

- **Chapter 6 - Administration General Tasks**

This chapter contains the procedures to make DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

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## **Manual Contents (Continued)**

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### **Contents of Volume II, Continued**

- **Chapter 7 - Maintenance General Tasks**

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

- **Chapter 8 - Performance Monitoring General Tasks**

This chapter contains the procedures to schedule and retrieve reports that monitor various DS1 performance parameters.

- **Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume III

The contents of *Volume III - Trouble Clearing General Tasks* are listed below:

- **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**

This chapter contains procedures for isolating 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**

This chapter contains procedures for isolating a conditional reset or back-up memory trouble.

- **Chapter 8 - Frame Audits**

This chapter contains procedures for isolating faults detected when frame audits are run.

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## **Manual Contents (Continued)**

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### **Contents of Volume III, Continued**

- **Chapter 9 - Software Error**

This chapter contains procedures for troubles indicated by a software trouble message.

- **Appendix A - Command Denials**

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

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## Manual Conventions

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**Special Font Used** This manual uses special fonts to differentiate computer input/output. The **constant width bold font** indicates message formats, keywords, letter representations of parameters, parameter values, and messages as they would appear on a DACS II terminal screen.

---

**Notes** Notes inform users of special considerations, situations, or items to remember. An example of a Note is shown below:



**NOTE:**

Terminated connection for DMB concatenation is not allowed.

---

**Safety Label**

Cautions indicate the presence of a hazard that will or can cause a frame alarm or property damage if hazard is not avoided. An example of a Caution is shown below:



**CAUTION:**

*The UMC is inserted towards the direction that is terminated, potentially causing a loss of service.*

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## Related Documentation

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### Related DACS II Documents

The following documents support the DACS II:

- DACS II Installation Manual
  - IPH903 (DACS II CEF)
  - IPH903I (DACS II ESBF).

**Audience:** Customers planning to install the equipment

**Content:** Customer installation instructions.

- DACS II Release 7.0 Product Description Manuals:
  - 365-353-085 (24 Channel)
  - 365-353-086 (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 9.0 Operation and Maintenance Manuals:
  - 365-353-261 (PDS)
  - 365-353-271 (MML)
  - 365-353-281 (PDS 2.048-Mb/s Interface)
  - 365-353-291 (MML 2.048-Mb/s Interface).

**Audience:** End-user maintenance personnel

**Contents:** Procedures to operate and maintain the DACS II.

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- DACS II Release 9.0 Command and Message Manuals:

- 365-353-262 (PDS)
- 365-353-272 (MML)
- 365-353-282 (PDS 2.048-Mb/s Interface)
- 365-353-292 (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 9.0 Quick Reference Guides:

- 365-353-263 (PDS)
- 365-353-273 (MML)
- 365-353-283 (PDS 2.048-Mb/s)
- 365-353-293 (MML 2.048-Mb/s).

**Audience:** End-user maintenance personnel

**Content:** Abbreviated list of system commands and parameters.

- DACS II Release 9.0 Software Release Description:

- Comcode C108460080

**Audience:** End-user maintenance personnel

**Content:** Includes upgrade procedures for the new software release, status of problems fixed in previous releases, list of known problems, and operating issues for the specified software release.

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- X.50/X.57 Subrate Application  
Release 1.0.3 for DACS II/Release 1.0.4 for DACS II ISX  
MML 2.048 Mbit/s Interface User's Manual

— 365-350-101 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the X.50/X.57 Subrate application on the DACS II or DACS II ISX. Commands and messages describing how to perform subrate cross-connects and subrate test access are included.

- DDS Subrate and MJU Application  
Release 1.0.4 for DACS II/Release 1.0.5 for DACS II ISX  
User's Manual

— 365-350-110 (PDS)

— 365-350-111 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DDS Subrate and MJU application on the DACS II or DACS II ISX. Commands and messages describing how to perform DDS subrate cross-connects, subrate test access, and subrate MJU operations are included.

- Digital Multipoint Bridge (DMB)  
DSP Platform Application  
Release 1.0.2 for DACS II/Release 1.0.3 for DACS II ISX  
User's Manual

— 365-353-144 (PDS)

— 365-353-154 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DMB application on the DACS II or DACS II ISX. Commands and messages describing how to perform DMB cross-connects and DMB test access operations are included.

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## How to Order Documentation

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### Overview

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## How to Order Documentation (Continued)

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## Electronic Documentation

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### Overview

Documentation for DACS II and DACS II ISX is now available in electronic form, on CD-ROM (compact disk, read-only memory). CD-ROM has many advantages over traditional paper documentation, including cost savings, search and retrieve capability, and the assurance of the most current documentation.

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# 1

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## Acceptance General Tasks

# 2

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### Contents

|                                                                                  |           |
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| ■ Perform Visual Inspection                                                      | GT 2.1-1  |
| ■ Check Circuit Pack Installation                                                | GT 2.2-1  |
| ■ Review Frame and Link Setup                                                    | GT 2.3-1  |
| ■ Initialize and Test Alarms                                                     | GT 2.4-1  |
| ■ Check and Set Time-Clock, Facility Report Utilities, and<br>Auto Backup Memory | GT 2.5-1  |
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---



---

## Perform Visual Inspection

# 2.1

---

### When to Use

Use this set of procedures to inspect the front and back of the frame for obvious structural damage.

---

### Related Information

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## **Instructions**

---

### **Task**

| <b>Step</b> | <b>Action</b>           | <b>Reference</b>    |
|-------------|-------------------------|---------------------|
| 1           | Inspect front of frame. | SE 2.1.1 page 2.1-3 |
| 2           | Inspect back of frame.  | SE 2.1.2 page 2.1-4 |

---

## **SE 2.1.1: Inspect Front of Frame**

---

### **Procedure**

Use this procedure to inspect the front of the frame for obvious structural damage.

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.
  3. Verify that shelf designation labels are installed in front over shelf slots.
-

## SE 2.1.2: Inspect Back of Frame

### Procedure

Use this procedure to inspect the back of the frame for obvious structural damage.

1. Check back of frame for damage such as dents or broken mountings.
2. Look for broken or bent pins near the edges of each printed backplane panel; these pins can be damaged even with the covers installed.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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).
  - Use a G9 adapter for a link to CIU (craft interface unit) for *SLC*<sup>®</sup> Series 5 carrier. This is for an asynchronous link.



#### 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.

8. 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 DSX-1 jack bay.
  9. Talk with an installation representative to verify that cabling to DSX-1 jack bay has been tested for continuity (buzzed and CGAs [carrier group alarms] registered when lines were opened).
  10. Verify that DACS II and DSX-1 jack bays have been stamped with office relay rack identification per office drawings.
-





---

**When to Use**

Use this set of procedures to check circuit pack installation in the frame.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## Instructions

---

### Tasks

Complete the following steps to make sure the circuit packs in the frame are properly installed:

| Step | Action                                                                 | Reference           |
|------|------------------------------------------------------------------------|---------------------|
| 1    | Check main controller installation and sync circuit pack installation. | SE 2.2.1 page 2.2-3 |
| 2    | Check FTU circuit pack installation.                                   | SE 2.2.2 page 2.2-4 |
| 3    | Check ECCN/CCN multibay circuit pack installation.                     | SE 2.2.3 page 2.2-5 |
| 4    | Check ECCN/CCN single-bay circuit pack installation.                   | SE 2.2.4 page 2.2-6 |
| 5    | Check power units and fuses.                                           | SE 2.2.5 page 2.2-7 |
| 6    | Check DSPU circuit pack installation.                                  | SE 2.2.6 page 2.2-8 |
| 7    | Check DS3U or HDS3U circuit pack installation.                         | SE 2.2.7 page 2.2-9 |

---

## SE 2.2.1: Check Main Controller Installation and Check Sync Circuit Pack Installation

---

### Procedure

Use this procedure to verify that the main controller has been installed and to verify that sync circuit packs in the frame are properly installed and to query the units to see how they are configured.

1. Verify that the main controller has been installed.
  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 signals for slaved timing.
    - Timing distribution, whether DACS II supplies timing to other equipment in the office.
  3. Enter **RTRV-STATE-EQPT: :SYNC:EQPD;** to see the TB (time base) and TLI (timing link interface) type designations.
  4. Check the query output, then read the following:
    - The TB types are TB000 for North American-stratum 3, TB100 for 2.048-Mb/s Interface - local office, TB200 for 2.048-Mb/s Interface - toll office, and TB300 for North American-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).
  5. Enter **RTRV-STATE-EQPT: :SYNC;**.
  6. If CFR (sync configuration) = MASTER, verify that a TB card is installed in the designated slots.
  7. Verify that there are duplicate TLI cards (on sides 0 and 1) for each incoming and timing distribution link.
  8. 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.
  9. 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.
-

## SE 2.2.2: Check FTU Circuit Pack Installation

---

### Procedure

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

1. Determine which unit and FTMs (facility terminating modules) are to be equipped.
2. Verify the **TG81** code FTMI and the **TG79** code of FCs (format converters) are installed for the equipped FTMs.
3. Verify the circuit pack dual digroup cards (for example, DDC) for the equipped NPCs are installed in the NPC slots.



#### NOTE:

Each circuit pack card contains the circuitry for two NPCs.

---

---

### SE 2.2.3: Check ECCN/CCN Circuit Pack Installation - Multibay

---

**Instructions**

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.
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).
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.

---

## **SE 2.2.4: Check ECCN/CCN Circuit Pack Installation - Single-Bay Circuit**

### **Procedure**

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.
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.

## SE 2.2.5: Check Power Units and Fuses

---

### Procedure

Use this procedure to verify that all power units and fuses are properly installed.

1. Locate the power unit slots for the section of the frame being equipped using shelf designation strips.
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). 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 power requirements are met, disconnect the meter.
- If the power requirements are not met, replace the power unit.

## SE 2.2.6: Check DSPU Circuit Pack Installation

### Procedure

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

1. Familiarize yourself with the DSPU shelf.
2. Verify that all DSPUs are properly installed. See Table 2.2-1.

**Table 2.2-1. DSPU Power Units and Fuses**

| Fuse                                                   | Side   | DSP Position (Note) |
|--------------------------------------------------------|--------|---------------------|
| (Top)                                                  | 0 DSPU | (Left Panel)        |
| No. 1                                                  |        | First and second    |
| No. 2                                                  |        | Third and fourth    |
| No. 3                                                  |        | Fifth and sixth     |
| No. 4                                                  |        | Seventh and eighth  |
| (Bottom)                                               | 1 DSPU | (Right Panel)       |
| No. 5                                                  |        | First and second    |
| No. 6                                                  |        | Third and fourth    |
| No. 7                                                  |        | Fifth and sixth     |
| No. 8                                                  |        | Seventh and eighth  |
| <b>Note:</b> Each fuse supplies two DSP circuit packs. |        |                     |



## SE 2.2.7: Check DS3U or HDS3U Circuit Pack Installation

---

### Procedure

Use this procedure to verify that all the DS3U or HDS3U circuit packs in the frame are properly installed.

1. Familiarize yourself with the designated positions on the DS3U or HDS3U shelf. Notice that an MMFG consists of MXR (or HMXR) positions and that there is an MMFG for protection switching.
2. Familiarize yourself with the method of installing packs as follows:
  - Use the wrist strap and observe ESD precautions when handling the pack.
  - While holding the circuit pack 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.
3. If not already installed, install the 563A power units in designated slots. Verify that all the green power LEDs are lighted and that no red failure LED is lighted.

**NOTE:**

Two of the three power units will supply the load, but the third one is required for backup reserve power.

4. Verify that all the 80-type fuses are installed in the fuse board.
  5. Disconnect any one of the power units and verify that the red failure indicator on the other two power units does not light.
  6. Return the power unit to operation.
  7. Repeat the above test (disconnecting a different 563A unit, observing the LEDs on others, and repowering) to test all combinations in the power group.
-



---

**When to Use**

Use this procedure to review the frame and link configuration.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## Instructions

---

**Task**

Complete the following steps to review the frame and link configuration:

| Step | Action                                    | Reference           |
|------|-------------------------------------------|---------------------|
| 1    | Check frame, software, and feature setup. | SE 2.3.1 page 2.3-3 |
| 2    | Check link setup.                         | SE 2.3.2 page 2.3-4 |
| 3    | Check status register.                    | SE 2.3.3 page 2.3-8 |

---

---

## **SE 2.3.1: Check Frame, Software, and Feature Setup**

---

### **Procedure**

Use this procedure to check the frame, software, and feature setup.

1. If command has not already been entered to see the configuration, enter **RTRV-PRMTR-NE;**.
  2. To see the frame ID and the version of software, enter **RTRV-HDR-NE;**.
  3. To see which features are enabled, enter **RTRV-FPKG-NE;**.
-

## SE 2.3.2: Check Link Setup

### Procedure

Use this procedure to review the link configuration.

1. Enter

```
RTRV-PRVG-{USER|TERM}::::{<user id>|<link No.>|ALL};
```

Where:

USER|TERM = Selects whether user or link identification will be used in the command.

user id = Particular user ID

<link No.> = Identification of user link(s) to be queried; either given physical link (1 through 6) and virtual circuit (for synchronous, 01 through 16).

ALL = All users (frame administrator 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 2.3-1.
  - 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 2.3-2. For numbers 3 and 4, use Table 2.3-1 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 (huMan-Machine Language), or F (Facility Data Link Communication Protocol Language).

**NOTE:**

The FDL language may only be provisioned for a single virtual circuit on an x.25 link. Once the X.25 link is set up, provisioning this function only requires the user to specify the language "F" for the virtual circuit; no other I/O parameters affect this channel, except the NPC addressing option.

- 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 2.3-1. Command Grouping**

| <b>a</b><br>Circuit Provisioning                                                                                                                                                                                          | <b>b</b><br>Equip Provisioning                                                                                                                                                                 | <b>c</b><br>Maintenance                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALW-SW-T1<br>CONN-BDCST-T0<br>CONN-CRS-T0<br>CONN-CRS-TS<br>CONN-CRS1-T0<br>CRTE-CRS-TS<br>DLT-CRS-TS<br>DISC-BDCST-T0<br>DISC-CRS-T0<br>DISC-CRS-TS<br>DISC-CRS1-T0<br>INH-SW-T1<br>SW-TOPROTN-T1<br>SW-TOWKG-T1         | CRTE-CNFGRN-EQPT<br>CRTE-EQPT<br>CRTE-LGN<br>DLT-LGN<br>DLT-MACRO<br>DLT-MAP<br>DLT-PRMTR-EQPT<br>ED-PRMTR-EQPT<br>ED-PRMTR-LINK<br>ED-PRMTR-NE<br>DISC-EQPT<br>SET-PRVG-TERM<br>SET-PRVG-USER | DGN-EQPT<br>ED-PRMTR-EQPT<br>ENT-EQPT<br>INIT-SYS<br>RMV-CNFGRN-EQPT<br>RMV-EQPT<br>RST-CNFGRN-EQPT<br>RST-EQPT<br>SW-DX-EQPT<br>-<br>-                                                                                        |
| <b>d</b><br>Test Access                                                                                                                                                                                                   | <b>e</b><br>Monitoring                                                                                                                                                                         | <b>f</b><br>Common                                                                                                                                                                                                             |
| ALW-LPBK-T1<br>CHG-TL-T0<br>CHG-TL-TS<br>CONN-HUB-T0<br>CONN-TACC-T0<br>CONN-TACC-TS<br>DISC-TACC-T0<br>DISC-TACC-TS<br>INH-LPBK-T1<br>OPR-LPBK-T0<br>OPR-LPBK-T1<br>RLS-LPBK-T1<br>-<br>-                                | CPY-MEM<br>ED-DATE<br>INIT-LOG<br>INIT-REG<br>OPR-ACO-ALL<br>RST-PASSWD<br>SCHED-PMREPT-ALL<br>SET-ATTR-EQP<br>STA-LOCL-RST<br>RTRV<br>-<br>-                                                  | CHG-LGN<br>CHG-RPATH-T0<br>ED-CNFGRN-EQPT<br>ED-CONN-TS<br>ED-CRTE-TS<br>ED-OPT-T1<br>ED-PRMTR-EQPT<br>ED-PRMTR-MACRO/MAP<br>ED-PRMTR-NE<br>ED-PRMTR-T0<br>ED-PRMTR-TS<br>ENT-MACRO/MAP<br>EXC-MACRO/MAP<br>SET-PRVG-TERM/USER |
| <b>g</b><br>Restricted Maintenance (RMON Option)                                                                                                                                                                          |                                                                                                                                                                                                |                                                                                                                                                                                                                                |
| RST-EQPT::MC::FRC;<br>RST-EQPT::SMEM::CLR:FRC;<br>DLT-FPKG;<br>ED-PRMTR-ALMS::::{ON OFF};<br>ED-PRMTR-MSGLOG::::{ON OFF};<br>CPY-MEM::::PMEM, SMEM:PROG;<br>INIT-MSGLOG::::RSTNUM;<br>UPGRD-SYS;<br>STA-LOCL-RST::::PMEM; |                                                                                                                                                                                                |                                                                                                                                                                                                                                |



**Table 2.3-2. Screening Options**

| <b>Screening Option (n)</b> | <b>Definition</b>                                                                                                                                                                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                      |

## SE 2.3.3: Check Status Register

### Procedure

1. Enter **RTRV-PRMTR-LINK: : j [mm]** ; to familiarize yourself with the output.

Where:

j = Link number

mm = Virtual circuit number.

2. Refer to Figure 2.3-1 to see the bit definition (meaning of 1s) of the raw data field.

\*Protocol\*/

"{S/X}"

/\*Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status\*/

"bb:e:k:q:x:m,p,hh"

Protocol = S for Snider (Async) or X for X.25 (Synchronous)

bb = <baud> = 03,06,12,24,48,96

e = <backspace> = 0 for true backspace, 1 for underscore backspace, or dash (—) for synchronous link.

k = <alarm> = 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.

m = <mode> = 0 (idle), 1 (input message), or 2 (output message)

p = <software> = 0 (protocol exchanges in-service) or 1 (protocol exchanges out-of-service, which slows down DACS II response time)

hh = <hardware> = 03 (hardware in-service) or 04 (hardware out-of-service)

ADDITIONAL LINES FOR X.25:

/\*Data Link Layer parameters: Frame address\*/

"K-b,T1-eee,T3-ggg,N2-aa:{A/B}"

/\*Packet Layer parameters\*/

"W-c,P-ddd,T20-iii,T22-jjj,T23-kkk,T25-lll,T26-mmm,R20-nn,R22-p,R23-q,R25-r"

/\*PVC and SVC range: PVC and SVC group number\*/

"ppss:gghh"

TCP/IP Format:

<xy> yy-mm-dd hh:mm:ss [LINK-<link number>]

M RTRV PRMTR LINK::j:[ww] COMPLD

/\* [S/X] \*/

/\* Protocol \*/

"I"

/\* Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status \*/

"e:k::,xxxx,hh"

**Figure 2.3-1. Link Status Register**

---

**When to Use**

Use this set of procedures to verify that alarms have been set up to match your frame configuration and to test the alarm(s) operation.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## Instructions

---

### Tasks

| Step | Action             | Reference           |
|------|--------------------|---------------------|
| 1    | Initialize alarms. | SE 2.4.1 page 2.4-3 |
| 2    | Test alarms.       | SE 2.4.2 page 2.4-4 |

---

---

## SE 2.4.1: Initialize Alarms

---

### Procedure

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

1. Enter **SET-ATTR-EQPT:::ALM-a;**.

Where:

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.
-

## SE 2.4.2: Test Alarm Operation

### Procedure

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-EQPT::UNIT-[q]q::FTMI-d;**  
 Where:
  - [q]q = Unit number (1 through 16).
  - d = FTMI number (1 through 4).
5. Disengage one of the DDC (or 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 DDCs (or 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 DDCs (or DPCs) back into the slots and enter  
**RST-EQPT::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, 01-1-01).
  - <range> = Last NPC in a continuous range. Extra ampersand [&] needed for hierarchical.
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 ICI.
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-EQPT: :MC;** to remove the MC from service.
  12. Replace the ICI 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**

# 2.5

---

### **When to Use**

Use this set of procedures to review and if required, set the time-clock utilities and the facility report utilities.

---

### **Related Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## **Instructions**

---

### **Tasks**

Complete the following steps to review/set the time-clock utilities and the facility report utilities.

| <b>Step</b> | <b>Action</b>                                                   | <b>Reference</b>       |
|-------------|-----------------------------------------------------------------|------------------------|
| 1           | Check and set time-clock utilities.                             | SE 2.5.1    page 2.5-3 |
| 2           | Check and set facility report utilities and auto backup memory. | SE 2.5.2    page 2.5-4 |

---

---

## SE 2.5.1: Check and Set Time-Clock Utilities

---

### Procedure

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  
**ED-DATE: : : , 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

**ED-DATE: : : mo-da-[ce]yr:[INT-bb] ;**

Where:

yr = Last 2 digits of year (00 through 99).  
mo = Month (01 through 12).  
[ce] = Century.  
da = Day (01 through 31).  
INT-bb = Optional, to set period (bb=01,02,04,06,08,12, or 24 hours).

---

---

## SE 2.5.2: Check and Set Facility Report Utilities and Auto Backup Memory

---

### Procedure

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.)

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



#### NOTE:

To see what facility reports are scheduled to occur enter  
**RTRV-PMREPT-SCHED:::CFA;**

2. To set the time for the facility report enter  
**SCHED-PMREPT-ALL:::hr-mn-sc,CFA;** Proceed to Step 6.
3. Familiarize yourself with the command (shown below) to set the time for facility report and select parameters.

For Gateway, both FAC and PRIM parameters must be entered, and common bits (for example, ERS) must be set the same in both.

**SCHED-PMREPT-ALL:::hr-mn-sc,FAC-X-abcdef[,PRIM-X-abcd];**

Where:

FAC-X-abcdef = Field to select DS1 facility reports; "abcdef" is hexadecimal word for 24 bits that specify parameters.

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

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

---

## Check and Change Line Buildout, Equalizers, and Impedance

# 2.6

---

### When to Use

Use this set of procedures to check and change line buildout, equalizers, and impedance.

---

### Related Information

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## Instructions

### Task

| Step | Action                                        | Reference           |
|------|-----------------------------------------------|---------------------|
| 1    | Check DS3 line buildout.                      | SE 2.6.1 page 2.6-3 |
| 2    | Change incorrect values of DS3 line buildout. | SE 2.6.2 page 2.6-4 |
| 3    | Check DS1 equalizer.                          | SE 2.6.3 page 2.6-5 |
| 4    | Change DS1 equalizer.                         | SE 2.6.4 page 2.6-6 |
| 5    | Check impedance setting.                      | SE 2.6.5 page 2.6-7 |
| 6    | Change 2.048-Mb/s impedance setting.          | SE 2.6.6 page 2.6-8 |

## SE 2.6.1: Check DS3 Line Buildout

### Procedure

Use this procedure to check the DS3 line buildout (LBO).

1. Enter **RTRV-PRMTR-T3:::LBO;**.
2. For each equipped DS3U (or HDS3U), read the LBO value (ON/OFF) for each DS3 position from the output message. Unequipped DS3 positions will have dashes for the LBOs. If there are no DS3s positions in the frame, the output will say LBO NONE.
3. Compare the settings with the required values per Table 2.6-1.
  - If Table 2.6-1 indicates an incorrect setting, proceed to *Change DS3 Line Buildout* to change the LBO setting.

**Table 2.6-1. DS3 Line Buildout**

| LBO<br>SETTING | TO DSX-3              |                 | TO NETWORK ELEMENT    |                 |
|----------------|-----------------------|-----------------|-----------------------|-----------------|
|                | KS-19224,<br>L2 CABLE | 734A CABLE      | KS-19224,<br>L2 CABLE | 734A CABLE      |
| ON             | 0 to 75 feet          | 0 to 225 feet   | 0 to 150 feet         | 0 to 450 feet   |
| OFF            | 75 to 150 feet        | 225 to 450 feet | 150 to 300 feet       | 450 to 900 feet |

---

## **SE 2.6.2: Change DS3 Line Buildout**

---

### **Procedure**

Use this procedure to change incorrect values of DS3 line buildout.

1. Enter

**ED-PRMTR-T3::UNIT-[q]q::DS3-c[&&-d]:,LBO-{ON|OFF};**

Where:

c = DS3 number associated with MXR (or HMXR) (1 through 6).

d = Optional, last DS3 number of range of DS3s in same unit.

ON|OFF = To change the line buildout on or off, OFF is default.

2. Check output message to verify command entries.
-



## SE 2.6.3: Check DS1 Equalizer

### Procedure

Use this procedure to check the DS1 equalizer setting.

1. For each equipped FTU/IFTU and FTM shelf, enter the following command:

**RTRV-STATE-EQPT: :UNIT-[q]q: :FTMI-b;**

Where:

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

b = FTMI (and shelf) number (1 through 4) in unit.

2. For DS1 shelf, compare the left and right shelf values (1 through 5) to the required settings for the length of office cabling per Table 2.6-2.
  - If the value per Table 2.6-2 indicates an incorrect setting, proceed to *Change DS1 Equalizer* to change the DS1 equalizer setting.

**Table 2.6-2. DS1 Equalizer Settings**

| Setting | Cable Length (22 Gauge) | Cable Length (26 Gauge) |
|---------|-------------------------|-------------------------|
| 1       | 0 through 133 feet      | 0 through 90 feet       |
| 2       | 133 through 267 feet    | 90 through 180 feet     |
| 3       | 267 through 400 feet    | 180 through 270 feet    |
| 4       | 400 through 533 feet    | 270 through 360 feet    |
| 5       | 533 through 655 feet    | 360 through 450 feet    |

---

## SE 2.6.4: Change DS1 Equalizer

---

### Procedure

Use this procedure to change the DS1 equalizer.

1. Enter the command with the value of equalization (or a dash for unchanged) for each half of the shelf (see Table 2.6-2):

**ED-PRMTR-EQPT::UNIT-[q]q:FTMI-b:EQL-l,r;**

Where:

- b = FTMI (and shelf) number (1 through 4).
- l = Equalizer setting (1 through 5) for left half of shelf (20 NPC positions).
- r = Equalizer setting (1 through 5) for right half of shelf (20 NPC positions).

2. Check output message to verify command entries.
-

---

## SE 2.6.5: Check Impedance Setting

---

### Procedure

Use this procedure to check the impedance setting.

1. For each equipped FTU/IFTU and FTM shelf, enter  
**RTRV-STATE-EQPT: :UNIT-[q]q: :FTMI-b;**

Where:

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

b = FTMI (and shelf) number (1 through 4) in unit.

2. For 2.048 Mb/s-shelf, check the impedance setting with the type of facility as follows: 075 ohms for coaxial cable, and 120 ohms for twisted wire cable.
  - If any settings need to be changed, continue with Step 3 (see Note.)



#### NOTE:

This procedure must be repeated to check all other units (including different type units that have not been checked) in the frame.

3. If you want to enter commands to change settings instead of referring the trouble to the installation group, proceed to *Change 2.048-Mb/s Impedance Setting*.
    - If you do not want to change the settings yourself, refer all incorrect settings to the installation group.
-

## **SE 2.6.6: Change 2.048-Mb/s Impedance Setting**

---

### **Procedure**

Use this procedure to change the 2.048-Mb/s impedance setting.

1. Enter **RMV-EQPT : :UNIT - [q]q : FTMI - b**; for the unit and FTMI shelf to be changed.

Where:

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

b = FTMI (and shelf) number (1 through 4).

2. Enter **DISC-EQPT : :UNIT - [q]q : FTMI - b**; for the same unit and shelf.



#### **NOTE:**

The FCs will be autonomously removed when the FTMI is degrown.

3. Enter command to grow the FTMI with the required impedance setting: **CRTE-EQPT : :UNIT - [q]q : FTMI - b : IMP - zzz**;

Where:

zzz = For 2.048-Mb/s line; use 075 for 75-ohm coaxial or 120 for 120-ohm twisted pair.

4. Enter **RST-EQPT : :UNIT - [q]q : FTMI - b**; for the unit and FTMI.

- If the command is denied, find the reason for denial in the output message and perform corrective action to obtain command completion.

5. Enter **RST-EQPT : :UNIT - [q]q : FC - sb**; ( to restore the FCs that were removed from service when the FTMI was degrown.

Where:

s = Side number (0 or 1).

b = Format converter number (1 through 4).

6. Check output message to verify command entries.
-

---

## Test DS3U or HDS3U Protection Switching

# 2.7

---

|                    |                                                                        |
|--------------------|------------------------------------------------------------------------|
| <b>When to Use</b> | Use this set of procedures to test DS3U or HDS3U protection switching. |
|--------------------|------------------------------------------------------------------------|

---

|                                |                                                                            |
|--------------------------------|----------------------------------------------------------------------------|
| <b>Related<br/>Information</b> | For related information, refer to Volume I, Chapter 2, <i>Acceptance</i> . |
|--------------------------------|----------------------------------------------------------------------------|

---

## Instructions

---

### Task

| Step | Action                                   | Reference           |
|------|------------------------------------------|---------------------|
| 1    | Check multiplexer protection switching.  | SE 2.7.1 page 2.7-3 |
| 2    | Check facility line interface switching. | SE 2.7.2 page 2.7-5 |

---

## SE 2.7.1: Check Multiplexer Protection Switching

### Procedure

Use this procedure to verify that the multiplexer units have the ability to switch from the service unit to the protection unit and back.

1. Enter command to initiate the MMFG protection switch as follows:  
**SW-TOPROTN-EQPT : :UNIT- [q]q : :MMFG-c [ :FRC ] ;**. Option FRC forces the switch even if it means releasing protection connected to another service MMFG.

Where:

- [q]q = Unit number (1 through 16).
- c = MMFG number (1 through 6) to be switched.
- FRC = Optional, to force removal without accompanying protectionswitching (required when protection switching is not available).



#### NOTE:

The switch can also be initiated by pulling a service MXR (HMXR) pack or entering the MMFG remove command:

**RMV-EQPT : :UNIT- [q]q : :MMFG-c ;**.

2. Notice the SW ...COMPLD message and verify that ALM message is not received on a line which has been switched onto protection.
3. Enter **RTRV-STATE-EQPT : :UNIT- [q]q : :PROTN ;** to see the overall protection state for the unit.
4. Observe the following in the query output message:
  - The message is divided into the top half for the FLI status and the bottom half for the MMFG status.
  - In the FLI portion, the maintenance status and then the protection are listed for both the service and protection FLIs.
  - In the MMFG portion, there are 7 MMFG groupings; the leftmost is for the protection MMFG and the others are for MMFGs 1 through 6. In each grouping, the first item is the MXR/EMXR/HMXR maintenance status, followed by the MIU maintenance status (MIU is not supported but EMIU is supported), followed by the protection status, followed by the availability of switching (if MMFG switching was requested).
5. Enter  
**RTRV-STATE-T3 : :UNIT- [q]q : :DS3-c ;** for same unit and MMFG (c = MMFG No.) to obtain PSTATE summary.

6. Enter command for manual switchback as follows:  
**SW-TOWKG-EQPT: :UNIT- [q]q: :MMFG-c;** for the MMFG that was switched.

**NOTE:**

If switch was initiated by pulling a pack or removing the MMFG, do the reverse operation (install, restore) here to cause switchback.

7. If you want to compare the status to the switched status, enter  
**RTRV-STATE-EQPT: :UNIT- [q]q: :PROTN;** and read status as before.
    - If this procedure has been completed, continue to *Check Facility Line Interface Switching* to check facility line interface protection switching.
-



---

## SE 2.7.2: Check Facility Line Interface Switching

---

### Procedure

Use this procedure to verify that the FLI (facility line interface) units have the ability to switch from the service unit to the protection unit and back.

1. If you want to test the FLI switching, enter  
**SW-TOPTN-EQPT::UNIT-[q]q::FLI;**
  2. After completion, enter  
**RTRV-STATE-EQPT::UNIT-[q]q::PTN;** to read the status as before.
  3. To switch back the FLI, enter  
**SW-TOWKG-EQPT::UNIT-[q]q::FLI;.**
-



---

**When to Use**

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

---

**Related  
Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

---

## Instructions

---

### Procedure

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

1. Enter **RTRV-STATE-EQPT: :SYNC;** to determine the active sync side which is given by SOURCE field (inactive side will show MATE).
  2. To switch over, remove the active side from service.  
Enter **RMV-EQPT: :SYNC-a;**.
  3. Repeat step 1 to obtain STATE SYNC again and check SOURCE field. The other sync unit should be active.
  4. Enter **RST-EQPT: :SYNC-a;** to restore the side removed from service.
  5. To switch back to the original sync unit, repeat step 1 to obtain STATE SYNC again and check SOURCE field. The active sync side is given by the SOURCE field.
  6. To switch over, remove the active side from service.  
Enter **RMV-EQPT: :SYNC-a;**.
  7. Repeat step 1 to obtain STATE SYNC again and check SOURCE field. The original sync unit should be active.
  8. Enter **RST-EQPT: :SYNC-a;** to restore the side removed from service.
-

---

## Check Cross-Connect Operation using a Digital Access Test Set

# 2.9

---

|                    |                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to check the operation of the cross-connect network using a Digital Access Test Set (DATS). |
|--------------------|----------------------------------------------------------------------------------------------------------------|

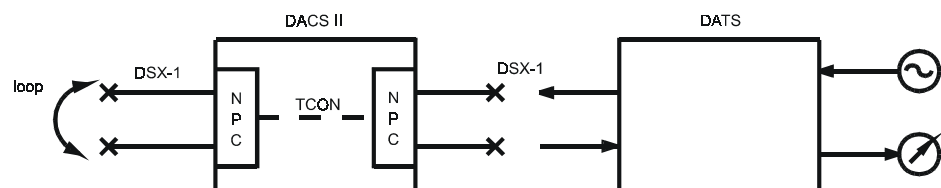
---

|                            |                                                                            |
|----------------------------|----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 2, <i>Acceptance</i> . |
|----------------------------|----------------------------------------------------------------------------|

---

### Diagram of Cross-Connection Using DATS

Use Figure 2.9-1 to connect the DATS to the first NPC to be tested.



---

**Figure 2.9-1. Cross-Connection Using DATS**

## Instructions

Use this procedure to check the operation of the cross-connect network using a Digital Access Test Set.

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

**CRTE-EQPT::NPC-<npc No.>::DE100;**

2. Verify that TG80(B) plug-ins are installed in the test NPC positions.
3. Enter **RST-EQPT::NPC-<npc No.>;** to restore the test NPCs.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).



**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 DSX-1 bay jacks.

4. At DSX-1, do steps 5 through 9.
5. Get J1C140A DATS and connect to 120 V AC outlet.
6. Turn power on and enter C-C-F-O-D on DATS keypad.
7. At back of DATS, connect 474A plug end of P6AA cord to DS1 IN/OUT jack.
8. Connect other end of cord to first NPC to be tested with red 310 plug to OUT jack (plug orientation is not critical).
9. Verify that other NPC to be entered in cross-connect command has cord between IN and OUT jacks to loop the NPC signal.
10. Compare the list of settings (E1,FE,E5,EC,F2,C2, and A01 for test channel 01) to what is lighted on the DATS. Select any that are not already set by entering the command letter followed by "D" (for do it).
11. Enter **CONN-CRS-T0::<npc No.1>-ddd,<npc No.2>-jjj:TRSP;** 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, 01-1-01).

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 **12**.
- If tone is not heard at DATS, verify test connections and DATS settings.
- If the command is denied, find the reason for denial in the output message and perform corrective action to obtain completion.

12. Remove cross-connection as follows:

**DISC-CRS-T0::<npc No.1>-ddd,<npc No.2>-jjj;.**

13. Repeat test as necessary to include different DACS II units by moving connections to different NPCs (grown and restored). Enter the CONN CRS T0 command to make the cross-connection.
14. 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 General Tasks*.)
-





---

## Check Cross-Connect Operation using an Unassigned Voice Terminal

# 2.10

---

### When to Use

Use this set of procedures to check the operation of the cross-connect network using an unassigned voice terminal.

---

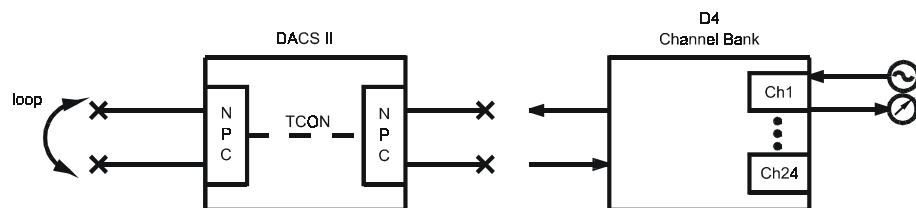
### Related Information

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

### Diagram of Cross-Connection Using an Unassigned Voice Terminal

Figure 2.10-1 shows cross-connection using an unassigned voice terminal.



---

**Figure 2.10-1. Cross-Connection Using Unassigned Voice Terminal**

## Instructions

Use this procedure to check the operation of the cross-connect network using an unassigned voice terminal.

1. Enter commands as follows to grow two NPCs, one which will have signal looped at DSX-1 bay and one to an unassigned voice terminal: **CRTE-EQPT::NPC-<npc No.>::DE100;**
2. Verify that TG80(B) plug-ins are installed in the test NPC positions.
3. Enter **RST-EQPT::NPC-<npc No.>;** to restore the test NPCs.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).



**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 DSX-1 bay jacks.

4. At DSX-1, do the following:
  - Patch unassigned channel bank (for example, D4 channel bank which is equipped with the proper plug-in units) 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.
6. Enter **CONN-CRS-T0::<npc No.1>-ddd,<npc No.2>-jjj:TRSP;** at DACS II to cross-connect any channel from one test NPC to the other looped NPC.

Where:

ddd = Any channel (1 through 24) on first NPC for test.

jjj = Any channel (1 through 24) 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.
7. To remove cross-connection, enter **DISC-CRS-T0::<npc No.1>-ddd,<npc No.2>-jjj;**

8. Repeat test as necessary to include different DACS II units by moving connections to different NPCs (grown and restored). Enter the CONN CRS T0 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**

# 2.11

---

**When to Use**

Use this set of procedures to check the operation of the cross-connect network using a digital access test set and an unassigned voice terminal.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 2, *Acceptance*.

---

## Instructions

Use this procedure to check for equipped circuit packs, out-of-service circuits 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

**RTRV-STATE-EQPT::[{UNIT-[q]q|UNIT|ETSI| TSI|NPC|MXR}]::EQPD;**

Where:

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

See Figure 2.11-1 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 RTRV STATE EQPT ... COMPLD

"<subject>:g,h,i,j,k,l,m,n,o,p"

g = Link 1  
h = Link 2  
i = Link 3  
j = Link 4  
k = Link 5  
l = Link 6  
f = Link 7  
m = Cross-Connect Side 0  
n = Cross-Connect Side 1  
o = CCI 0 / CCNI 0  
p = CCI 1 / CCNI 1

---

**Figure 2.11-1. Common Equipment Readout**

### Check for Out-of-Service Circuit Packs

2. Check for out-of-service circuit packs by entering  
**RTRV-STATE-EQPT::[UNIT-[q]q]::OOS;**

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-EQPT** (restore) command for the pack if it should be in-service, or
  - the **DISC-EQPT** (degrow) command for the pack if acceptance testing is complete.

### 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:
  - **RTRV-CRS-T1::<npc No.>[&&[-]<range>]::MAP;** shows the connections on a single NPC or range of NPCs.

Where: <range> = Optional, last NPC of a continuous range. Extra ampersand and dash [&-] is needed if hierarchical.



- **RTRV-CRS-T1::NPC::MAP;** 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 a Frame                              | GT 3.1-1  |
| ■ Installing Synchronizers                          | GT 3.2-1  |
| ■ Query Sync Status                                 | GT 3.3-1  |
| ■ Add/Change Synchronizer Timing Link Interface     | GT 3.4-1  |
| ■ Change Synchronizer Timing Base Stratum           | GT 3.5-1  |
| ■ Install ECCN Circuit Packs                        | GT 3.6-1  |
| ■ Install Multibay CCN Circuit Packs                | GT 3.7-1  |
| ■ Install Single-Bay CCN Circuit Packs              | GT 3.8-1  |
| ■ Install CEF Power Units and Fuses                 | GT 3.9-1  |
| ■ Install Multibay Power Units and Fuses            | GT 3.10-1 |
| ■ Install Single-Bay Power Units and Fuses          | GT 3.11-1 |
| ■ Remove and Degrow ECCN/CCN                        | GT 3.12-1 |
| ■ Install Plugs-Ins, Grow and Restore FTU/IFTU      | GT 3.13-1 |
| ■ Remove and Degrow IFTU/FTU                        | GT 3.14-1 |
| ■ Provision Common Equipment                        | GT 3.15-1 |
| ■ Provision Protection MMFG                         | GT 3.16-1 |
| ■ Activate/Deactivate DS3 Unprotected Service Alarm | GT 3.17-1 |
| ■ Remove and Degrow DS3U or HDS3U                   | GT 3.18-1 |

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|                                                                                                    |           |
|----------------------------------------------------------------------------------------------------|-----------|
| ■ Provision DSPU                                                                                   | GT 3.19-1 |
| ■ Remove and Degrow DSPU                                                                           | GT 3.20-1 |
| ■ Change DS1/DS3/HDS3 Parameters                                                                   | GT 3.21-1 |
| ■ Set Optional Alarm Threshold in Data Base                                                        | GT 3.22-1 |
| ■ Install Circuit Packs and Grow Type DE NPC<br>(IFTU2 NPC without SLC Carrier)                    | GT 3.23-1 |
| ■ Install Circuit Packs and Grow Type DA NPC<br>(IFTU2 NPC without SLC Carrier)                    | GT 3.24-1 |
| ■ Provision DSP Platform NPC                                                                       | GT 3.25-1 |
| ■ Grow Type DS NPC (IFTU2 NPC with SLC Carrier)                                                    | GT 3.26-1 |
| ■ Grow Type DS3U or HDS3U NPC                                                                      | GT 3.27-1 |
| ■ Install, Grow Circuit Packs and Restore DSPU NPC                                                 | GT 3.28-1 |
| ■ Change Subrate Hub ID                                                                            | GT 3.29-1 |
| ■ Change NPC Type, IW, or ALMOPT-AIS                                                               | GT 3.30-1 |
| ■ Change Alarm Threshold                                                                           | GT 3.31-1 |
| ■ Change Subrate ECLOC                                                                             | GT 3.32-1 |
| ■ Query or Change TS0 Bit Monitoring                                                               | GT 3.33-1 |
| ■ Remove and Degrow NPC                                                                            | GT 3.34-1 |
| ■ Establish DS1 Facility (without SLC Carrier)                                                     | GT 3.35-1 |
| ■ Establish SLC 96 Carrier System Mode I or SLC<br>Series 5 Carrier System FPB (Feature Package B) | GT 3.36-1 |
| ■ Establish SLC 96 Carrier System Mode III                                                         | GT 3.37-1 |
| ■ Establish New SLC Series 5 Carrier System<br>Feature Package C (FPC)                             | GT 3.38-1 |
| ■ Establish Retrofit SLC Series 5 Carrier System<br>Feature Package C (FPC)                        | GT 3.39-1 |
| ■ Make DSX-1 Connections                                                                           | GT 3.40-1 |
| ■ Reinitialize the CIU for Use (SLC Series 5 Carrier)                                              | GT 3.41-1 |
| ■ Add Protection Switching (Existing System)                                                       | GT 3.42-1 |
| ■ Retrofit SLC Mode I, 5:5 to 5:4                                                                  | GT 3.43-1 |
| ■ Delete Digroup Designation                                                                       | GT 3.44-1 |
| ■ Change Far-End Bank Identifier                                                                   | GT 3.45-1 |
| ■ Change State of the SLC Series 5 RT Bank                                                         | GT 3.46-1 |

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(Continued on next page)

|                                                                          |           |
|--------------------------------------------------------------------------|-----------|
| ■ Change Power/Miscellaneous Alarm Designation                           | GT 3.47-1 |
| ■ Operate SLC Carrier System Protection Switch or<br>Line Loopback       | GT 3.48-1 |
| ■ Establish DS3 Facility                                                 | GT 3.49-1 |
| ■ Establish Subrate Channel                                              | GT 3.50-1 |
| ■ Change Established Subrate Channel                                     | GT 3.51-1 |
| ■ Disestablish Subrate Channel                                           | GT 3.52-1 |
| ■ Provisioning Links                                                     | GT 3.53-1 |
| ■ Establish IP Address for the ICI Circuit Pack                          | GT 3.54-1 |
| ■ Establish Telnet Session to the TCP/IP Link on<br>the ICI Circuit Pack | GT 3.55-1 |

---



---

**When to Use**

Use this procedure to do the following:

- Configure the frame by entering bay configuration information into the database.
- Grow a Frame ID.

---

**Before You Begin**

When configuring the frame, note the following:

- 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.
- 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.

---

**Related Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Tasks

| Step | Action           | Reference                       |
|------|------------------|---------------------------------|
| 1    | Configure frame. | SE 3.1.1 <i>Configure Frame</i> |
| 2    | Grow Frame ID.   | SE 3.1.2 <i>Grow Frame ID</i>   |

---



### SE 3.1.1: Configure Frame

#### Procedure

Use this procedure to configure the frame:

1. Log in on link 1 as user DAX (refer to Chapter 6, *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 **RTRV-PRVG-{USER|TERM}:::ALL;** 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 **SET-PRVG-TERM:::ALL::NPCAD-H;** to temporarily change all users and links to the hierarchical addressing scheme.

3. Enter **CPY-MEM:::WKG, MEM;** to ensure that any recent frame activities are recorded on the primary memory card.
4. At link 1, enter **RST-EQPT::MC::MCOND;** to place the frame in the maintenance condition which limits the frame activity to maintenance commands.
5. To initiate the routine, enter **INIT-SYS::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.
12. Answer the question about the number of bays and answer the question about bay 1.
13. Continue with the questions to number all the bays in the frame.

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 **ED-PRMTR-NE**, 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 COMPLD** message is received, enter **RST-EQPT : :MC**; to exit the MCOND state. (See Note.) The procedure to configure the frame has been completed.
  - If denial message is received, continue with Step 19.

**NOTE:**

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

**NOTE:**

The user can now re-establish specific users and links to the 4 digit extended addressing scheme by entering the following command  
**SET-PRVG-{USER|TERM}:::{<user id>|j[mm]}:NPCAD-X;**

19. Which denial explanation is received?
  - If **PMEM error** proceed to Step 21.
  - If **cannot lock/unlock database**, proceed to Step 22.
  - If **entity cannot be addressed**, continue with Step 20.
  - If **checksum verification**, proceed to Step 23.
20. The configuration routine was aborted before the entire routine was completed. Enter **RTRV-PRMTR-NE**;

- If pertinent information was not included, repeat the procedure from Step 5.
  - If pertinent information has been entered, enter **RST-EQPT : :MC**; to exit the MCOND state. The procedure to configure the frame has been completed.
21. Enter **RST-EQPT : :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-EQPT : :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-EQPT : :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 . . .COMPLD** (with no COND) is received, repeat the procedure to configure the frame.
  - If **RESET . . .COMPLD** (with COND) is received, refer to *Data Base Troubles* in Volume II to clear reset trouble.
-

---

## SE 3.1.2: Grow Frame ID

---

### Procedure

Use this procedure to grow a unique Frame ID for the frame.

The frame growth command performs the following:

- Places a nonzero frame number and optional unique identifier into the data base
- Enables the use of a 3-character frame field (if developed)
- Grows virtual NPCs [9]961 (and others) as TYPE VI100 for network broadcast connections.

1. Enter the frame growth command as follows:

**ED-PRMTR-NE:::abc123...[, FRAME-fg]:[CHAR-n];**

Where:

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

fg = Two-digit, alphanumeric frame number (00 through ZZ).  
This number is not used in MML, but it can be entered for alternative PDS use.

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

- If command COMPLD message is received, the procedure to grow the frame ID has been completed.
  - If "frame number is protected" explanation 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 **INIT-SYS::FRAME;** command per *SE 3.1.1 Configure Frame*.
-



---

**When to Use**

Use this set of procedures to do the following:

- Install synchronizer circuit packs.
- Check NPC timing option wiring.
- Grow sync timebase, configure sync mode, and restore sync.
- Grow and restore TLIs.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                                     | Reference                                                                  |
|------|------------------------------------------------------------|----------------------------------------------------------------------------|
| 1    | Install synchronizer circuit packs.                        | SE 3.2.1, <i>Install Synchronizer Circuit Packs</i>                        |
| 2    | Check NPC timing option wiring.                            | SE 3.2.2, <i>Check NPC Timing Option Wiring</i>                            |
| 3    | Grow sync timebase, configure sync mode, and restore sync. | SE 3.2.3, <i>Grow Sync Timebase, Configure Sync Mode, and Restore Sync</i> |
| 4    | Grow and restore sync TLIs.                                | SE 3.2.4, <i>Grow and Restore Sync TLIs</i>                                |

---



## SE 3.2.1: Install Synchronizer Circuit Packs

### Procedure

Use this procedure to install synchronizer circuit packs.

**NOTE:**

The only way to switch SYNC sides is to issue a **RMV-EQPT : : SYNC** command followed by a **RST-EQPT : : 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.
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).
4. Install the OSPU and SPU (synchronizer power unit) (TG58).
5. Check and install TLI (timing link interface) type designations.
6. Verify that there are duplicate TLI cards (on sides 0 and 1) for each incoming and timing distribution link.
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.

## SE 3.2.2: Check NPC Timing Option Wiring

### Procedure

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 |
|------------------------|--------------------|
| 01-1-30                | 030                |
| 01-1-32                | 032                |
| 01-2-30                | 070                |
| 01-2-32                | 072                |
| 02-1-30                | 190                |
| 02-1-32                | 192                |
| 02-2-30                | 230                |
| 02-2-32                | 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.

### SE 3.2.3: Grow Sync Timebase, Configure Sync Mode, and Restore Sync

#### Procedure

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 *SE 3.2.4, Grow and Restore Sync TLIs*.

1. Enter **CRTE-EQPT::SYNC::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 **ED-PRMTR-EQPT::SYNC::MASTER**;
5. Enter **RST-EQPT::SYNC-0**; and then **RST-EQPT::SYNC-1**;
6. Enter **CRTE-EQPT::SYNC::TLI-1: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 **CRTE-EQPT::SYNC::TBpqr:TLI-3**; to grow additional TB (same stratum as others) for use as clock reference oscillator.
8. Enter **RST-EQPT::SYNC-0::TLI-1**; and **RST-EQPT::SYNC-1::TLI-1**; to restore TLI 1 on both sides.
9. Wait 30 minutes for the timebase to warm up, then enter **RST-EQPT::TLI-3::CRO**; to restore TLI 3.  
 The procedure to configure the sync for MASTER mode has been completed.
10. Enter **ED-PRMTR-EQPT::SYNC::SLAVED**;

11. Enter **RST-EQPT::SYNC-0;** and then **RST-EQPT::SYNC-1;**.
-

## SE 3.2.4: Grow and Restore Sync TLIs

### Procedure

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 (TE 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  
**CRTE-EQPT::SYNC::TLI-n:tez,SSP-0,SRC-p\  
 [,NPC-<npc No.>];**  
 Where:
  - n = TLI number (1 through 4).
  - te = TE for code TG64 card; 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.
  - 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-EQPT::SYNC-0::TLI-n:SSP-0;** and then  
**RST-EQPT::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.

Enter **CRTE-EQPT::SYNC::TLI-n: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).

7. Enter **RST-EQPT::SYNC-0::TLI-n**; and then  
**RST-EQPT::SYNC-1::TLI-n**;
8. Repeat Steps 7 and 8 as needed to grow and restore other timing distributor TLIs.
9. Enter **RTRV-STATE-COM:::ALL**; to check the source priority.
10. Enter **RTRV-STATE-EQPT::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.

---

**When to Use**

Use this procedure to query the sync status.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

---

## Instructions

---

Use this procedure to query the sync status.

1. Enter **RTRV-STATE-EQPT::SYNC;** and read the sync configuration and status.
2. Enter **RTRV-REG-EQPT::SYNC-a::STR;** 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).

3. 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.
-



```
/*STR:b01,b02,b03,b04,b05,b06*/
"STR:byte1,byte2,byte3,byte4,byte5,byte6"
```

**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**

| <b>SOURCE (BITS ab)</b> |   | <b>ACTIVE PORT (BITS cde)<br/>(if BITS ab = 01)</b> |                    |
|-------------------------|---|-----------------------------------------------------|--------------------|
| 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 | fgh | = | 000 for stratum 3, 001 for 2-Mb/s local |
|   |   | (master mode)       |     |   | 010 for 2-Mb/s toll, 011 for stratum 2  |

**Figure 3.3-1. Sync Status Register**



---

## Add/Change Synchronizer Timing Link Interface

# 3.4

---

### When to Use

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.

---

### Before You Begin



#### CAUTION:

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

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to add or change the synchronizer timing link interface.

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. 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

01-1-30, 01-1-32, 01-2-30, 01-2-32, 02-1-30, 02-1-32, 02-2-30, and 02-2-32.

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 **CRTE-EQPT::SYNC::\TLI-n:tepqr,SSP-a,SRC-p[,NPC-<npc No.>];**

Where:

- n = TLI number (1 through 4).
- tepqr = Input signal type.
- 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, 01-1-30). Only appropriate with TLI type TU.

6. To restore sync port 0 in the TLIs in both syncs, enter

**RST-EQPT::SYNC-0::TLI-n:SSP-0;** and  
**RST-EQPT::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.
10. Enter **RTRV-STATE-EQPT: :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.

11. For additional sync information, enter the appropriate command and read the registers:
  - For SYNC: **RTRV-REG-EQPT: :SYNC-a: :STR;** .
  - For TLI: **RTRV-REG-EQPT: :SYNC-a: :TLI-n:STR;**
  - For SSP: **RTRV-REG-EQPT: :SYNC-a: :TLI-n:SSP-s:STR;**

The procedure to add the synchronizer timing link interface has been completed.
12. Enter the **RTRV** 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-EQPT: :SYNC-0: :TLI-n:SSP-0;** and **RMV-EQPT: :SYNC-1: :TLI-n:SSP-0;**.

**Table 3.4-1. Sync Status Output**

| Message Field | Outputs and Meanings                                                   |
|---------------|------------------------------------------------------------------------|
| CFR           | MASTER or SLAVED sync configuration.                                   |
| STRATUM       | STR2, STR3, CEPT TOLL, or CEPT LOCAL.                                  |
| MODE          | HOLDOVER, FAST, or NORMAL for each DPLL.                               |
| SOURCE        | Source for sync DPLL (HOLDOVER, TLI, or CRO; other side will be MATE). |

**Table 3.4-1. Sync Status Output (Continued)**

| Message Field    | Outputs and Meanings                                                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 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  
**ED-PRMTR-EQPT::SYNC::TLI-n:SSP-b:\**  
**{tepqr|NPC-<npc No.>};**
17. Enter **ED-PRMTR-EQPT::SYNC::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.
18. To restore sync port 0 on the subject TLI in both syncs, enter  
**RST-EQPT::SYNC-0::TLI-n:SSP-0;** and  
**RST-EQPT::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**.

---

## Change Synchronizer Timing Base Stratum

# 3.5

---

### When to Use

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.

---

### Before You Begin

**CAUTION:**

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

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to change the synchronizer timing base stratum.

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.

**RTRV-STATE-EQPT::SYNC;** and **RTRV-REG-EQPT::SYNC-a::STR;**

Where: a = Side 0 or 1.

2. Enter **RMV-EQPT::SYNC-a;** to remove the inactive sync side.
3. Enter **RMV-EQPT::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 **DISC-EQPT::SYNC::TB;** to degrow sync time base.
6. Replace TB pack for same side with code (TG60-TG63) for required stratum.
7. Enter **CRTE-EQPT::SYNC::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. DGNDT messages (test number 312) will occur because of this difference, but the situation will be corrected and the DGNDT will cease when this procedure is completed.

8. Enter **ED-PRMTR-EQPT::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 **ED-PRMTR-EQPT::SYNC::<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-EQPT::SYNC-a**; to restore sync side.

**NOTE:**

A conditional command completion 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-EQPT::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 **DISC-EQPT::SYNC::TLI-3**; to degrow the additional TB.
15. Enter **CRTE-EQPT::SYNC::TBpqr:TLI-3**; 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-EQPT::SYNC::TLI-3::CRO**;

17. Reinstall the FC packs in their slots and enter **RST-EQPT::UNIT-[q]q::FC-sb;** to restore each one.
18. Verify that each one restored correctly.
19. Enter **RMV-EQPT::SYNC-a;** to remove other sync side.
20. Enter **RMV-EQPT::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.

**NOTE:**

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-EQPT::SYNC-a;**.
  24. Reinstall the FC packs in their slots and enter **RST-EQPT::UNIT-[q]q::FC-sb;** to restore each one.
  25. Enter **RTRV-STATE-EQPT::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.
-

---

**When to Use** Use this set of procedures to install circuit packs in an ECCN.

---

**Before You Begin** Before installing circuit packs, review these guidelines:

- 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.

---

**Related Information** For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to 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.
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).
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).
4. Enter **RTRV-REG-EQPT::XC-a::STR**; 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-EQPT::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.
7. Enter **RST-EQPT::CCI-s**; to restore the CCI for the inactive side to service.  
Where: s = Same side.
8. Enter **SW-DX-EQPT::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-EQPT : :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 equipment 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-EQPT : :CCI-s**; to restore the CCI for the inactive side to service.

Where: s = Same side.

---



---

**When to Use**                      Use this set of procedures to install circuit packs in a multibay CCN.

---

**Before you begin**              Before installing circuit packs, review these guidelines:

- 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.

---

**Related Information**              For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to install multibay CCN circuit packs.

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

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

**NOTE:**

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 **RTRV-REG-EQPT: :XC-a: :STR**; 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 **RTRV-STATE-COM: : :ALL**; and verify that the inactive side is not failed because switching to a failed side will cause loss of service.
  7. Enter **SW-DX-EQPT: :XC-a;**  
Where a = Inactive side to cause side switch.
  8. Install the required CCBs and TSIs on the remaining side (now inactive).
-



---

**When to Use**

Use this procedure to install circuit packs in a single-bay CCN.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to install single-bay CCN circuit packs. ( This procedure contains core pds gen4 information only. )

1. Locate the CCN (cross-connect network) in the frame and notice the organization within the 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 **RTRV-REG-EQPT::XC-a::STR;** 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 **RTRV-STATE-COM:::ALL;** and verify that the inactive side is not failed because switching to a failed side will cause loss of service.
6. Enter **SW-DX-EQPT::XC-a;**  
Where a = Inactive side to cause side switch.
7. Install the required CCBs and TSIs on the remaining side (now inactive).

---

## Install CEF Power Units and Fuses

# 3.9

---

### When to Use

Use this procedure to install CEF power units and fuses.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to install CEF power units and fuses.

1. Locate the power unit slots for the section of the frame being equipped using shelf designation strips.
2. Determine whether the required codes and quantities of power units are installed.
3. Determine whether the required 48-volt input fuses are installed in the fuse and alarm panel (bottom frame).
4. Determine whether the fuses are installed in fuse boards per designation strips.
  - 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.
6. Install the required LED fuses.
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). The SPU (sync power unit) does not have test jacks to perform this test.
  - If the requirement is met, disconnect the meter.
  - If the requirement 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.

---

---

## **Install Multibay Power Units and Fuses**

# **3.10**

---

### **When to Use**

Use this procedure to install multibay power units and fuses.

---

### **Related Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to install multibay power units and fuses.

1. Locate the power unit slots for the section of the frame being equipped and the shelf designation strips.
2. Determine whether the required codes and quantities of power units are installed.
3. Determine whether the required 48-volt input fuses are installed in the fuse and alarm panel (bottom frame).
4. Determine whether the LED output fuses are installed in ED-2C863-30 DFBs (dual fuse boards).



**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.
  6. Install the required LED fuses.
  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 voltage range.
  10. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN. The SPU (sync power unit) does not have test jacks to perform this test.
    - If the requirement is met, disconnect the meter.
    - If the requirement is not met, replace the power unit.
-

---

## Install Single-Bay Power Units and Fuses

# 3.11

---

### When to Use

Use this procedure to install single-bay power units and fuses.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to install single-bay power units and fuses.

1. Locate the power unit slots for the section of the frame being equipped 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).
4. Determine whether the LED output fuses are installed in the ED-2C863-30 DFBs (dual fuse boards) per designation strips. 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.
6. Install the required LED fuses.
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 voltage range.
11. Measure each power unit output between the + and – V1 jacks (or between each V jack and RTN). The SPU (sync power unit) does not have test jacks to perform this test.
  - If the requirement is met, disconnect the meter.
  - If the requirement 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.

---



---

**When to Use**

Use this procedure 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.

---

**Related Information**

For additional information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to remove and degrow ECCN/CCN.

1. To list all plug-ins enter:

**RTRV-STATE-EQPT : : [UNIT- [q]q] : : EQPD ;**

To list common plug-ins (no NPCs) enter:

**RTRV-STATE-COM : : : EQPD ;**

After response enter **RTRV-STATE-EQPT : : [UNIT- [q]q] : : OOS ;**

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 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 CONN 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 DS3U FMTs (formatters) and 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-EQPT : : ETSIS, ECCN-s;** (for all ETSIs on Side s)

**RMV-EQPT : : ETSI-sqq;** (for individual ETSI)

**RMV-EQPT : : CCI-s;**

Where: qq = Unit Number 1 through 16.

**For CCN:**

**RMV-EQPT : : TSIS, CCN-s;** (for all TSIs on Side s)

**RMV-EQPT : : CCB-sf;**

**RMV-EQPT : : TSI-sft;** (for individual TSI)

**RMV-EQPT : : CCNI-s;**

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.

**DISC-EQPT : : 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.



---

## Install Plugs-Ins, Grow and Restore FTU/IFTU

# 3.13

---

**When to Use** Use this set of procedures to install plug-ins, and grow and restore the FTU/IFTU.

---

**Related  
Information** For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                     | Reference                                                             |
|------|--------------------------------------------|-----------------------------------------------------------------------|
| 1    | Install FTM circuit packs (FTMIs and FCs). | SE 3.13.1, <i>Install FTM Circuit Packs (FTMIs and FCs)</i>           |
| 2    | Grow FTU/IFTU.                             | SE 3.13.2, <i>Grow FTU/IFTU</i>                                       |
| 3    | Restore ECCN/CCN.                          | SE 3.13.3, <i>Restore ECCN</i><br>or<br>SE 3.13.4, <i>Restore CCN</i> |
| 4    | Restore UC.                                | SE 3.13.5, <i>Restore UC</i>                                          |
| 5    | Grow FTMI.                                 | SE 3.13.6, <i>Grow FTMI</i>                                           |
| 6    | Restore FTMI and FCs                       | SE 3.13.7, <i>Restore FTMI and FCs</i>                                |

---



### **SE 3.13.1: 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.
2. If not already installed, install the **TG81** code FTM and the **TG79** code of FCs (format converters) for the FTMs to be equipped.
3. If the circuit pack dual cards (for example, DDC) 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.

---

## SE 3.13.2: Grow FTU/IFTU

---

### Procedure

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 *SE 3.13.3, Restore ECCN* and *SE 3.13.4, Restore 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 **RTRV-PRMTR-NE**; (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the INIT-SYS 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 following command:  
**CRTE-CNFGRN-EQPT: :UNIT-[q]q:\**  
**[ :a[,b[,c[,d[,e[,f]]]]]] : [mnxyz];**

Where:

[q]q = Unit number (1 through 16).  
mn = Unit type; FT for DS1 FTU. Default is FT100.  
xyz = Variables that define type parameters.  
xyz = 100 unless different value is given in circuit order information.

3. Enter the command with the required information.
  4. Repeat the procedure for any other units to be grown.
-

---

### SE 3.13.3: Restore ECCN

---

1. If the CCI pack was just installed in a previous procedure, enter  
**RST-EQPT::CCI-s;**

Where:

**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-EQPT::ETSI, ECCN-s;**

Restore ETSIs individually - **RST-EQPT::ETSI-sqq;**

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

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

---

### SE 3.13.4: Restore CCN

#### Procedure

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-EQPT::CCNI-s;**

Where:

2. If a CCB was just installed in a previous procedure, enter **RST-EQPT::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-CNFRN-EQPT::UNIT-q::CCN-s  
[:a[,b[,c[,d[,e[,f]]]]]];**

Restore all the TSIs on a side (see Note)

**RST-EQPT::CCN-s,TSIS;**

Restore TSIs individually

**RST-EQPT::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)

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 = for example, TSI 013 is on Side 0 and receives data FROM unit 1 and connects TO unit 3.
-

---

## SE 3.13.5: Restore UC

---

### Procedure

Use this procedure to restore the UC.

1. Enter **RST-EQPT::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.

---

## SE 3.13.6: Grow FTMI

### Procedure

This procedure presents the command to grow the FTMI in the data base. This growth operation results in the associated FCs being grown also. If TYPE DE NPCs are going to be installed in the module for 1.544-Mb/s lines, the setting for the line signal equalizers in the transmit direction is entered here. If TYPE PB/PC PBCs are going to be installed in the module for 2.048-Mb/s lines, the impedance of the line interfaces, either 75-ohm coaxial or 120-ohm twisted wire, is entered here.

1. Which type (and line rate) NPCs will be installed in the module?
  - If **TYPE-PB/PC (2.048-Mb/s Line)**, continue with Step 2.
  - If **TYPE-DE (1.544-Mb/s Line)**, proceed to Step 5.
2. Do you want to enter the initial impedance setting or change the impedance (or change from equalization)?
  - If **INITIAL SETTING**, continue with Step 3.
  - If **CHANGE SETTING**, proceed to Step 8.
3. Enter **CRTE-EQPT::UNIT-[q]q::FTMI-d:IMP-zzz;**
4. Repeat the procedure for other FTMs to be grown. The procedure to grow the FTMI has been completed.
5. Obtain (or measure) the line cable length from the DACS II to the line-jack bay in order to select equalizer values at DACS II; there are 5 equalizer settings per Table 3.13-1.
6. Enter **CRTE-EQPT::UNIT-[q]q::FTMI-d:EQL-l,r;**

Where:

- [q]q = Unit number (1 through 16).
- d = FTM interface number (1 through 4).
- l = Equalizer setting (1 through 5) for left half of shelf (20 NPCs).
- r = Equalizer setting (1 through 5) for right half of shelf (20 NPCs).



#### NOTE:

Something must be entered for both halves even if the same value is used on both sides.

**⇒ NOTE:**  
FCs will also be grown.

**Table 3.13-1. DS1 (1.544 Mb/s) Equalizer Settings**

| Setting | Cable Length (22 Gauge) | Cable Length (26 Gauge) |
|---------|-------------------------|-------------------------|
| 1       | 0 through 133 feet      | 0 through 90 feet       |
| 2       | 133 through 267 feet    | 90 through 180 feet     |
| 3       | 267 through 400 feet    | 180 through 270 feet    |
| 4       | 400 through 533 feet    | 270 through 360 feet    |
| 5       | 533 through 655 feet    | 360 through 450 feet    |

7. Repeat the procedure for other FTMs to be grown. The procedure to grow the FTMI has been completed.
8. Enter commands to remove (see Note) and degrow any equipped NPCs in the module. The commands are:  
**RMV-EQPT::NPC-<npc No.>[&&[&]-<range>];**  
**DISC-EQPT::NPC-<npc No.>[&&[&]-<range>];**

Where:

- <npc No.> = NPC number, either extended (for example, 001) or hierarchical (for example, 01-1-01).
- <range> = Optional, to name the last NPC of range. Extra ampersand (&) required for hierarchical.

**⇒ NOTE:**  
It is unlikely that the NPCs are still in-service because different codes of NPCs and different facilities will be used.

**⇒ NOTE:**  
If the NPCs must still be removed from service, arrangements must be made with customers because the service on the channels of the NPCs will be interrupted.

9. Enter **RMV::UNIT-[q]q::FTMI-b;**

Where:

10. Enter **DISC-EQPT::UNIT-[q]q::FTMI-d;** to degrow the current FTMI and impedance from the data base.



11. Return to Step **3** to enter the new impedance value. The FTMI must also be restored to service after the impedance is changed and before NPCs can be added to service.
-

---

### SE 3.13.7: Restore FTMI and FCs

---

#### Procedure

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-EQPT::UNIT-[q]q:FTMI-b;**

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

2. Enter **RST-EQPT::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).

---

---

**When to Use**

Use this procedure 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 troubleclearing.

---

**Related Information**

For additional information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to remove and degrow IFTU or FTU plug-ins from service and degrow the unit.

1. To list all plug-ins enter:

**RTRV-STATE-EQPT : : [UNIT - [q]q] : : EQPD;**

To list common plug-ins (no NPCs) enter:

**RTRV-STATE-COM : : : EQPD;**

After response enter **RTRV-STATE-EQPT : : [UNIT - [q]q] : : OOS;**

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 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-EQPT : : UNIT - [q]q : : FC-sb;** (See Note 1.)

**RMV-EQPT : : UNIT - [q]q : : FTMI-d;**

**RMV-EQPT : : 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.

5. If the UNIT is to be degrown, enter the following commands. The DISC FTMI command will have to be entered for each FTMI (1-4) that is grown.

**DISC-EQPT : :UNIT - [q]q : :FTMI -d ;**

**RMV-EQPT : :UNIT - [q]q : :UC ;**

**DISC-EQPT : :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.



---

**When to Use**

Use this set of procedures to provision common equipment.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                  | Reference                                      |
|------|-----------------------------------------|------------------------------------------------|
| 1    | Install common equipment.               | SE 3.15.1 page 3.15-3                          |
| 2    | Grow DS3U or HDS3U common equipment.    | SE 3.15.2 page 3.15-4                          |
| 3    | Restore ECCN/CCN.                       | SE 3.15.3 page 3.15-5<br>SE 3.15.4 page 3.15-6 |
| 4    | Restore UC.                             | SE 3.15.5 page 3.15-7                          |
| 5    | Restore DS3U or HDS3U common equipment. | SE 3.15.6 page 3.15-8                          |

---



## SE 3.15.1: Install Common Equipment and Protection MMFG

### Procedure

1. If not already installed, install the 563A power units in designated slots. Verify that all the green power LEDs are lighted and that no red failure LED is lighted.

**NOTE:**

Two of the three power units will supply the load, but the third one is required for backup reserve power.

2. Verify that all the 77H LED fuses are installed in the fuse board. See Table 3.15-1 for the fuse assignments.
3. Disconnect any one of the power units and verify that the red failure indicator on the other two power units does not light.
4. Return the power unit to operation.
5. Repeat the above test (disconnecting a different 563A unit, observing the LEDs on others, and repowering) to test all combinations in the power group.

**Table 3.15-1. DS3U Fuse Assignment**

| Fuse Designation | Associated CPs |
|------------------|----------------|
| L                | P MXR (HMXR)   |
| K                | 1 MXR (HMXR)   |
| J                | 2 MXR (HMXR)   |
| I                | 3 MXR (HMXR)   |
| H                | 0 FMT (HFMT)   |
| G                | UC             |
| F                | 1 FMT (HFMT)   |
| E                | S FLI          |
| D                | P FLI          |
| C                | 4 MXR (HMXR)   |
| B                | 5 MXR (HMXR)   |
| A                | 6 MXR (HMXR)   |

## SE 3.15.2: Grow DS3U or HDS3U Common Equipment and Protection MMFG

---

### Procedure

This command is used to grow the unit in the data base and to define the type of application (FTU, DSPU, DS3U, HDS3U). 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. The FLI S and P, FMT 0 and 1, and protection MXR are also grown when this command is executed.

**NOTE:**

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

If you need to see the unit assignments that have been entered in the software configuration file, enter **RTRV-PRMTR-NE**; (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the INIT-SYS 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.

1. Familiarize yourself with the command  
**CRTE-CNFGRN-EQPT::UNIT-[q]q:::[mnxyz];**

Where:

- [q]q = Unit number (1 through 16).
- mn = Unit type; DT for DS3U. HT for HDS3U. Default is FT.
- xyz = Variables that define type parameters; xyz = 100 unless different value is given in circuit order information.

**NOTE:**

When growing an HDS3U, the protection MXR slot must be equipped with an HMXR circuit pack (type HX100).

2. Enter the command with the required information.
  3. Repeat procedure for any other units to be grown.
-

---

### SE 3.15.3: Restore ECCN

---

**Procedure**

Use this procedure to restore the ECCN.

1. If the CCI pack was just installed in a previous procedure, enter

**RST-EQPT: :CCI-s;**

Where

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-EQPT: :ETSI-s;**

Restore ETSIs individually:

**RST-EQPT: :ETSI-sqq;**

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

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

---

## SE 3.15.4: Restore CCN

### Procedure

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-EQPT::CCNI-s;**

Where:

s = Network side (0 or 1).

2. If a CCB was just installed in a previous procedure, enter **RST-EQPT::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:

To restore all TSIs in a unit:

**RST-CNFRN-EQPT::UNIT-q::CCN-s\  
[:a[,b[,c[,d[,e[,f]]]]]]];**

To restore all the TSIs on a side (see Note):

**RST-EQPT::CCN-s,TSIS;**

To restore TSIs individually:

**RST-EQPT::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).

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.

---

## SE 3.15.5: Restore UC

---

1. Enter **RST-EQPT::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.

---

## SE 3.15.6: Restore DS3U or HDS3U Common Equipment

---

### Procedure

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-EQPT::UNIT-[q]q::FMT-0;  
RST-EQPT::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-EQPT::UNIT-[q]q::FLI-P;  
RST-EQPT::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.

---

---

**When to Use**

Use this set of procedures to provision the MMFG.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                                   | Reference             |
|------|----------------------------------------------------------|-----------------------|
| 1    | Install common equipment and protection MMFG.            | SE 3.16.1 page 3.16-3 |
| 2    | Grow DS3U or HDS3U common equipment and protection MMFG. | SE 3.16.2 page 3.16-4 |
| 3    | Grow MMFG.                                               | SE 3.16.3 page 3.16-5 |
| 4    | Grow MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6).    | SE 3.16.4 page 3.16-7 |
| 5    | Restore MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6). | SE 3.16.5 page 3.16-8 |
| 6    | Restore Protection MMFG and Service MMFG.                | SE 3.16.6 page 3.16-9 |

---



## SE 3.16.1: Install Common Equipment and Protection MMFG

### Procedure

1. If not already installed, install the 563A power units in designated slots. Verify that all the green power LEDs are lighted and that no red failure LED is lighted.

**NOTE:**

Two of the three power units will supply the load, but the third one is required for backup reserve power.

2. Verify that all the 77H LED fuses are installed in the fuse board. See Table 3.16-1 for the fuse assignments.
3. Disconnect any one of the power units and verify that the red failure indicator on the other two power units does not light.
4. Return the power unit to operation.
5. Repeat the above test (disconnecting a different 563A unit, observing the LEDs on others, and repowering) to test all combinations in the power group.

**Table 3.16-1. DS3U Fuse Assignment**

| Fuse Designation | Associated CPs |
|------------------|----------------|
| L                | P MXR (HMXR)   |
| K                | 1 MXR (HMXR)   |
| J                | 2 MXR (HMXR)   |
| I                | 3 MXR (HMXR)   |
| H                | 0 FMT (HFMT)   |
| G                | UC             |
| F                | 1 FMT (HFMT)   |
| E                | S FLI          |
| D                | P FLI          |
| C                | 4 MXR (HMXR)   |
| B                | 5 MXR (HMXR)   |
| A                | 6 MXR (HMXR)   |

## SE 3.16.2: Grow DS3U or HDS3U Common Equipment and Protection MMFG

### Procedure

This command is used to grow the unit in the data base and to define the type of application (FTU, DSPU, DS3U, HDS3U). 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. The FLI S and P, FMT 0 and 1, and protection MXR are also grown when this command is executed.

**NOTE:**

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

If you need to see the unit assignments that have been entered in the software configuration file, enter **RTRV-PRMTR-NE**; (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the INIT-SYS 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.

1. Familiarize yourself with the command  
**CRTE-CNFGRN-EQPT::UNIT-[q]q:::[mnxyz];**

Where:

- [q]q = Unit number (1 through 16).
- mn = Unit type; DT for DS3U. HT for HDS3U. Default is FT.
- xyz = Variables that define type parameters; xyz = 100 unless different value is given in circuit order information.

**NOTE:**

When growing an HDS3U, the protection MXR slot must be equipped with an HMXR circuit pack (type HX100).

2. Enter the command with the required information.
3. Repeat procedure for any other units to be grown.

### **SE 3.16.3: Grow MMFG [MXR (KCR-1), EMXR (KCR-5), or HMXR (KCR8)]**

#### **Procedure**

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: **CRTE-EQPT : :UNIT - [q]q : :MXR-c [&&-d] : [mnxyz] : [BERM-s] [, BERT-t] [, LBO-{ON|OFF}];**

Where:

- [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 3.16-2.
  - MX100** - KCR-1 circuit pack with M13 framing.
  - MX200** - KCR-1 circuit pack with C-bit parity framing.
  - EX100** - KCR-5 circuit pack with M13 framing.
  - EX200** - KCR-5 circuit pack with C-bit parity framing.
  - HX100** - KCR-8 Hybrid circuit pack with M13 framing (X-bits=0 is normal, 1 is RAI).
  - HX110** - KCR-8 Hybrid circuit pack with M13 framing and reverse interpretation of X-bit values (X-bits=1 is normal, 0 is RAI).
- 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 10u-3d (default) or t=6 for 10u-6d.
- ON|OFF = Turns the line buildout on or off, defaults to OFF.

2. Check output message to verify type and option entries.
3. To familiarize yourself with query outputs, enter **RTRV-STATE-EQPT : : [UNIT - [q]q] : :EQPD;** and **RTRV-STATE-EQPT : :UNIT - [q]q : :PROTN;** 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 PROTN output, the MXRs are shown as UEQD, IS (in-service), or OOS.

**Table 3.16-2. 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) |

---

### SE 3.16.4: Grow MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)

---

#### Procedure

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:

**CRTE-EQPT : :UNIT- [q]q : MIU-c [&&-d] : [mnxyz] ;**

Where:

- [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.
-

### **SE 3.16.5: Restore MIU/EMIU Multiplexer Interface Unit (KCR2/KCR6)**

---

#### **Procedure**

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-EQPT: :UNIT- [q]q: :MIU-c [&&-d] : [INCL] ;**

Where:

[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.



#### **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.

---

## SE 3.16.6: Restore Protection MMFG and Service MMFG

---

### Procedure

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-EQPT: :UNIT- [q]q: :MMFG-p[: INCL];**

Where:

- [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.

---





---

## Activate/Deactivate DS3 Unprotected Service Alarm

# 3.17

---

### When to Use

Use this procedure to either activate or deactivate a minor alarm that will be generated when DS3 service is left manually unprotected. This alarm is applicable only to the FLI, MMFG, and UC circuit packs. This alarm is activated by default.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

---

## Instructions

---

Use this procedure to either activate or deactivate a minor alarm that will be generated when DS3 service is left manually unprotected.

1. To activate this alarm, enter the following command:

**ED-PRMTR-T3 : UNPROTALM-ON**

2. To deactivate this alarm, enter the following command:

**ED-PRMTR-T3 : UNPROTALM-OFF**

---

---

## Remove and Degrow DS3U or HDS3U

# 3.18

---

### When to Use

Use this procedure to remove DS3U or HDS3U 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. 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.

---

### Before You Begin



#### **CAUTION:**

*Performing this procedure incorrectly can interrupt service.  
Familiarize yourself with the procedure and commands before beginning  
and perform each step of the procedure in the order given.*

---

### Related Information

For additional information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to remove DS3U or HDS3U plug-ins from service and to degrow the unit.

1. To list all plug-ins enter:

**RTRV-STATE-EQPT : : [UNIT - [q]q] : : EQPD ;**

To list common plug-ins (no NPCs) enter:

enter **RTRV-STATE-COM : : : EQPD ;**.

After response enter **RTRV-STATE-EQPT : : [UNIT - [q]q] : : OOS ;**.

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 DS3U unit 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:
  - When unit packs are removed from service and the unit UC is degrown, the associated DS3U FMTs (or HDS3U HFMTs) and ETSI or CCB 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).
  - For DS3 unit, the FRC keyword for the RMV MMFG (MIU-MXR function group) command forces the removal without protection switching (or switchback if MMFG P). The removal would normally be denied if switching did not occur. The FRC must be used to remove more than one MMFG at a time.
  - For DS3 unit, an unprotected FLI can only be removed when all the following are true: no service MXR is grown, the protection MXR (multiplexer) is not grown, and protection MIU (multiple interface unit) is out-of-service.
4. Enter the following commands to remove the DS3U or HDS3U unit.



**NOTE:**

If you are going to degrow equipment and there are no service cross-connections on the DS3, the FRC and INCL keywords can be

used to remove all NPCs on the MMFG. You can also remove a range of MMFGs to expedite unit degrowth.

If you need to remove the FMT (HFMT) only (that is, not degrowing the DS3U (HDS3U) in which case, the FMT (HFMT) will automatically be removed), enter **RMV-EQPT::UNIT-[q]q::FMT-s;**

**RMV-EQPT::UNIT-[q]q::MMFG-c[&&-d][:FRC[, INCL];**

**RMV-EQPT::UNIT-[q]q::MMFG-P;**

**RMV-EQPT::UNIT-[q]q,MIU-P;** (if equipped)

Where:

[q]q = Unit number (1-16).

c = (1-6).

s = Side 0 or 1.

FRC = forces remove without switching to remove multiple MMFGs or with INCL keyword.

INCL = removes all NPCs on MXR.

If you need to specifically remove only the FLI or unit UC, enter **RMV-EQPT::UNIT-[q]q::FLI-k;** where: k = S, P (See Note.)

**RMV-EQPT::UNIT-[q]q::UC;** (See Note.)

If the unit is to be degrown, the remove FLI and remove unit UC commands should be entered with the degrowth commands. The unit UC must be in-service to use commands in degrowth portion.

5. If the UNIT is to be degrown, enter the following commands.

**DISC-EQPT::NPC-<npc No.>[&&[&]-<range>];**

**DISC-EQPT::UNIT-[q]q::MIU-c[&&-d];** (if equipped)

**DISC-EQPT::UNIT-[q]q::MXR-c[&&-d];**



**NOTE:**

MXR P (protection) will automatically be degrown when the DS3U is degrown.

**DISC-EQPT::UNIT-[q]q::MIU-P;**

**RMV-EQPT::UNIT-[q]q::FLI-k;** where: k = S, P

**RMV-EQPT::UNIT-[q]q::UC;**

**DISC-EQPT::UNIT-[q]q;**

**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. The FLI S and FLI P and MXR P will also be automatically degrown.

---

---

**When to Use**

Use this set of procedures to provision the DSPU.

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

## Instructions

---

### Task

| Step | Action                                            | Reference                                            |
|------|---------------------------------------------------|------------------------------------------------------|
| 1    | Install DSPI and CPU circuit packs and grow DSPU. | SE 3.19.1 page 3.19-3                                |
| 2    | Restore ECCN/CCN.                                 | SE 3.19.2 page 3.19-5<br>or<br>SE 3.19.3 page 3.19-6 |
| 3    | Restore UC and DSPI.                              | SE 3.19.4 page 3.19-7                                |

---



---

## SE 3.19.1: 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.

If you need to see the unit assignments that have been entered in the software configuration file, enter **RTRV-PRMTR-NE**; (see Note). This configuration was set during the equipment installation and acceptance, but it can still be changed with the INIT-SYS 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.

---

### Before You Begin

Install DSPI Card (UM29 Code) and CPU2 Card (TM778) in designated slots.

---

**Procedure**

1. Familiarize yourself with the command:

```
CRTE - CNFGRN - EQPT : : UNIT - [q]q : \  
[ : (a[, b[, c[, d[, e[, f]]]])] : DP100 ;
```

Where:

[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.).

2. Enter the command with the required information.
  3. Repeat the procedure for any other units to be grown.
-

## SE 3.19.2: Restore ECCN

---

### Procedure

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-EQPT::CCI-s;**

Where:

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-EQPT::ETSI, ECCN-s;**

Restore individually:

**RST-EQPT::ETSI-sqq;**

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

Proceed to *Restore UC and DSPI* to restore the UC and DSPI.

---

### SE 3.19.3: Restore CCN

#### Procedure

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-EQPT::CCNI-s;**  
Where s = Network side (0 or 1).
2. If a CCB was just installed (for a DSPU) in a previous procedure, enter **RST-EQPT::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-CNFRN-EQPT::UNIT-q::CCN-s\  
[:a[,b[,c[,d[,e[,f]]]]]]];**

Restore all the TSIs on a side (see Note):

**RST-EQPT::CCN-s,TSIS;**

Restore TSIs individually:

**RST-EQPT::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).

---

## SE 3.19.4: Restore UC and DSPI

---

### Procedure

1. Enter **RST-EQPT::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-EQPT::UNIT-[q]q::DSPI**; to restore DSPI.
-



---

**When to Use**

Use this procedure 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.

---

**Related Information**

For additional information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to remove DSPU plug-ins from service and to degrow the unit.

1. To list all plug-ins enter:

**RTRV-STATE-EQPT : : [UNIT- [q]q] : : EQPD;**

To list common plug-ins (no NPCs) enter:

**RTRV-STATE-COM : : : EQPD;**

After response enter **RTRV-STATE-EQPT : : [UNIT- [q]q] : : OOS;**

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 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 disconnect NPC command removes both NPC sides from service and degrows the NPC; the RMV-EQPT command is not used.
4. Enter the following commands to remove the DSPU.

**RMV-EQPT : : UNIT- [q]q : : DSPI;**

**RMV-EQPT : : UNIT- [q]q : : UC;**

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

5. If the UNIT is to be degrown, enter the following command.

**DISC-EQPT : : UNIT- [q]q;**



**NOTE:**

The ETSIs, or CCBs and TSIs on both sides of the unit will be degrown when the unit is degrown.



---

**When to Use**

Use this set of procedures to change the following:

- DS1 equalizer value
- DS1 equalizer value on 19.2-kb/s MJU circuit pack
- DS3 MXR/HDS3 HMXR parameters
- Alarm Activate Integration Time Setting

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

**Task**

Choose which procedures to perform from the following table.

| Action                                                    | Reference             |
|-----------------------------------------------------------|-----------------------|
| Change DS1 equalizer value.                               | SE 3.21.1 page 3.21-3 |
| Change DS1 equalizer value on 19.2-kb/s MJU circuit pack. | SE 3.21.2 page 3.21-5 |
| Change DS3 MXR/HDS3 HMXR parameters.                      | SE 3.21.3 page 3.21-6 |
| Change alarm activate integration time.                   | SE 3.21.4 page 3.21-7 |
| Retrieve alarm activate integration time.                 | SE 3.21.5 page 3.21-8 |

---

### **SE 3.21.1: Change DS1 Equalizer Value**

#### **Procedure**

This procedure uses the command to change the value of the equalizers for the facility terminating module. The equalization for each half of the shelf, which contains 10 dual digroup cards, can be set to different values. This command is used to enter new values of equalization (or make corrections) and is used to enter the value for the second half of the shelf if it was not entered initially. The FTMI must be in-service to change an equalizer value.

1. Familiarize yourself with the five values of equalization for the length of cabling to the line interface jacks (for example, DSX-1 bay) per Table 3.21-1.
2. Enter the command with the value of equalization for each half of the shelf as follows (see Note):

**ED-PRMTR-EQPT: :UNIT-[q]q: :FTMI-d:EQL-l,r;**

Where:



**NOTE:**

For DS1 equalizers, you can use a dash (--) in place of the value for one side to indicate that the existing value remains the same.

3. Check NEW STATE EQL values in output message to verify that correct information was entered; if there is an error, repeat this procedure to make corrections.

**Table 3.21-1. DS1 Equalizer Values**

| Setting | Cable Length (22 Gauge) | Cable Length (26 Gauge) |
|---------|-------------------------|-------------------------|
| 1       | 0 through 133 feet      | 0 through 90 feet       |
| 2       | 133 through 267 feet    | 90 through 180 feet     |
| 3       | 267 through 400 feet    | 180 through 270 feet    |
| 4       | 400 through 533 feet    | 270 through 360 feet    |
| 5       | 533 through 655 feet    | 360 through 450 feet    |

## SE 3.21.2: Change DS1 Equalizer Value on 19.2-kb/s MJU Circuit Pack

### Procedure

Use this procedure to change the DS1 equalizer value on a 19.2-kb/s MJU circuit pack.

1. With the MJU circuit pack out of the shelf, locate the two miniature switches (DIP switches) on the component side of the MJU circuit board. These switches are located near the bottom edge; switch SW2 is not used.
2. Set the rockers on the DIP switch SW1 to select the required equalizer values based on the distance to the DSX-1 bay per Table 3.21-2.



#### NOTE:

To set a switch to the on position, push the rocker to the 1 position.



#### NOTE:

The selected equalization will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and will be read again whenever the **RESET** button on the circuit pack is operated.

3. Repeat the procedure to set the equalizers on the other MJUs in the shelf.

**Table 3.21-2. 19.2-kb/s Equalization Settings**

| Cable Length (Feet) |                    | Switch Setting |          |          |
|---------------------|--------------------|----------------|----------|----------|
| Type 609 (22 GA.)   | Type 1249 (26 GA.) | Rocker 1       | Rocker 2 | Rocker 3 |
| 0 through 50        | 0 through 90       | on             | on       | on       |
| 51 through 267      | 91 through 180     | on             | on       | off      |
| 268 through 400     | 181 through 270    | on             | off      | on       |
| 401 through 533     | 271 through 360    | on             | off      | off      |
| 534 through 655     | 361 through 450    | off            | on       | on       |

### SE 3.21.3: Change DS3 MXR/HDS3 HMXR Parameters

#### Procedure

The command in this procedure is used to change the type specification and any operating options of an MXR or HMXR pack that has been already grown in the data base. These options are:

- **BERM** - Bit Error Rate Calculation
- **BERT** - Bit Error Rate Threshold
- **LBO** - Line Build-Out Setting
- **TYPE** - The DS3 or HDS3 facility type and framing format

The MXR or HMXR and facility must be removed from service to change the type specification; this is accomplished by removing the MMFG for the MXR or HMXR.

1. If the type specification is to be changed, enter the command to remove the MMFG for the MXR/HMXR as follows:

**RMV-EQPT : :UNIT - [q]q : :MMFG - c [&&-d] [ :FRC [ , INCL ] ] ;**

Where:

- [q]q = Unit number (1 through 16).
- c = MMFG number (1 through 6).
- d = Optional, last MMFG number of range of MMFGs.
- FRC = Optional, to force removal without accompanying protection switching (required when protection switching is not available).
- INCL = Optional, to remove all equipped component NPCs from service.

2. Enter command as follows:

**ED-PRMTR-T3 : :UNIT - [q]q : :DS3 - c [&&-d]  
: [BERM - s] [ , BERT - t ] [ , LBO - b ] [ , TYPE - mnxyz ] ; .**

Where:

3. Check output message to verify type and option entries.
4. Enter command to restore MMFG as follows:

**RST-EQPT : :UNIT - [q]q : :MMFG - c [&&-d] [ :INCL ] ;**

Where: INCL = Causes all component NPCs to also be restored.

### SE 3.21.4: Change Alarm Activate Integration Time

---

**Procedure**

The alarm activate integration time is the duration between a DS3 LOS/OOF/AIS/IDLE/BER alarm and the display of its corresponding alarm message. DACS II provides the ability to change this alarm activate integration time within the range between 2 and 10 seconds. Now, the DACS II can be set to generate alarm idle messages for alarms that persist for less than 10 seconds. This applies to all Hybrid/DS3 units and the MXR, EMXR, and HMXR multiplexers.

1. Enter **ED-PRMTR-T3:::DS3ALMDLY:[x]x;**

Where:

DS3ALMDLY = Delay time for DS3 alarm message output.

[x]x = Delay time (2 through 10, in steps of 1; default=10).

---

---

### **SE 3.21.5: Retrieve Alarm Activate Integration Time Setting**

---

Use the following command to query the alarm activate integration time setting and to query the status of alarm messages suppression for DS1s in DS3 units and DS1s and E1s in Hybrid DS3 units:

1. Enter **RTRV-ALM-T3:::DS3ALM;**

Where:

DS3ALM = DS3 alarm activate integration time and message suppression status.

---



---

## Set Optional Alarm Threshold in Data Base

# 3.22

---

### When to Use

Use this procedure 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 CRTE or ED commands. If the alarm thresholds for an NPC are not specified, the internal default values apply. Different alarm types apply to the NPCs for DS1 and 2.048-M/bs Interface.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

---

## Instructions

---

Use this procedure to enter (or change) values which are stored as options for facility NPC alarm thresholds.

1. To see if other options have been established, enter **RTRV-*OPT-T1*: :NPC: :[{mn|ALL}]** ;  
where the options for one type (for example, DE or PB) 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.

**ED-*OPT-T1*: :NPC: :{ALL|TYPE-mn}:rr:set1,set2,set3**;

Where:

TYPE mn|ALL = Selects all NPCs in frame or only those of specified type (for example, TYPE DE).

rr = Identifier for parameter to be changed.

set1,set2,set3 = Any of three values to be stored for the parameter.

3. See the following example which shows two values being added as options for degraded minutes (1 hour) alarm threshold.

EXAMPLE: **ED-*OPT-T1*: :NPC: :TYPE-DE:03:5,4,-** ;

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.
  5. Check completion message to verify changes.
  6. Enter **STA-*LOCL-RST*: :PRI** ; to boot in new values and prevent FRADTS messages.
-

---

## Install Circuit Packs and Grow Type DE NPC (IFTU2 NPC without *SLC* Carrier)

# 3.23

---

### When to Use

Use this command to define 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: DS1 line and channel formats, facility alarm thresholds, and the channel insertion word. The DS1 line formats are given by the TYPE specification; TYPE DE100 is the default. If used, alarm threshold options must already be defined in the data base per *Set Optional Alarm Threshold in Data Base*. The IW (insertion word) for the NPC is sent out on all channels when the NPC is removed from service and, unless overridden by the DCC option in the disconnect command(s), the IW is sent on any non-connected channel.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## SE 3.23.1: Install Circuit Packs and Grow Type DE NPC

### Procedure

Use this command to define the operating characteristics of the NPC in the data base.

1. Install the appropriate circuit pack cards in the NPC slots to be equipped from the following list: TG80 or TG80B DDC, or TG186 ZDC (for special zero code suppression, Z BTSI).

2. Familiarize yourself with the following command:

```
CRTE-EQPT::NPC-<npc No.>[&&&]-<range>]::[DExyz]  
[:rr/l&ss/m,&tt/n,...)][:IW-X-pq][,AIS-{INFO|MJ|MN}];
```

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, last NPC of continuous range of NPCs. Three ampersand (&s) are required for hierarchical.
- xyz = Line and channel format specification; DE100 is the default.
- rr/l...tt/n = Optional, to list any one or all alarm types.
- pq = Optional, to enter IW in hexadecimal form; Default is 7F. See typical values in Step 4. **The IW field is not applicable for clear-DS1 NPC.**
- AIS field = Optional; to specify class of output message issued when AIS is received: INFO (default) for information, MJ for major alarm, or MN for minor alarm.

3. If you are going to use the optional alarm threshold field, consider the following items:
  - The errored second parameters are only applicable with the ESF line format and T1DM format.
  - Only alarm types 01 through 04 are applicable to IFTU2 clear-DS1s.
  - When TG80B is used as clear-DS1, BER is calculated from BPV and the high-end BER threshold is 10u-4d instead of 10u-3d.
  - If you are going to use the IW field, consider the following:
  - The two hexadecimal digits define an 8-bit insertion word for unassigned channels. To prevent the generation of a yellow alarm condition (with D4 line format), the hexadecimal number for the left digit must not be one that corresponds to a binary number with bit 2 = 0 (that is, decodes to x0xx).

- Insertion word 7F is defined as the UAC (unassigned channel code) and is typically used for type DE/TE 1yz and type DS NPCs.
  - Insertion word 18 is defined as the UMC (unassigned multiplexer code) and is required for a type DE4yz NPC (T1DM format for Digital Data System).
  - MUX keyword - IW = IA.
  - Insertion word FF is all ones and is used for 2.048-Mb/s Interface NPC applications.
4. Enter command with required information. **For clear-DS1, the only y-option that are applicable are 1 or 2.**
  5. EXAMPLE: **CRTE-EQPT : :NPC-012 : :DE400:01/1&03/2&07/2 :  
IW-X-18 ;**  
Check completion message to verify changes.
-



---

**Install Circuit Packs and Grow Type  
DA NPC (IFTU2 NPC without *SLC*  
Carrier)**

# 3.24

---

**When to Use**

Use this procedure to install and grow type DA NPCs.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

---

## Instructions

---

Use this procedure to install and grow type DA NPCs.

1. Install the TG191 circuit pack in the NPC slot.
2. Familiarize yourself with the command as follows:

```
CRTE-EQPT::NPC <npc No.>::mnxyz:\  
[rr/m][&rr/m][...]:[IW-X-pq[,INCL]]\  
[,AIS-{INFO|MJ|MN}][,PL-{ENA|DSA}];
```

Where:

|           |   |                                                     |
|-----------|---|-----------------------------------------------------|
| <npc No.> | = | NPC number.                                         |
| <range>   | = | Optional, last NPC of continuous range of NPCs.     |
| mn        | = | NPC type DA.                                        |
| xyz       | = | NPC type identifier.                                |
| rr        | = | Facility performance parameter number.              |
| m         | = | Facility performance threshold index (0 through 3). |
| IW        | = | Insertion word.                                     |
| INCL      | = | Inclusive.                                          |
| AIS       | = | Alarm Indication Signal.                            |
| INFO      | = | Information message (not an alarm).                 |
| MJ        | = | Major.                                              |
| MN        | = | Minor.                                              |
| 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.

When the PL field is not specified, the default is payload loopback enabled.

---



---

|                    |                                                                                 |
|--------------------|---------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this set of procedures to provision a DSP platform NPC and restore the NPC. |
|--------------------|---------------------------------------------------------------------------------|

---

|                            |                                                                              |
|----------------------------|------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> . |
|----------------------------|------------------------------------------------------------------------------|

---

## Instructions

---

### Task

| Step | Action                                                      | Reference                |
|------|-------------------------------------------------------------|--------------------------|
| 1    | Install circuit pack and grow DSP platform application NPC. | SE 3.25.1    page 3.25-3 |
| 2    | Restore NPC.                                                | SE 3.25.2    page 3.25-4 |

---

### **SE 3.25.1: Install Circuit Pack and Grow DSP Platform Application NPC**

#### **Procedure**

This procedure provisions a DSP Platform application Network Processing Circuit (NPC). A single NPC or range of NPCs may be provisioned using the command that is described in this procedure.

1. Ground yourself to the shelf by using a wrist strap.
2. Install a TG193B circuit pack in the desired slot.
3. Enter the following command line to provision a DSP Platform application NPC:

**CRTE-EQPT::NPC-<npc No. 1>[&&-<npc No. 2>]::SDxyz;**

Where:

- NPC = Network processing circuit.
- <npc No. 1> = The NPC number that is either a single NPC or the first NPC of a range specification; in either extended (for example, [0]001) or hierarchical (for example, 01101). This NPC number must be odd.
- <npc No. 2> = The optional NPC number that is the last NPC of a range specification; in either extended (for example, [0]001) or hierarchical (for example, 01101). This NPC number must be odd.
- xyz = The argument xyz is a 3-digit hexadecimal number. The 3 digits in xyz indicate the particular type of application to be provisioned.

Before growing a DSP Platform application NPC the user must install the application software on the DACS II ISX system. The software installation procedure is documented in the individual application manual.

## SE 3.25.2: Restore NPC

---

### Procedure

Until NPCs are restored to service, facility alarms are not registered and DACS II sends trunk conditioning out over the facility. In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. The looped tests that are included in the diagnostics test the transmission paths in the NPC (except line transformers) and test some of the facility checking circuitry. A hardware failure will cause a failed diagnostic and a restore denial. A facility problem will cause a CGA or PBA alarm.

**NOTE:**

Early TG80s (before Series 5) cannot be grown as clear-DS1.

1. Enter **RST-EQPT::NPC-<npc No.>[&&[&]-<range>];;**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, to name the final NPC when it is desired to restore a continuous range of IFTU2-NPCs. Three ampersand (&s) are required for hierarchical.

2. Repeat the procedure as needed to restore other NPCs (or groups of NPCs).

If an NPC is restored but its FTMI is OOS the **RTRV-STATE-EQPT;** command will not show the alarm counts and alarms will not be displayed.

---

---

**Grow Type DS NPC (IFTU2 NPC  
with *SLC* Carrier)**

# 3.26

---

|                    |                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to enter information (grow) into the database to provision the NPC as a type DS. |
|--------------------|-----------------------------------------------------------------------------------------------------|

---

|                            |                                                                              |
|----------------------------|------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> . |
|----------------------------|------------------------------------------------------------------------------|

---

## Instructions

### Procedure

DS1 line formats, alarm threshold options, and the channel insertion word are entered in this command. The NPC records facility slips, bit error rate, errored seconds, severe errored seconds, change of frame alignment and, for *SLC* 96 carrier, records shelf alarms from the RT equipment. Either default values or stored optional values for the alarm thresholds and shelf alarms are selected with this command. These options (not the default values) must first be entered in the data base by the ED OPT T1 command. The IW (insertion word) that is defined here for the NPC is sent out on the channels when the NPC is out of service or the channels are not yet cross-connected.

1. Familiarize yourself with the command as follows and the variables per Table 3.26-1:

```
CRTE-EQPT::NPC-<npc No.>[&&[&]-<range>]\  
::DSxyz:[rr/s&rr/s...tt/s]:[IW-X-pq];
```

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Last NPC in a range. Extra ampersand (&) needed for hierarchical.
- xyz = DS1 line format and channel counting options per Table 3.26-1. See example in Step 2.
- rr/l, tt/n = Optional to select any one or all alarm types (01 through 10) per Table 3.26-2 and previously defined options (1, 2, or 3). Shelf alarms are not selectable for *SLC* Series 5 carrier.
- IW-X-pq = Optional to specify HEX code for IW pattern either pq = FF for all 1s pattern, or pq = 7F for unassigned channel code (default value).

2. See the following example and notes. If optional alarm thresholds or IW are not given (nor required), the corresponding fields can be omitted from the command.

EXAMPLE:

```
CRTE-EQPT::NPC-012::DS600:01/1&03/2:IW-X-FF;
```

3. Enter command with required information.
4. Check output message to verify type and option selections.

**Table 3.26-1. Type DS Options**

| <b>Option</b> | <b>Meaning</b>                                    |
|---------------|---------------------------------------------------|
| <b>X</b>      | <b>Multiframe Format</b>                          |
| 0             | Unassigned                                        |
| 1             | D4 bank                                           |
| 2             | ESF (extended superframe) - voice                 |
| 3             | Unassigned                                        |
| 4             | Unassigned                                        |
| 5             | Unassigned                                        |
| 6             | <i>SLC</i> 96 carrier Fs format                   |
| 7             | <i>SLC</i> Series 5 ESF with data link            |
| 8,9           | Unassigned                                        |
| <b>Y</b>      | <b>Zero Code Suppression</b>                      |
| 0             | ZCS (zero code suppression)                       |
| 1             | NZCS (no zero code suppression)                   |
| 2             | B8ZS (bipolar with 8 zero substitution)           |
| 3-9           | Unassigned                                        |
| <b>Z</b>      | <b>Channel Counting Sequence</b>                  |
| 0             | <i>SLC</i> 96 carrier Mode III, D4 bank sequence  |
| 1             | <i>SLC</i> 96 carrier Mode III, D1D bank sequence |
| 2             | <i>SLC</i> 96 carrier Mode I, D1D bank sequence   |
| 3             | <i>SLC</i> Series 5 carrier, D4 bank sequence     |
| 4-9           | Unassigned                                        |

**Table 3.26-2. Facility Thresholds**

| <b>Option<br/>(rr)</b> | <b>Parameter</b>                                         | <b>Range</b>     | <b>Default</b> |
|------------------------|----------------------------------------------------------|------------------|----------------|
| 01                     | SLIP major                                               | 000* to 255      | 255            |
| 02                     | SLIP minor                                               | 000* to 255      | 4              |
| 03                     | Bit error rate major                                     | 10u-6d to 10u-4d | 10u-4d         |
| 04                     | Bit error rate minor                                     | 10u-6d to 10u-4d | 10u-4d         |
| 05                     | Errored seconds                                          | 00001 to 65535   | 864            |
| 06                     | Severe errored seconds                                   | 001 to 255       | 225            |
| 07                     | Change of frame alignment,<br>major                      | 001 to 511       | 511            |
| 08                     | Change of frame alignment,<br>minor                      | 001 to 255       | 17             |
| 09                     | Shelf alarm, near end                                    | 00000 to 65535   | 00000          |
| 10                     | Shelf alarm, far end                                     | 00000 to 65535   | 00000          |
| *                      | Setting the SLIP threshold to zero suppresses the alarm. |                  |                |



---

**When to Use**

Use this procedure to grow type DS3U or HDS3U NPCs.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                      | Reference             |
|------|---------------------------------------------|-----------------------|
| 1    | Install circuit packs and grow type TA NPC. | SE 3.27.1 page 3.27-3 |
| 2    | Grow type TE NPCs.                          | SE 3.27.2 page 3.27-4 |
| 3    | Restore NPCs.                               | SE 3.27.3 page 3.27-6 |

---

## SE 3.27.1: Install Circuit Packs and Grow Type TA NPC

### Procedure

Use the following procedure to install circuit packs and grow type TA NPCs.

1. Install the KCR5 and KCR6 circuit pack in the EMXR/EMIU slot. Note that TA type NPCs are not allowed with a Hybrid DS3U, even if equipped with KCR5 circuit packs.



#### NOTE:

When installing a EMXR/EMIU in the service slot, one must also be installed in the protection slot.

2. Familiarize yourself with the command as follows:

```
CRTE-EQPT::NPC <npc No.>::mnxyz:\
[rr/m][&rr/m][...]:[IW-X-pq[,INCL]]\
[,AIS-{INFO|MJ|MN}][,PL-{ENA|DSA}]
```

Where:

<npc No.> = NPC number.  
 <range> = Optional, last NPC of continuous range of NPCs.  
 mn = NPC type TA.  
 xyz = NPC type identifier.  
 rr = Facility performance parameter number.  
 m = Facility performance threshold index (0 through 3).  
 IW = Insertion word.  
 INCL = Inclusive.  
 AIS = Alarm Indication Signal.  
 INFO = Information message (not an alarm).  
 MJ = Major.  
 MN = Minor.  
 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.

When the PL field is not specified, the default is payload loopback enabled.

## SE 3.27.2: Grow Type TE NPCs

### Procedure

This procedure is used to enter the type specifications of the NPCs on the MXR or HMXR pack. The procedure is optional if the NPCs were restored with the MXR or HMXR. These NPCs are incorporated in the MXR or HMXR pack and are not separate circuit packs. The type specification determines the basic operation (TE) and the line and channel formats of the DS1 signal. Optional fields in the growth command allow selecting different facility performance alarm thresholds and specifying a particular insertion word. The IW for the NPC is sent out on all 24 channels when the NPC is out-of-service, and unless set otherwise by a disconnect command, is sent out on any not-connected channel. The IW is not applicable to clear-channel DS1 for which an AIS is sent in the disconnected or idle state.

1. Familiarize yourself with the command as follows:

```
CRTE-EQPT: :NPC-<npc No.>[&&[&]-<range>]: :  
[mnxyz]:[rr/l&ss/m ...&tt/n)][ :IW-X-pq[,INCL]];
```

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). The additional
- <range> = Optional, for last NPC of continuous range to be grown. Extra ampersand [&] required for hierarchical.
- mn = Type designation, mn = **TE** for DS1 without interface unit operation.
- xyz = Format specification.
- rr,ss,tt = Optional field for type TE NPC to select nondefault alarm thresholds.
- l,m,n = Option number (1 through 3) which has been predefined in the data base; 0 selects default value.
- pq = Optional, hexadecimal notation to specify IW pattern. Typical values are 7F (default), 18 for T1DM format, or FF for all 1s.
- INCL = Optional, used when provisioning an NPC with D4 framing and an insertion word with bit 2 equal to zero.

2. Consider the following restrictions:

- Only y = 1 (NZCS) is applicable for Type TE clear-channel NPC.
- For clear-DS1, only SLIP major and minor thresholds (rr = 01 and 02) can be specified in the OPTS field. The IW field is not used at all.

3. Enter command with required information. If default alarm thresholds and IW are appropriate for the NPCs, the corresponding optional fields can be omitted from the command. See Note.

**EXAMPLE :****CRTE-EQPT : :NPC-16A:TE110:01/1&03/2&07/2:IW-X-FF;****NOTE:**

For clear-DS1, the IW field is not applicable and only SLIP major and minor alarm thresholds can be specified.

4. Check output message to verify type and option entries.
-

---

## SE 3.27.3: Restore NPCs

---

### Procedure

In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. A hardware failure will cause a failed diagnostic and a restore denial.

1. Enter:

**RST-EQPT::NPC-<npc No.>[&&[&]-<range>];;**

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). hierarchical (for example, 01101).

<range> = Optional, to name the final NPC when it is desired to restore a continuous range of IFTU2-NPCs. Extra ampersand (&) required for hierarchical.

2. Repeat the procedure as needed to restore other NPCs (or groups of NPCs).
-

---

## Install, Grow Circuit Packs and Restore DSPU NPC

# 3.28

---

### When to Use

Use this procedure to install, grow circuit packs and restore DSPU NPCs.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                         | Reference             |
|------|--------------------------------|-----------------------|
| 1    | Install DSP NPC circuit packs. | SE 3.28.1 page 3.28-3 |
| 2    | Grow DSP NPC.                  | SE 3.28.2 page 3.28-4 |
| 3    | Restore DSPU NPCs.             | SE 3.28.3 page 3.28-5 |

---



### **SE 3.28.1: Install DSP NPC Circuit Packs (DMB or Subrate -- SRM, MJU)**

---

1. Working on either DSPU side, enter **RMV-EQPT : : {CCNI|CCI}-s ;**

Where:

CCNI = CCN for non-CEF.  
CCI = ECCN for CEF.  
s = DSPU side (0 or 1).



**NOTE:**

The ECCN side is removed here to prevent an alarm (and DSP removal) on other in-service DSPs on the same port.

2. Install required processing CPs (for example, TM655 DMBs) in assigned NPC/DSP slots.
  3. Enter **RST-EQPT : : {CCNI|CCI}-s ;** for the same side, and then enter **RMV-EQPT : : {CCNI|CCI}-s ;** for the other side of the DSPU.
  4. Install required processing CPs (for example, TM655 DMBs) in assigned NPC/DSP slots. The NPCs are duplicated in both the 0DSPU and 1DSPU sides; cards must be installed in the same NPC slots on both sides.
  5. Enter **RST-EQPT : : {CCNI|CCI}-s ;** to restore the corresponding network side to service.
-

---

## SE 3.28.2: Grow DSP NPC

---

### Procedure

Use this procedure to grow the DSP NPC.

1. Check circuit order information and office records to determine the next NPC to be grown for use for DMBs (digital multipoint bridges) or subrate data processing.

**NOTE:**

For DMB circuits, the pair of NPCs for each DMB is grown simultaneously by naming the lower NPC number in the command.

2. Enter **CRTE-EQPT::NPC-<npc No.>::mnxyz;**  
to grow the next NPC.

**NOTE:**

The command completion message will name both NPCs of the pair that has been grown.

Where:

- <npc No.> = Next addressable NPC in DSPU (lower NPC of each pair), either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- mnxyz = Type specification. MB100 for digital multipoint bridge, SR100 for subrate data multiplexer, or MJ100 for subrate data multipoint junction unit.
-

---

### SE 3.28.3: Restore DSPU NPC

---

**Procedure**

Use this procedure to restore the DSPU NPC.

**NOTE:**

In the process of restoring, the DACS II runs both an out-of-service and in-service diagnostic and provisions the NPCs according to the NPC growth information. A hardware failure will cause a failed diagnostic and a restore denial.

1. Enter **RST-EQPT::NPC-<npc No.>::SIDE-s;**

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01) .  
s = DSPU side (0 or 1).

**NOTE:**

With DMB circuit packs, both the NPCs on the circuit pack will be restored when the lower numbered NPC of the pair is entered in the command.

2. Repeat the procedure as needed to restore NPC on the other side and any other NPCs, as required.
-



---

**When to Use**                      Use this procedure to change the Hub ID.

---

**Related Information**              For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                       | Reference             |
|------|----------------------------------------------|-----------------------|
| 1    | Change Subrate Hub ID.                       | SE 3.29.1 page 3.29-3 |
| 2    | Change Hub ID on 19.2-kb/s MJU circuit pack. | SE 3.29.2 page 3.29-4 |

---

---

## SE 3.29.1: Change Subrate Hub ID

---

### Procedure

This procedure sets or changes the HUBID number.

1. Enter **ED-PRMTR-NE:::HUBID-0-ab;**

Where:

ab = HUBID code (two octal digits; each digit can have a value of 0 to 7).

---

### SE 3.29.2: Change Hub ID on 19.2-kb/s MJU Circuit Pack

---

#### Procedure

1. With the MJU circuit pack out of the shelf, locate the 6-position miniature switch (DIP switch) on the backside of the MJU circuit board. This switch is the only one on the backside of the board, and it is located near the right-side edge.
2. Familiarize yourself with making settings on the switch. The six rocker positions designated 1 through 6 allow setting hub ID numbers from 1 to 64. The six rockers correspond to six digits of a binary number (2ud, 2ud, 2ud, 2ud, 2ud, and 2ud which have the values 1, 2, 4, 8, 16, and 32 respectively).

**NOTE:**

Counting with binary numbers proceeds as follows - 00001, 00010, 00011, 00100, 00101, 00110, 00111, 01000. For higher numbers, you add the selected values together; for example, to represent the number 50, the binary number would be 11010 (32 + 16 + 2).

3. Set the rockers on the DIP switch to select the required hub ID number. To select a position value, push the rocker to the on (1) position.

**NOTE:**

The selected hub ID will be effective when the circuit pack is inserted (with the reset that occurs when the MJU is powered up) and will be read again whenever the **RESET** button on the circuit pack is operated.

4. Repeat the procedure to set the hub ID on the other MJUs in the shelf.
-



---

## Change NPC Type, IW, or ALMOPT-AIS

# 3.30

---

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to change an NPC's line format type, the NPC IW (insertion word), and the AIS alarm status.                                                                                                                                                                                                                                                                                                   |
| <hr/>                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Before you Begin</b>    | <p>The insertion word is sent on unassigned (not-connected) channels and all channels when the NPC is removed from service to indicate these conditions to the far-end equipment.</p> <p>To change the IW, the NPC type specification must be reentered in the command.</p> <p>Whenever the NPC type is changed, all programmable alarm thresholds revert to default values and may also have to be changed.</p> |
| <hr/>                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> .                                                                                                                                                                                                                                                                                                                                     |
| <hr/>                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Instructions

Use this procedure to change the NPC type, insertion word, or AIS alarm status.

1. Enter **RMV-EQPT::NPC-<npc No.>::[:INCL];** to remove the NPC from service.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

INCL = Optional, to allow removal when NPC carries special service circuits.

2. Familiarize yourself with the commands:

- If TYPE or IW:

**ED-PRMTR-EQPT::NPC-<npc No.>::[mnxyz][:IW-X-pq];**

- If ALMOPT AIS:

**ED-PRMTR-EQPT::NPC-<npc No.>[&&[&]-<range>]::[mnxyz][:ALMOPT:AIS-{INFO|MJ|MN}];**

Where:

mnxyz = Desired NPC type given by appropriate designation (mn =DE for enhanced DS1 digroup, =TE for DS1 embedded in DS3 signal) and "xyz" specification for type.

<range> = Optional, the last NPC of continuous range of NPCs.

IW-X-pq = Insertion word given as hexadecimal code; each digit specifies 4 bits. Typical IW codes are: 7F (default for types DE and DS) and 18 (for type DE, Digital Data System). Not selectable for clear-DS1 which uses AIS signal.

ALMOPT field = Allows changing the option for receipt of AIS (alarm indication signal) to INFO (information), MJ (major alarm), or MN (minor alarm).

3. Consider the following background information:

- Zero code suppression inserts 1s for adequate line drive as opposed to B8ZS for unrestricted data patterns for multiplexers (the far-end multiplexer removes B8ZS code).
- The DMI interface for digital PBXs uses both A and B signaling and 64 kb/s clear channel; it cannot be used with DDS where word 24 is needed.

4. Enter the command(s) for the desired change(s). The NPC type must be included in the command to change the IW (insertion word), but need not be entered to change just the AIS alarm option.
5. Check completion message to verify changes.
6. Enter **RST-EQPT : NPC-<npc No.>**; to restore NPC to service. DMI signaling cannot be specified in the **y** field if the **x** field is 4 (DDST framing).

**NOTE:**

For DS-type NPCs only, all cross-connects must be disconnected before the NPC's type can be changed because the NPC must be deleted from the RT in order to change the NPC types.



---

|                    |                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to change alarm thresholds for any or all the facility parameters for type DE/TE/DS and type PB/PC NPCs. |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | The threshold values must be previously established using the ED-OPT-T1 command (refer to <i>Set Optional Alarm Threshold in Data Base</i> ). |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                              |
|----------------------------|------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> . |
|----------------------------|------------------------------------------------------------------------------|

---

---

## Instructions

---

Use this procedure to change the alarm threshold.

1. Familiarize yourself with the command as follows

```
ED-PRMTR-EQPT:: {NPC-<npc No.>|  
TYPE-mnxyz}::rr/l&ss/m...&tt/n;
```

Where:

NPC or TYPE field = Selects number of NPCs to be changed:  
NPC given as extended (for example, [0]001),  
hierarchical (for example, 01-1-01), or all NPCs  
with the same type specification (mnxyz).

rr/l,ss/m = Listing of any of the associated alarm types (01  
through 10 and 31 through 40) and predefined  
number (0 through 3 or 0 through b) which  
selects alarm threshold. Monitoring of a  
parameter can be disabled by entering a "c" for  
the alarm threshold.

2. See the following example of the command in which new major alarm options are being selected for ERS and SLIPS.

EXAMPLE: **ED-PRMTR-EQPT::NPC-012::01/1&03/2;**

3. Obtain or determine information needed for command. You can enter **RTRV-OPT-T1::NPC::[{mn|ALL}]**; to see the actual option values that have been established in the data base for all the NPCs.
  4. Enter command with required information.
  5. Check the output message to confirm that the information was entered correctly.
-

---

**When to Use**

Use this procedure to change the subrate ECLOC. Error correction is provided by the MJU or SRM circuit pack. Error correction should be assigned to the circuit pack with the most free space (an office with mostly two-point circuits would normally set ECLOC to the MJU circuit pack).

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to change the the subrate ECLOC.

1. Enter **ED-PRMTR-NE:::ECLOC:{MJU|SRM};**



**NOTE:**

If the DNY message first line ends with {INERR|SYNTAX}2LN MSG, enter the command again. The input command has an error in it. The second line of the DNY message contains two equal signs (= =). The information within the equal signs is not acceptable.

---



---

|                    |                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to display the spare bits in TS0 (time slot 0) which are monitored and to set/change the monitoring. |
|--------------------|-------------------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before you Begin</b> | <p>The normal state (0 or 1) of the monitored bits must have been previously set by the <b>ED-PRMTR-EQPT : :NPC-01-1-1 : TS0M-11011111</b>; command.</p> <p>When a change of state occurs, the DACS II issues a REPT STATE ...TS0-R BITS information. If bits 3, 4 or 5, was assigned an alarm meaning when the NPC was grown, it will generate REPT STATE ...AR01 MISC PBA messages when the state changes. Those bits which were assigned when the NPC was grown cannot be selected for monitoring in this procedure.</p> |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                              |
|----------------------------|------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> . |
|----------------------------|------------------------------------------------------------------------------|

---

## Instructions

---

Use this procedure to query or change TS0 bit monitoring.

1. What procedure do you want to perform?
  - If you want to see which bits are currently being monitored, continue with Step 2.
  - If you want to change the TS0 monitoring, proceed to Step 4.

2. Enter the command to retrieve the monitoring as follows:

**RTRV-STATE-EQPT::NPC-<npc No.>[&&[&]-<range>]::TS0M;**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, last NPC of continuous range of NPCs. Extra ampersand (&) needed for hierarchical.

3. Read the bit monitoring of TS0 bits designated abcdefgh as follows: 0 for no monitoring and 1 for monitoring. This information appears under the TS0M caption line in the message.



**NOTE:**

The defaults are 00000000 (for all types except TRANSMIC 1G) and 00111111 (for TRANSMIC 1G).

4. To change the monitoring, enter the command as follows:

**ED-PRMTR-EQPT::NPC-<npc No.>[&&[&]-<range>]::TS0M-  
abcdefgh;**

Where:

- abcdefgh = Represents 8 TS0 bits. Make entry for each bit as follows: 0 for no monitoring, 1 for monitoring, and dash (-) for no change.

A dash or the value assigned during the NPC growth procedure must be entered for bits 3, 4 and 5 if these bits were assigned alarm meanings.

5. Check the OLD and NEW fields in the output message to verify that the information was entered correctly.
-

---

**When to Use**

Use this procedure to remove NPC(s) (network processing circuits) 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.

---

**Related  
Information**

For additional information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to remove and degrow an NPC.

1. To list all plug-ins enter:

**RTRV-STATE-EQPT : : [UNIT- [q]q] : : EQPD;**

To list common plug-ins (no NPCs) enter:

**RTRV-STATE-COM : : : EQPD;**

After response enter **RTRV-STATE-EQPT : : [UNIT- [q]q] : : OOS;**

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-EQPT : : 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, 01-1-01).

<range> = Use only for FTU (facility terminating unit). Three ampersand (&s) are required for hierarchical.

SIDE s = Use for DSPU (digital signal processing unit) NPC.

INCL = Use if special service CONNs exist.

4. If the NPC is going to be degrown, continue with Step 5.
  - If not, this procedure is completed.
5. Enter **RTRV-CRS-T1 : : <npc No.>[&&[&-]<range>] : : MAP;**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional; to specify last NPC of continuous range. Three ampersand (&s) and a dash (-) are required for hierarchical.
- If there are any cross-connections on the NPCs, refer to *Cross-Connections and Disconnections General Tasks* to disconnect the DS0 channels or clear-DS1s and then continue with this procedure.
  - If there are any test access cross-connections, enter **DISC-TACC-T0:::kk[:00S]**; for test access to make disconnections.
6. If NPC was used for substrate data connections, enter **RTRV-STATE-TS::<npc No.>-ddd[&&-eee]**; to see if any channels are established to substrate.
- If any channels are established to substrate, refer to *Provisioning General Tasks* to disestablish the channels and then continue with this procedure.
7. If subject NPC is the test port digroup (NPCTP designation), enter **DISC-EQPT::NPC-<npc No.>:NPCTP-n[:TPR]**; to remove the TP designation (TPR word releases and degrows any test ports).
8. Enter **DISC-EQPT::NPC-<npc No.>[&&[&]-<range>]**;
-



---

## Establish DS1 Facility (without *SLC*® Carrier)

# 3.35

---

### When to Use

Use this procedure to do the following:

- Check far-end installation
- Make DSX-1 connections
- Remove loops
- Perform alarm tests and end-to-end tone tests.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

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### Tasks

| Step | Action                                                                | Reference                |
|------|-----------------------------------------------------------------------|--------------------------|
| 1    | Check far-end installation, make DSX-1 connections, and remove loops. | SE 3.30.1    page 3.35-3 |
| 2    | Perform end-to-end alarm tests.                                       | SE 3.30.2    page 3.35-5 |
| 3    | Check facility status and perform end-to-end tone tests.              | SE 3.30.3    page 3.35-7 |

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### **SE 3.30.1: Check Far-End Installation, Make DSX-1 Connections, and Remove Loops**

Use this procedure to check far-end installation, make DSX-1 connections, and remove loops.

1. Verify that far-end terminal equipment has been equipped and tested and verify that digital line has been established and tested.
2. Verify that far-end voice terminal has been optioned for looped timing (from DACS II) or external timing from office clock.
3. Use office records to determine the DACS II and DSX-1 jack appearances to be cross-connected.
4. Insert dummy plugs (258 plugs or 800-series DSX cord plugs) in the **MON** jacks of the two sets of jacks to be cross-connected. This should light the **TL** lamps and help locate the position from behind the bay.
  - If the **TL** lamp for each jack set is lighted, proceed to Step 6.
  - If the **TL** lamp is not lighted, continue with Step 5.
5. With VOM, check for 48 "" across the **TL** lamp which is not lighted.
  - If 48 "" lamp.
  - If 48 "" fuse at top of DSX-bay and **TL** lamp per cross-connect schematic in Volume I, Chapter 3.
6. Review the following guidelines on running cross-connections: Leave at least 8 inches of slack on short runs. Dress wires through fanout at bottom of panel. Run wires in horizontal or vertical troughs (top and bottom troughs for interbay) and remember the 85-foot limit.
7. Which type DSX-bay do you have?
  - If **BACK PANEL X-CONN FIELD**, continue with Step 8.
  - If **FRONT PANEL (800-SERIES)**, proceed to Step 9.
8. Make cross-connections between subject jack sets using Y1-type wire (see Note). Proceed to Step 10.



**NOTE:**

The DSX-panel may be several different size panels and have different jack types. Fortunately, only the orientation of the pins will differ in these cases; the pin numbers will be the same.

9. Make wire-wrap connections between jack sets using five conductors of the cross-connect wire.

10. Remove one of the dummy plugs.
    - If both **TL** lamps remain lighted, remove other dummy plug.  
***Response:*** Both lights will go off.
    - If both **TL** lamps do not remain lighted, make corrections to wiring.
  11. Record relay rack or other jack set identification on DSX-panel designation strip.
  12. At DSX-1 bay, remove line feed signal and termination on line side jacks and remove looping cords from DACS II side jacks.
  13. Verify that facility alarms clear on added NPCs after alarm time-out period (approximately 15 seconds).
-

## SE 3.30.2: Perform End-to-End Alarm Tests

### Procedure

Use this procedure to perform an end-to-end test. In this test, the receive line signal is interrupted to cause a local alarm (CGA at the DACS II and to send a remote alarm signal to the other end. The alarms clear after a time-out period when the alarm condition is removed. As a final test, the receive signal is interrupted at the other end to check the local and remote alarm responses in the other direction.

1. Contact the far-end office to arrange for the test.
2. At DSX-1 jacks, place a dummy plug (or loose cord end) into the **OUT** jack of digital line coming to the DACS II.
3. Press **ACO** button on DACS II status panel.
  - If the MJ (major) alarm is registered on status panel and by AR01, MISC ALM output message, proceed to Step 6.
  - If neither alarm indication occurs, verify that the dummy plug is installed in the correct jack and that the alarm is not appearing on another facility due to a wiring error, proceed to Step 4.
4. If neither indication occurred and there is no connection problem, install cord (loop) between IN and OUT jacks for the DACS II and wait for alarm to clear. Then enter **RMV-EQPT : NPC-<npc No.> : [ : INCL ]**; replace NPC pack, enter **RST-EQPT : NPC-<npc No.>**; and remove looping cord.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

INCL = Optional, to remove NPC with special services (CUS or RDLD).

5. If status panel indication does not occur, check status panel lamp test. If lamp is good, enter **RMV-EQPT : MC**; , replace the MTC pack, and reset the DACS II at the status panel by holding **RESET ENABLE** to **ON** and momentarily pressing the **RESET** button.
6. If far end has a Y remote alarm indication, proceed to Step 8.
  - If far end does not have a remote alarm indication, have far end check that alarm is not appearing on another facility. If it does occur elsewhere, have far end correct wiring error.
7. If no alarm occurs at far end, proceed as follows for type of far-end equipment. For voice terminal, have far end perform looped alarm test per documentation. For DACS II, have far end replace NPC per method in Step 4.

8. Remove dummy plug installed at beginning of this test.

**Response:** The alarms will clear after the time-out period of approximately 20 seconds.

9. Have far end place the terminal in a local alarm condition either by inserting a plug into the line jack or by disconnecting or failing the receive unit at the voice terminal.
  10. If local alarm is obtained at far end and if Y remote alarm is received at near-end DACS II, continue with Step **11**.
    - Perform corrective action for the particular alarm not occurring as outlined for the first direction of testing in this procedure.
  11. Have far end remove local alarm condition and verify that the alarms clear after the time-out period of approximately 20 seconds.
-

### SE 3.30.3: Check Facility Status and Perform End-to-End Tone Tests

#### Procedure

Use this procedure to

1. Enter **RTRV-STATE-EQPT: :NPC-<npc No.>[&&[&]-<range>];**

Where:

- <npc No.> = NPC number, given either as extended (for example, [0]001) or hierarchical (for example, 01-1-01) .
- <range> = Optional, for facility NPCs to name last NPC of range. Three ampersand (&s) are required for hierarchical.

2. Which type NPC are you querying?
  - If **TYPE DE or TE**, read the meaning of the NPC type options and continue with Step 3.
  - If **TYPE MB, MJ, or SR**, proceed to Step 6.
3. Notice the not-connected code IW. Typical values are:  
7F (unassigned channel code, default), FF (all 1s), and 18 for Digital Data System.
4. Read the status and facility error counts from the fields of the output message.
5. If any NPC type, IW, or alarm thresholds must be changed, refer to the appropriate procedure (*Change NPC Type, IW, or ALMOPT-AIS* or *Change Alarm Threshold*) to make changes. The procedure to check facility status has been completed.
6. Read the NPC types as follows: type MB100 is for the digital multipoint bridge, type MJ100 is for multipoint junction unit for subrate data, and type SR100 is for subrate multiplexer.
7. Look for "1s" under the out-of-service, failed, and pested headings; a zero means the condition does not exist and a 1 means it does exist. The conditions of the NPCs on both sides of the DSPU are given.
8. If channel tests are to be performed on facility channels, notify test personnel that the circuit can be tested.
9. 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.

- Match the 0s and 1s with options. Only bits a through g (for Hex digits xy) are used in the basic 2.048-Mb/s Interface feature.
10. 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.
  11. Read the status and facility error counts from the fields of the output message.

**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.

12. If any NPC type, insertion word, or alarm thresholds must be changed, refer to the appropriate procedure (*Grow NPCs (Part of MXRs)* or *Restore NPCs*) to make the change.
  13. If channel tests are to be performed on facility channels, notify test personnel that circuit can be tested.
-

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**Establish *SLC*® 96 Carrier System  
Mode I or *SLC*® Series 5 Carrier  
System FPB (Feature Package B)**

# 3.36

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**When to Use**

In this procedure, you will be equipping the NPC slots for the lines going to the RT, the DCLU, and the nonswitched voice terminal. If protection switching is provided, the NPCs for the protection line are also equipped. There is no protection line between the DCLU and DACS II.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to establish *SLC* 96 carrier system mode I or *SLC* Series 5 carrier system Feature Package B.

1. Verify the NPCs have been grown per specifications below. If NPCs have not been grown refer to *Install circuit packs and Grow IFTU2 NPC (with SLC Carrier)*.
  - For RT Line, specify Type DS and line format (ZCS option required).
  - For DCLU Line, specify Type DS and line format required for DCLU.
  - For voice terminal line (TG80, TG80B, TG183), specify Type DE and line format.
2. Verify that the RT has been loop tested and verify that the digital line has been established and tested.



**NOTE:**

If fault locate levels for single-ended testing from the office must be recorded, they can be obtained after the protection line is established in this procedure.

3. Use the specifications listed below to correlate the NPC(s) with the digroups at both the remote terminal and the DCLU. Enter  
**ED-PRMTR-EQPT : : [DGA-aaa, DGB-bbb, DGC-ccc,  
DGD-ddd, DGP-ppp] : : {RT|DL}-ffff, g[g] : [{sss|NDL|RTF}]; .**
  - If all the NPCs for the primary digroups of the RT or DCLU are ready for assignment, you can enter the NPC numbers at one time in the DGA through DGD fields of the **ED** (add) command. Otherwise, only use the digroup fields for the NPCs to be added. If the protection facility is going to be established, use the DGP field to enter the associated NPC.
  - For *SLC* 96 carrier, determine whether the NDL option is needed to disable the data link in digroup A, and determine if a miscellaneous alarm must be specified instead of the default power minor alarm.
  - The same ID number must be used for both RT and DCLU in *SLC* 96 Mode I and *SLC* Series 5 FPB.
  - For *SLC* Series 5 carrier, different RT IDs must be used for two banks on the same RT shelf to avoid or prevent problems in RT data base. Do not assign both the “blue” and “white” banks with the same ID.



Where:

- RT|DL = Selects either remote terminal (RT) or DCLU (DL) as the type of connecting equipment. The DCLU does not have a DGP.
- ffff = RT or DCLU identifier.
- g = Mode: 1 for *SLC 96 Mode I* and *SLC Series 5 FPB*.
- aaa,bbb,ccc, = NPC numbers to be assigned to digroups
- and ddd = A, B, C, and D.
- ppp = NPC number to be assigned to protection facility if provided.
- sss = For *SLC 96* digroup A to specify power or miscellaneous alarm as follows: PMN (power-minor alarm, default if single RT is used at the site) or PMJ (power-major alarm) or MMJ or MMN for major or minor miscellaneous alarm.
- NDL = Optional, for *SLC 96* carrier to disable use of data link with digroup A.
- RTF = Optional, for *SLC Series 5* digroup A to assign retrofit status to the system which prevents the DACS II from overwriting (clearing) the RT channel provisioning. The RTF status must be changed after the channel provisioning is loaded into the DACS II to allow DACS II auditing.

4. Check output message to verify correct entry of information.
5. If you want to familiarize yourself with the query to list the NPC to RT association, enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG**; for one of the NPCs.
6. At DSX-1 bay, make wiring cross-connections (*Make DSX-1 Connections*) between line jacks (to RT, DCLU, and D-bank) and NPC jacks. If used, looping cords (at DSX-1 and far end) should not be removed until Step 10.
7. Enter **RST-EQPT::<npc No.>[&&[&]-<range>]:;** to restore NPC(s) for the lines to the RT and DCLU.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, to name the final NPC when it is desired to restore a continuous range of IFTU2-NPCs. Extra ampersand (&) needed for hierarchical.



**NOTE:**

The restore operation causes diagnostics to be run on the NPCs and changes the NPC status to in-service.



**NOTE:**

If consecutive NPCs are used for the digroups, all of them can be restored in single range command. Otherwise, the NPCs for DGA can be restored in one command and those for DGP can be restored in one command.

8. Verify that the DCLU has been equipped and tested.
9. Enter CONN CRS1 commands to connect lines for digroups A through D through DACS II to the DCLU. Refer to *Cross-Connections and Disconnections*.
10. When the DCLU and RT are ready for end-to-end facility tests, assist as required by removing DSX-1 bay looping cords.
11. Do the following steps to test the protection switching:
  - a. Enter **SW-TOPROTN-T1::NPC-<npc No.>::[:INCL]**  
Where: INCL = Needed to switch DGA.



**NOTE:**

There will be an SC ALM MN message indicating the switch has occurred.



**NOTE:**

If DGA is switched, the protection line will register timing slips because it derives timing from DGA. These slips must be (if mml) cleared by entering **INIT-REG::NPC-<npc No.>::SLIP;;**.

- b. Verify that CGA message is not received on line which has been switched onto protection. The RT will have an **ACU MN** and a **LINE ON PROT** indication on the subject LIU.
- c. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**  
Where: <npc No.> = The same NPC number.
- d. Observe the following in the query output message:

Presence of SWMR (for manual switch) under the switched digroup; the other digroups will be in the NORM (normal state) or INHB (inhibited).

Presence of MNNE (minor alarm near end) for the ALST (alarm state) under the switched digroup.

- e. If the listed protection switch indications were obtained, enter **SW-TOWKG-T1::NPC-<npc No.>::[:INCL];** to terminate the protection switch.

If the protection switch indications were not obtained, proceed to Step **11g**.

- f. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**. Observe that NORM (for switch normal) appears for PLSW (protection line switching) for the digroup. The procedure to test protection switching has been completed.



**NOTE:**

There will also be an SC ALM IDLD message showing that the near-end minor alarm has cleared.

- g. Notice whether there is an SC ALM MJ message for digroup A which would indicate that the *SLC* Carrier System data link is inoperative. The data link must have been enabled when the **ED RT** was entered.
- h. At DACS II, enter commands to remove both NPCs on the dual digroup card, replace the card, and enter commands to restore the NPCs. If the trouble persists, have tester at RT replace the LIU (line interface unit) pack and other packs that would affect transmission.
12. If you want to check the status of any facility at DACS II, enter **RTRV-STATE-EQPT::NPC-<npc No.>;**  
Where: <npc No.> = NPC for the facility.
13. If initial levels for single-ended fault locating must be recorded, one line can be put up on protection (**SW PROTN** command) and fault locate test set can be used at the DSX-1 in the DACS II office (*Operate SLC Carrier System Protection Switch or Line Loopback*).
14. Verify that D Bank or other voice terminal in the office (for nonswitched special circuits) has been installed and loop tested.
15. Verify that the NPC for the same voice terminal has been installed and grown. Enter **RST-EQPT::<npc No.>[&&[&]-<range>];;**
16. Remove line signal loops at the DSX-1 jacks. Facility alarms will clear after alarm time-out period of approximately 15 seconds.

17. If alarm test with office channel bank is required, perform end-to-end alarm test with voice terminal (see *Perform End-to-End Alarm Tests*).
  18. If information is available for the connection of the special service channels through the DACS II, enter the **CONN CRS** commands for those channels (refer to *Cross-Connections and Disconnections*).
  19. If channel tests are to be performed on facility channels, notify circuit test personnel that the circuit can be tested.
  20. If timing SLIPs have not been cleared on the protection line, enter **INIT-REG: :NPC-<npc No.>**; for the protection digroup.
  21. Update office records with facility information and notify circuit provisioning center of completion.
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**Establish SLC<sup>®</sup> 96 Carrier System  
Mode III**

# 3.37

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**When to Use**

Use this procedure to equip the NPC slots for the lines going to the RT and the office terminal. If protection switching is provided, the NPCs for the protection line are also equipped.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

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## Instructions

Use this procedure to establish SLC 96 carrier system mode III:

1. Verify the NPCs have been grown per specifications below. If NPCs have not been grown, refer to *Install circuit packs and Grow IFTU2 NPC (with SLC Carrier)*.
  - For lines going to the RT, specify Type DS and line format (ZCS option required for SLC 96 carrier).
  - For lines going to office equipment, specify Type DE and line format required for connecting equipment.
2. Verify that the RT has been loop tested and verify that the digital line has been established and tested.



**NOTE:**

If fault locate levels for single-ended testing must be recorded, they can be obtained after the protection line is established in this procedure.

3. Correlate the NPC(s) with the digroups at the remote terminal using the specifications listed below. Enter  
**ED - PRMTR - EQPT : : [DGA - aaa, DGC - ccc, DGP - ppp] :**  
**: RT - ffff, g[g] : [{sss | NDL}] ;**
  - If all the NPCs for the primary digroups of the RT are ready for assignment, you can enter the NPC numbers at one time in the DGA through DGC fields of the **ED** (add) command. Otherwise, only use the digroup fields for the NPCs to be added. If the protection facility is going to be established, use the DGP field to enter the associated NPC.
  - Determine whether the NDL option is needed to disable the data link in digroup A, and determine if a miscellaneous alarm must be specified instead of the default power minor alarm.
  - SLC 96 Mode III only supports digroups A, C, and P.

Where:

RT = Remote terminal (RT).  
 ffff = RT identifier.  
 g = 3 for SLC 96 Mode III.  
 aaa,ccc = NPC numbers to be assigned to digroups A, and C.

- RT = Remote terminal (RT).
- ppp = NPC number to be assigned to protection facility if provided.
- sss = For SLC 96 digroup A to specify power or miscellaneous alarm as follows: PMN (power-minor alarm, default if single RT is used at the site) or PMJ (power-major alarm) or MMJ or MMN for major or minor miscellaneous alarm.
- NDL = Optional, for SLC 96 carrier to disable use of data link with digroup A.

4. Check output message to verify correct entry of information.
5. If you want to familiarize yourself with the query to list the NPC to RT association, enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG;** for one of the NPCs.
6. At DSX-1 bay, make wiring cross-connections (*Make DSX-1 Connections*) between line jacks (to RT and office D-bank) and NPC jacks. If used, looping cords (at DSX-1 and far end) should not be removed until Step 8.
7. Enter **RST-EQPT::<npc No.>[&&[&]-<range>];;** to restore NPC(s) for the lines to the RT.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01) .
- <range> = Optional, to name the final NPC when it is desired to restore a continuous range of IFTU2-NPCs Extra ampersand (&) needed for hierarchical.



**NOTE:**

The restore operation causes diagnostics to be run on the NPCs and changes the NPC status to in-service.



**NOTE:**

If lines are already connected through DSX-1, **remove digroups in sequence** (DGP, DGA, then others) to cause switching and to simulate service cutover.

8. For lines going to the RT, remove line signal loops (if provided) and verify alarm indications using the following steps.

**NOTE:**

The loops are removed systematically (DGP, DGA, then others) to control alarm indications and to cause switch to protection. This sequence would also be used for cutover of in-service facilities.

- a. Contact the far-end office to arrange for the test.
- b. If protection switching is provided for the facilities to the RT, have tester remove looping card (at RT) from **TST** jack of **PROT LIU** and watch for **MN** alarm on **ACU** and **FAIL** and **PROT** indications on LIU. At DSX-1 bay, remove line feed signal going toward the RT and remove the looping cord on the DACS II side.

If protection switching is not provided, proceed to Step **8d**.

**NOTE:**

Until digroup A is connected through, the DACS II will register SLIPs because the RT is trying to get timing from digroup A.

- c. If ACU MN clears at RT after looping cord is removed, continue with Step **8d**.

If ACU MN does not clear at the RT after looping cord is removed, find and correct wiring problem between the equipment and cable pairs at either end. Check whether alarm conditions have changed on another facility to determine if cable pairs have been wired to wrong equipment. After trouble is cleared, repeat the test procedure.

- d. At RT, have tester remove looping card from **LIU A TST** jack and monitor alarm indications.
- e. At DSX-1 bay, remove signal looping cord from the facility going to RT digroup A. Also remove any line feed signal and termination applied on the line-side jacks.

**Response:** The DACS II may show a CGA ...Y CLF message on the facility because of the signal interruption.

- f. If the following indications occur at the RT and then clear (after approximately 20 seconds), proceed to Step **9**.

With protection: **MN** at ACU; **RCV LINE FAIL** and **LINE ON PROT** at LIU A

Without protection: **MJ, A, FE** at ACU; **RCV** at TRU A; and **RCV LINE FAIL** at LIU A

If the indications do not occur at the RT, continue with Step **8g**.



- g. If the protection switch did not operate but alarms occurred as with no switching, verify that the **ED RT** command was entered with data link enabled and that switching is not inhibited at the RT. Continue with procedure to check cabling for each digroup; the protection switching will be tested in Step 10.
  - h. If the alarms do not occur or occur on the wrong facility, find and correct wiring problem between the equipment and cable pairs at either end. After trouble is cleared, repeat from Step 8a.
  - i. Repeat Step 8 for digroup C.
  - j. Enter **INIT-REG::NPC-<npc No.>:SLIP;** for protection line to clear timing slips.
9. If alarm test with office channel bank is required, perform end-to-end alarm test (see *Perform End-to-End Alarm Tests*).
10. Test the protection switching using the following steps:
- a. Enter **SW-TOPROTN-T1::NPC-<npc No.>::[:INCL]** to initiate the protection switch.  
Where: INCL = Needed to switch DGA.

**NOTE:**

There will be an SC ALM MN message indicating the switch has occurred.

**NOTE:**

If DGA is switched, the protection line will register timing slips because it derives timing from DGA. These slips must be cleared by entering **INIT-REG::NPC-<npc No.>:SLIP;**.

- b. Verify that CGA message is not received on line which has been switched onto protection. The RT will have an **ACU MN** and a **LINE ON PROT** indication on the subject LIU.
- c. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>:SCDG:STATE;**  
Where: <npc No.> = The same NPC number.
- d. Observe the following in the query output message:  
Presence of SWMR (for manual switch) under the switched digroup; the other digroups will be in the NORM (normal state) or INHB (inhibited)  
Presence of MNNE (minor alarm near end) for the ALST (alarm state) under the switched digroup

- e. If the listed protection switch indications were obtained, enter **SW-TOWKG-T1::NPC-<npc No.>::[:INCL]**; to terminate the protection switch.

If the protection switch indications were not obtained, proceed to Step **10g**.

- f. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**. Observe that NORM (for switch normal) appears for PLSW (protection line switching) for the digroup. Proceed to Step **11**.

**NOTE:**

There will also be an SC ALM IDLD message showing that the near-end minor alarm has cleared.

- g. Notice whether there is an SC ALM MJ message for digroup A which would indicate that the *SLC* Carrier System data link is inoperative. The data link must have been enabled when the **ED RT** was entered..
- h. At DACS II, enter commands to remove both NPCs on the dual digroup card, replace the card, and enter commands to restore the NPCs. If the trouble persists, have tester at RT replace the LIU pack and other packs that would affect transmission.

- 11. Test the power/miscellaneous alarm sent from the RT using the following steps.

- a. Arrange to have tester at RT send alarms.

**NOTE:**

If there is only one RT at the remote site, the power MN (PMN) or power MJ (PMJ) alarm will be sent in the miscellaneous alarm field of the data link. If there are two RTs at the site, the power alarm is sent for the first RT and a miscellaneous alarm (for example, door open) can be sent for the second RT. For RT huts with several RTs, the miscellaneous alarms can signal hazards (fire, water, gas), but only the power and door-open conditions are checked here.

- b. Have tester turn off the AC power supply. This will not interrupt service because of the backup battery supply.

**NOTE:**

DO NOT turn off the AC power supply unless backup battery supply is known to be functioning or service will be interrupted.

If SC ALM PMN/PMJ message is received at the DACS II, have tester at RT turn on AC power.

If the PMN alarm is not received, the power sensing circuit at the RT is suspect since the data link of DGA has already been used for protection switching tests. However, if there is an MJ alarm on DGA or if protection switching has not been tested, either the NPC at DACS II or the DGA pack(s) at the RT can be causing trouble.

- c. If there are two RTs at the remote site, continue with Step **11d**.

If there are not two RTs at the remote site, proceed to Step **12**.

- d. Have tester activate door alarm switch that is normally disabled when the RT site is entered.

If SC ALM MMN or MMJ message is received from second RT, proceed to Step **11**.

If the MMN or MMJ alarm is not received, enter

**RTRV-PRMTR-EQPT::[NPC-<npc No.>]::SCDG;;** for the system.

- e. Look for MMN or MMJ in the field that follows the mode (MD) field.

If PMN appears, enter

**ED-PRMTR-EQPT:::RT-ffff:sss;**

to change the alarm definition.

If PMN does not appear and the miscellaneous alarm was defined, the RT door-open circuit is suspect.

Where:

ffff = Bank identification number of connecting RT for which the alarm meaning is to be changed.

sss = Required new meaning given by one of the following:

PMN for power minor alarm (default and required for one RT at site),

PMJ for power major alarm,

MMJ for miscellaneous major alarm, or

MMN for miscellaneous minor alarm.



**NOTE:**

The power or miscellaneous alarm is carried over the data link on DGA; so, the NDL (no data link) must not have been used when the ED (add) DGA command was entered. The miscellaneous alarm indicates flooding, fire, or gas at the RT site. This alarm can be used for the second RT bank at the site; the power alarm is used for the first RT bank.

- f. Deactivate the door alarms.
12. If you want to check the status of any facility at DACS II, enter  
**RTRV-STATE-EQPT::NPC-<npc No.>;**  
Where: <npc No.> = NPC for the facility.
13. If initial levels for single-ended fault locating must be recorded, one line can be put up on protection (SW PROTN command), the far end looped back, and then the fault-locate test set used at the DSX-1 bay (see *Operate SLC Carrier System Protection Switch or Line Loopback*).
14. Verify that D Bank or other voice terminal in the office (for nonswitched special circuits) has been installed and loop tested.
15. Verify that the NPC for the same voice terminal has been installed and grown.
16. Enter **RST-EQPT::<npc No.>[&&[&]-<range>]:;!** to restore the NPC for the same voice terminal.
17. Remove line signal loops at the DSX-1 jacks. Facility alarms will clear after alarm time-out period of approximately 15 seconds.
18. If alarm test with office channel bank is required, perform end-to-end alarm test with voice terminal (see *Perform End-to-End Alarm Tests*).
19. If information is available, enter CONN CRS1 commands to connect channels through DACS II. Refer to *Cross-Connections and Disconnections*

**NOTE:**

If information for circuits is not available, all 24 digroup channels can be connected through to enable preliminary channel tests.

20. If channel tests are to be performed on facility channels, notify circuit test personnel that the circuit can be tested.
21. If timing SLIPs have not been cleared on the protection line, enter **INIT-REG::NPC-<npc No.>;** for the protection digroup.
22. Update office records with facility information and notify circuit provisioning center of completion.
-

---

**Establish New *SLC*® Series 5 Carrier  
System Feature Package C (FPC)**

**3.38**

---

**When to Use**

Use this procedure to equip the NPC slots for the lines going to the RT and the nonswitched voice terminal. If protection switching is provided, the NPCs for the protection line are also equipped.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to establish new SLC Series 5 carrier system feature package C.

1. Verify the NPCs have been grown per specifications below. If NPCs have not been grown, refer to *Install circuit packs and Grow IFTU2 NPC (with SLC Carrier)*.
  - For RT Line, specify TYPE DS and line format.
  - For line going to office equipment, specify TYPE DE and line format required for connecting equipment.
2. Verify that the RT has been loop tested, that the looping cards are installed, and verify that the digital line has been established and tested.



**NOTE:**

If fault locate levels for single-ended testing must be recorded, they can be obtained after the protection line is established in this procedure.

3. If establishing new facility, use the specifications listed below to correlate the NPC(s) with the digroups at the remote terminal.

Enter **ED-PRMTR-EQPT** : : \

**[DGA-aaa, DGB-bbb, DGC-ccc, DGD-ddd, DGP-ppp]** : : \

**RT-ffff,g[g];**.

- If all the NPCs for the primary digroups of the RT are ready for assignment, you can enter the NPC numbers at one time in the DGA through DGD fields of the ED (add) command. Otherwise, only use the digroup fields for the NPCs to be added. If the protection facility is going to be established, use the DGP field to enter the associated NPC.
- Digroup pairs (A and B) and (C and D) must be added together in the same command(s) because they are associated in the RT controller. If the restoral of the mate to a pair is delayed, a COMP MN alarm will occur.
- Different RT IDs must be used for two banks on the same RT shelf to avoid problems in RT data base. Do not assign both the "blue" and "white" banks with the same ID.

Where:

FT-ffff = Remote terminal (RT) identifier.

- g = Mode: C for Series 5 FPC.  
aaa-ddd = NPC numbers to be assigned to digroups A, B, C, and D.  
ppp = NPC number to be assigned to protection facility if provided.
4. Check output message to verify correct entry of information.
  5. If you want to familiarize yourself with the query to list the NPC to RT association, enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG;** for one of the NPCs.
  6. At DSX-1 bay, make wiring cross-connections (see *Make DSX-1 Connections*) between line jacks (to RT and office voice terminal) and NPC jacks. If used, looping cords (at DACS II and far end) should not be removed until Step 8.
  7. Enter **RST-EQPT::NPC-<npc No.>[&&[&] -<range>];** to restore NPC(s) for the lines to the RT.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).  
<range> = Optional, to name the final NPC when it is desired to restore a continuous range of IFTU2-NPCs.



**NOTE:**

The restore operation causes diagnostics to be run on the NPCs and changes the NPC status to in-service.



**NOTE:**

If lines are already connected through DSX-1, restore digroups in sequence (DGP, DGA, then others) to cause switching and to simulate service cutover.



**NOTE:**

Digroup pairs (A and B) and (C and D) must be restored one after another to prevent COMP MN RT alarm.

8. For lines going to the RT, remove line signal looping cards (if provided) and verify alarm indications.



**NOTE:**

The loops are removed sequentially (DGP, DGA, then others) to control alarm indications and to cause switch to protection. This sequence would also be used for cutover of in-service facilities.

9. If alarm test with office channel bank is required, perform end-to-end alarm test (see *Perform End-to-End Alarm Tests*).
10. Do the following steps to test the protection switching:
  - a. Enter **SW-TOPROTN-T1::NPC-<npc No.>::[:INCL]**

Where: INCL = Needed to switch DGA.



**NOTE:**

There will be an SC ALM MN message indicating the switch has occurred.



**NOTE:**

If DGA is switched, the protection line will register timing slips because it derives timing from DGA. These slips must be cleared by entering **INIT-REG::NPC-<npc No.>::SLIP; .**

- b. Verify that CGA message is not received on line which has been switched onto protection. The RT will have an **ACU MN** and a **LINE ON PROT** indication on the subject LIU.
  - c. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**  
Where: <npc No.> = The same NPC number.
  - d. Observe the following in the query output message:
    - Presence of SWMR (for manual switch) under the switched digroup; the other digroups will be in the NORM (normal state) or INHB (inhibited).
    - Presence of MNNE (minor alarm near end) for the ALST (alarm state) under the switched digroup.
  - e. If the listed protection switch indications were obtained, enter **SW-TOWKG-T1::NPC-<npc No.>::[:INCL];** to terminate the protection switch.
- If the protection switch indications were not obtained, proceed to Step 10g.
  - f. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE; .**

Observe that NORM (for switch normal) appears for PLSW (protection line switching) for the digroup. Proceed to Step 11.





**NOTE:**

There will also be an SC ALM IDLD message showing that the near-end minor alarm has cleared.

- g. Notice whether there is an SC ALM MJ message for digroup A which would indicate that the *SLC* carrier data link is inoperative. The data link must have been enabled when the ED RT was entered (see Step 3).
  - h. At DACS II, enter commands to remove both NPCs on the dual digroup card, replace the card, and enter commands to restore the NPCs. If the trouble persists, have tester at RT replace the LIU pack and other packs that would affect transmission.
11. Test power/miscellaneous alarm sent from the RT using the following steps:
- a. Arrange to have tester at RT send alarms.
  - b. Have tester turn off the AC power supply. This will not interrupt service because of the backup battery supply.



**NOTE:**

DO NOT turn off the AC power supply unless the backup battery supply is known to be functioning or service will be interrupted.



**NOTE:**

There will be a 4-minute delay after the AC power supply is turned off before the SC ALM PMN message is received.

If SC ALM PMN message is received at the DACS II, have tester at RT turn on the AC power.



**NOTE:**

Wait 4 minutes after turning on the AC power before proceeding to Step 11c.

If SC ALM PMN is not received, proceed to Step 11e.

- c. If there are two RTs at the remote site, have the tester activate MISC switch 1.  
If there are not two RTs at the remote site, proceed to Step 12.
- d. If MISC 1 or MISC 2 message is received from the second RT, then proceed to Step 12.

- If MISC 1 or MISC 2 message is not received, continue with Step 11e.
- e. If the PMN alarm was not received, the power sensing circuit at the RT is suspect since the data link of DGA has already been used for protection switching test. However, if there is an MJ alarm on DGA or if protection switching has not been tested, either the NPC at DACS II or the DGA pack(s) at the RT can be causing trouble.
  - f. Deactivate the MISC 1 or MISC 2 alarm.
12. If you want to check the status of any facility at DACS II, enter  
**RTRV-STATE-EQPT::NPC-<npc No.>;**
- Where: <npc No.>        =        NPC for the facility.
13. If initial levels for single-ended fault locating must be recorded, one line can be put up on protection(SW PROTN command),the far end looped back, and then the fault locate test set used at the DSX-1 bay (see *Operate SLC Carrier system Protection Switch or Line Loopback*).
14. Verify that D Bank or other voice terminal in the office has been installed and loop tested.
15. Verify that the NPC for the same voice terminal has been installed and grown.
16. Enter **RST-EQPT::<npc No.>[&&[&]-<range>]:;** to restore the NPC for the same voice terminal.
17. Remove line signal loops at the DSX-1 jacks. Facility alarms will clear after alarm timeout period of approximately 15 seconds.
18. If alarm test with office channel bank is required, perform end-to-end alarm test with voice terminal (see *Perform End-to-End Alarm Tests*).
19. If information is available for the connection of the channels through the DACS II, enter the CONN CRS commands for those channels (refer to *Cross-Connections and Disconnections*).



**NOTE:**

If information for circuits is not available, all 24 digroup channels can be connected through to enable preliminary channel tests.

20. If channel tests are to be performed on facility channels, notify circuit test personnel that the circuit can be tested.
21. If an administrative link has not been conditioned for modified Snider protocol to use the CIU (craft interface unit) at the DACS II, enter  
**ED-PRMTR-LINK::j::PTCOL-M[,ALM-k][:INIT];**

Where:

- j = Physical link number (1 through 6).
- M = Modified Snider.
- k = Alarm class; k = 2 for major alarm for hardware failure, or k = 1 for minor alarm (default).
- INIT = Optional, to initialize all parameters to default values except for those parameters entered in command.



**NOTE:**

If denial COND 04 is received, it means that the link is out-of-service and must be restored (**RST-EQPT : : LINK-j ;**) before the ED command can be done.

22. Enter **RMV-EQPT : : LINK-j ;** to remove the link from service.
23. Connect the CIU to the same administrative link and apply CIU power. Refer to the CIU User's Guide (select Code 500-206) for CIU operating instructions.
24. Enter **RST-EQPT : : LINK-j ;** to restore the link to service.
25. Enter LOAD or COPY commands at the CIU for the RT channel unit provisioning information to be loaded or copied into the DACS II data base.



**NOTE:**

Be sure to include all the provisioning from the office records because whatever is omitted will be deleted from the RT data base when the DACS II assumes control of end-to-end auditing.

26. If timing SLIPs have not been cleared on the protection line, enter **INIT-REG : : NPC-<npc No.>**; for the protection digroup.
27. Update office records with facility information and notify circuit provisioning center of completion.



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**Establish Retrofit *SLC*® Series 5  
Carrier System Feature Package C  
(FPC)**

# 3.39

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**When to Use**

Use this procedure to equip the NPC slots for the lines going to the RT and to the office terminal. If protection switching is provided, the NPC for the protection line to the RT is also equipped.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to establish retrofit SLC carrier system feature package C.

1. Verify the NPCs have been grown per specifications below. If NPCs have not been grown refer to *Install circuit packs and Grow IFTU2 NPC (with SLC Carrier)*.
  - For lines going to the RT, specify Type DS and line format.
  - For lines going to office equipment, specify Type DE and line format required for connecting equipment.
2. Enter the ED (add) command, using the specifications listed below, to correlate the NPC(s) with the digroups at the far-end remote terminal. **ED-PRMTR-EQPT : : [DGA-aaa, DGB-bbb, DGC-ccc, DGD-ddd, DGP-ppp] : : RT-ffff, g[g] : RTF ;**
  - If all the NPCs for the primary digroups of the RT are ready for assignment, you can enter the NPC numbers at one time in the DGA through DGD fields of the ED (add) command. Otherwise, only use the digroup fields for the NPCs to be added. If the protection facility is going to be established, use the DGP field to enter the associated NPC.
  - Digroup pairs (A and B) and (C and D) must be added together in the same commands(s) because they are associated in the RT controller. If the restoral of the mate to a pair is delayed, a COMP MN alarm will occur.
  - Different RT IDs must be used for two banks on the same RT shelf to avoid problems in RT data base. Do not assign both the "blue" and "white" banks with the same ID.

Where:

- RT = Selects the remote terminal as the type of connecting equipment.
- ffff = RT identifier.
- g = C for SLC Series 5 FPC.

- RT = Selects the remote terminal as the type of connecting equipment.
  - aaa-ddd = NPC numbers to be assigned to digroups A, B, C, and D.
  - ppp = NPC number to be assigned to protection facility if provided.
  - RTF = For *SLC* Series 5 carrier digroup A to assign retrofit status to the system which prevents the DACS II from overwriting (clearing) the RT channel provisioning. The RTF status must be changed after the channel provisioning is loaded into the DACS II to allow DACS II auditing.
3. Check output message to verify correct entry of information.
  4. If you want to familiarize yourself with the query to list the NPC to RT association, enter **RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG**; (for one of the NPCs).
  5. Enter **RST-EQPT::<npc No.>[&&[&]-<range>]:;** to restore NPC(s) for the lines to the RT.



**NOTE:**

The restore operation causes diagnostics to be run on the NPCs and changes the NPC status to in-service.



**NOTE:**

Digroup pairs (A and B and C and D) must be restored one after another to prevent COMP MN RT alarm.



**NOTE:**

A service interruption can occur if the correct DSX-1 jack is not used. Be sure the correct DSX-1 is being used before doing Steps 6 through 9.

6. In preparation for cutover, enter commands to cross-connect lines from Series 5 RTs to office equipment. Refer to *Cross-Connections and Disconnections General Tasks*.
7. At DSX-1, patch incoming signals from RTs and office equipment to DACS II NPC jacks. Connect to incoming signal at MON jacks so as not to interrupt service.
8. At DSX-1 bay, perform patching for service cutover using sequence that prevents loss of service.

9. At DSX-1, make wiring cross-connections to connect the RT and office equipment lines to the DACS II and then remove the patches using the method that prevents interrupting service.
10. If an administrative link has not been conditioned for modified Snider protocol to use the CIU at the DACS II, enter  
**ED-PRMTR-LINK::j::PTCOL-M[,ALM-k][:INIT];**

Where:

- j = Physical link number (1 through 6).
- M = Modified Snider.
- k = Alarm class; k = 2 for major alarm for hardware failure, or k = 1 for minor alarm (default).
- INIT = Optional, to initialize all parameters to default values except for those parameters entered in command.



**NOTE:**

If denial COND 04 is received, it means that the link is out-of-service and must be restored (**RST-EQPT::LINK-j;**) before the ED command can be done.

11. Enter **RMV-EQPT::LINK-j;** to remove the link from service.
12. Connect the CIU to the same administrative link and apply CIU power. Refer to the CIU User's Guide (select Code 500-206) for CIU operating instructions.
13. Enter **RST-EQPT::LINK-j;** to restore the link to service.
14. Enter LOAD or COPY commands at the CIU for the RT channel unit provisioning information into the DACS II data base.



**NOTE:**

Be sure to include all the provisioning from the office records because whatever is omitted will be deleted from the RT data base when the DACS II assumes control of end-to-end auditing.

15. Enter **ED-PRMTR-EQPT:::RT-ffff:RTF;** to remove the retrofit designation from the system and to initiate DACS II control and auditing.  
Where: RTF = Changes the status of the RT bank from retrofit to nonretrofit.
16. Check the output message to verify that correct information was entered. If power/miscellaneous option was changed, notice that DGA appears in the output because the alarm is conveyed over the data link on DGA.



17. If timing SLIPS have not been cleared on the protection line, enter **INIT-REG: :NPC-<npc No.>**; for the protection digroup.
  18. Update office records with facility information and notify circuit provisioning center of completion.
-



---

**When to Use**

Use this procedure to make DSX-1 connections.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to make DSX-1 connections.

1. Use office records to determine the DACS II and DSX-1 jack appearances to be cross-connected.
2. Insert dummy plugs (258 plugs or 800-series DSX cord plugs) in the **MON** jacks of the two sets of jacks to be cross-connected. This should light the **TL** lamps and help locate the position from behind the bay.
  - If the **TL** lamp for each jack set is lighted, proceed to Step 4.
  - If the **TL** lamp for each jack set is not lighted, continue with Step 3.
3. With VOM check for 48 volts across the **TL** lamp which is not lighted.
  - If 48 volts is present, replace the **TL** lamp.
  - If 48 volts is not present, clear trouble in wiring between fuse at top of DSX-bay and **TL** lamp.
4. Review the following guidelines on running cross-connections. Leave at least 8 inches of slack on short runs. Dress wires through fanout at bottom of panel. Run wires in horizontal or vertical troughs (top and bottom troughs for interbay) and remember the 85-foot limit.
5. Which type DSX-bay do you have?
  - If **BACK PANEL X-CONN FIELD**, continue with Step 6.
  - If **FRONT PANEL (800-SERIES)**, proceed to Step 7.
6. Make cross-connections between subject jack sets using Y1-type wire. See note. Proceed to Step 8.
7. (see Note). Proceed to Step 10.



**NOTE:**

The DSX-panel may be several different size panels and have different jack types. Fortunately, only the orientation of the pins will differ in these cases; the pin numbers will be the same.

8. Make wire-wrap connections between jack sets using five conductors of the cross-connect wire.
9. Remove one of the dummy plugs.
  - If both **TL** lamps have remained lighted, remove other dummy plug.  
**Response:** Both lights will go off.
  - If both lamps have not remained lighted, make corrections to wiring.

10. Record relay rack or other jack set identification on DSX-panel designation strip.
-



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## Reinitialize the CIU for Use (SLC® Series 5 Carrier)

# 3.41

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### When to Use

Use this procedure to reconnect the CIU if the test set was disconnected during use or was disconnected by DACS II, because the DACS II main controller was reset. Either of these situations causes the CIU to perform self diagnostics, and, if the diagnostics fail, the CIU must be reinitialized before it can be used again. Refer to the CIU User's Guide (Select Code 500-206) for CIU operating instructions.

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### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

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Use this procedure to reinitialize the CIU for use.

1. Turn off the CIU power switch.
  2. At DACS II, enter command to remove the administrative link for the CIU from service as follows:  
**RMV-EQPT: : LINK-j ;**.
  3. If CIU is not connected to link, connect it and turn on CIU power.
  4. At DACS II, enter command to restore CIU link to service as follows:  
**RST-EQPT: : LINK-j ;**.
    - If the diagnostics on the CIU passed, the procedure to load/copy the CIU for *SLC* carrier has been completed.
    - If the diagnostic fails, repeat the procedure.
    - If the diagnostic fails a second time, enter the command to query the link to verify that the link protocol for the CIU is M as follows:  
**RTRV-PRMTR-LINK: : j [mm] : ;**. If protocol is correct, contact technical consultant to clear trouble.
-



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## Add Protection Switching (Existing System)

# 3.42

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|                    |                                                                                   |
|--------------------|-----------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to add protection switching to an existing SLC carrier system. |
|--------------------|-----------------------------------------------------------------------------------|

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|                            |                                                                              |
|----------------------------|------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 3, <i>Provisioning</i> . |
|----------------------------|------------------------------------------------------------------------------|

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## Instructions

Use this procedure to equip the DACS II for a protection line going to the RT to the office switching equipment (for *SLC* 96 carrier Mode I or *SLC* Series 5 carrier). The NPC card for this protection line is always installed in the same DACS II facility unit (IFTU2) as the cards for the primary lines.

1. Enter **CRTE-EQPT::NPC-<npc No.>[&&[&]-<range>]::\DSxyz:[rr/s&rr/s...tt/s]:[IW-X-pq]!**  
to grow the NPC for protection line as type DS with line format specification and any alarm threshold options.

Where:

- <npc No.> = NPC number, either extended (for example, 0001) or hierarchical (for example, 01-1-01).
- <range> = Last NPC in a continuous range.
- xyz = DS1 line format and channel counting options.
- rr/l,tt/n = Optional to select any one or all alarm types (01 through 10) and previously defined options (1, 2, or 3). Shelf alarms are not selectable for *SLC* Series 5 carrier.
- IW-X-pq = Optional to specify HEX code for IW pattern either pq = FF for all 1s pattern, or pq = 7F for unassigned channel code (default value).

2. Install the circuit pack(s) for the NPC slot(s) assigned to the protection line as follows: use TG183 S96D card for *SLC* 96 carrier and Series 5 FPB, and use TG184 SS5D card for *SLC* Series 5 carrier FPC.



### NOTE:

For Mode I, the NPCs going to DGA at the RT and DCLU must be on the same dual card. There is no protection line between the DCLU and DACS II.

3. Verify that the digital line has been established and tested. Verify that patching cords are placed at the DSX-1 bay to loop back signal to the DACS II NPC.

**Table 3.42-1. Format and Channel Options**

| Option | Meaning                           |
|--------|-----------------------------------|
| X      | <b>Multiframe Format</b>          |
| 0      | Unassigned                        |
| 1      | D4 bank                           |
| 2      | ESF (extended superframe) - voice |

**Table 3.42-1. Format and Channel Options**

| <b>Option</b> | <b>Meaning</b>                             |
|---------------|--------------------------------------------|
| <b>X</b>      | <b>Multiframe Format</b>                   |
| 3             | Unassigned                                 |
| 4             | Unassigned                                 |
| 5             | Unassigned                                 |
| 6             | SLC <sup>®</sup> 96 carrier Fs format      |
| 7             | SLC Series 5 ESF with data link            |
| 8,9           | Unassigned                                 |
| <b>Y</b>      | <b>Zero Code Suppression</b>               |
| 0             | ZCS (zero code suppression)                |
| 1             | NZCS (no zero code suppression)            |
| 2             | B8ZS (bipolar with 8 zero substitution)    |
| 3-9           | Unassigned                                 |
| <b>Z</b>      | <b>Channel Counting Sequence</b>           |
| 0             | SLC 96 carrier Mode III, D4 bank sequence  |
| 1             | SLC 96 carrier Mode III, D1D bank sequence |
| 2             | SLC 96 carrier Mode I, D1D bank sequence   |
| 3             | SLC Series 5 carrier, D4 bank sequence     |
| 4-9           | Unassigned                                 |

**Table 3.42-2. Alarm Options**

| Option (rr) | Parameter                                                | Range            | Default |
|-------------|----------------------------------------------------------|------------------|---------|
| 01          | SLIP major                                               | 000* to 255      | 255     |
| 02          | SLIP minor                                               | 000* to 255      | 4       |
| 03          | Bit error rate major                                     | 10u-6d to 10u-4d | 10u-4d  |
| 04          | Bit error rate minor                                     | 10u-6d to 10u-4d | 10u-4d  |
| 05          | Errored seconds                                          | 00001 to 65535   | 864     |
| 06          | Severe errored seconds                                   | 001 to 255       | 225     |
| 07          | Change of frame alignment, major                         | 001 to 511       | 511     |
| 08          | Change of frame alignment, minor                         | 001 to 255       | 17      |
| 09          | Shelf alarm, near end                                    | 00000 to 65535   | 00000   |
| 10          | Shelf alarm, far end                                     | 00000 to 65535   | 00000   |
| *           | Setting the SLIP threshold to zero suppresses the alarm. |                  |         |

4. Enter **ED-PRMTR-EQPT : : [DGP-ppp] : : \**  
**{RT|DL}-ffff,g[g] : [{sss|NDL|RTF}] ;** to correlate protection line NPC(s) with other NPCs going to RT. If the data link was not enabled when digroup A was added, the DLT command must be entered (see *Delete Digroup Designations*) for DGA followed by the ED (add) command for DGA and DATA Link in DGA.

Where:

- RT|DL = Selects either RT for remote terminal or DL for DCLU as the type of connecting equipment.
- ffff = RT or DCLU identifier.
- g = Mode: 1 for SLC 96 carrier Mode I;  
 3 for SLC 96 carrier Mode III;  
 1 for SLC Series 5 carrier FPB;  
 C for SLC Series 5 carrier FPC.
- aaa,bbb,ccc,ddd = NPC numbers to be assigned to digroups; A, B, C, and D.
- ppp = NPC number to be assigned to protection facility if provided.

- RT|DL = Selects either RT for remote terminal or DL for DCLU as the type of connecting equipment.
- sss = For *SLC* 96 carrier digroup A to specify power or miscellaneous alarm as follows: PMN (power-minor alarm, default if single RT is used at the site) or PMJ (power-major alarm) or MMJ or MMN for major or minor miscellaneous alarm.
- NDL = Optional, for *SLC* 96 carrier to disable use of data link with digroup A.
- RTF = Optional, for *SLC* Series 5 carrier digroup A to assign retrofit status to the system which prevents the DACS II from overwriting (clearing) the RT channel provisioning. The RTF status must be changed after the channel provisioning is loaded into the DACS II to allow DACS II auditing.
5. Enter **RTRV-PRMTR-EQPT::NPC-<npc No.>:SCDG;** for the protection line NPC to see the NPCs associated with the other RT digroups.
  6. At DSX-1 bay, make cross-connections between line jacks and DACS II NPC jacks.
  7. Enter **RST-EQPT::<npc No.>[&&[&]-<range>];;** to restore the NPC(s).

**NOTE:**

The restore operation causes diagnostics to be run on the NPCs and changes the status to in-service.

**NOTE:**

When the NPCs for DGP of *SLC* 96 carrier Mode I are restored, the DACS II automatically duplicates the cross-connection of the locally-switched channels between the RT and DCLU for DGA.

8. Have tester at RT remove looping card at LIU P TSTS jack and watch the ACU MN alarm indications. This ACU MN alarm should occur and then clear approximately 15 seconds after the next step is completed.
9. At DSX-1 bay, remove line feed signal and termination on line side jacks and remove any looping cords from DACS II side jacks.
10. If you want to check the status of the facility, enter  
**RTRV-STATE-EQPT::NPC-<npc No.>;.**

Where: <npc No.> = The NPC for the protection line.

11. Enter **SW-TOPROTN-T1::NPC-<npc No>::[INCL];** at DACS II to verify data link communications and protection switching.

Where: INCL = Optional, needed to switch DGA.

12. If protection switching of any digroups B, C, or D is to be denied, enter **INH-SW-T1:: {NPC-<npc No.>|DGx}:: [{RT|DL}-ffff];** using one of the identifiers (NPC, RT, or DL) for the digroups.
-

---

**When to Use**

Use this procedure to convert a SLC 96 carrier Mode I, 5:5 protection configuration to a 5:4 protection configuration. There is no protection line from the DACS II and the DCLU; the only protection line will be between the DACS II and the RT. The 5:5 protection provided for earlier generics (protection was provided between the RT, DACS II and the DCLU) is replaced by the SLC 96 carrier Mode I, 5:4 pass-through protection. With a 5:4 configuration, the Mode I can have up to 5 DS1 lines (4 service and 1 optional protection) on the RT interface and up to 4 service DS1 lines on the DCLU interface.

---

**Before you Begin**

Note the following:

- To ensure no service outage occurs, it is recommended that all failures on primary (for example, A, B, C, D) be cleared and the digroups restored so that all digroups P of Mode I can be freed from protecting any primary.
- This procedure is a 2-step process where all 5:5 protection systems must be manually converted to 4:4 systems prior to the 5:4 retrofit (this must be done before the generic upgrade).

---

**Related Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to convert a SLC 96 carrier Mode I, 5:5 protection configuration to a 5:4 protection configuration.

1. What conversion do you want to perform?
  - If CONVERT 5:5 to 5:4, go to Step 2.
  - If CONVERT 4:4 to 5:4, go to Step 7.
2. If DGP is in service to the DCLU, enter **RMV-EQPT::NPC-<npc No.>**; to remove the NPC from service.

Where: <npc No.> = NPC number, either extended (for example, 0001) or hierarchical (for example, 01-1-01).
3. If DGP is in service to the RT, enter **RMV-EQPT::NPC-<npc No.>**; to remove the NPC from service.

Where: <npc No.> = NPC number for DGP going to the RT.
4. Enter **DLT-PRMTR-EQPT::DGP-ppp::DL-ffff**; to delete the DGP for the DCLU.
5. Enter **DLT-PRMTR-EQPT::DGP-ppp::RT-ffff**; to delete the DGP for the RT.
6. Enter **DISC-EQPT:NPC-<npc No.>**;

Where: <npc No.> = NPC for DGP going to the DCLU.
7. Enter **ED-PRMTR-EQPT::DGP-ppp::RT-ffff,g[g]**;

**NOTE:**

The mate of the RT DGP is now reserved and registered to carry M-field message exchange between DCLU and the RT through the DACS II. The reservation will be done automatically by the software when the ADD command of RT DGP is issued.

8. Enter **RST-EQPT::NPC-<npc No.>**; to restore the DGP to the RT.

Where: <npc No.> = NPC number for DGP going to the RT.
  9. Reload the old software release and perform the entire retrofit procedure again.
-



---

## Delete Digroup Designation

# 3.44

---

### When to Use

Use this procedure to remove the correlation from the DACS II data base in order to make a change; the NPC must be out-of-service to use the DLT command.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to remove the NPC from service and delete the digroup designations from the DACS II database.

1. Enter **RMV-EQPT::NPC-<npc No.>::[:INCL];** to remove NPCs that are to be deleted.

Where:

<npc No.> = NPC number either extended (for example, 0001) or hierarchical (for example, 01-1-01) .

INCL = Optional, needed to remove an NPC with special circuits.



**NOTE:**

INCL is required to remove DGA because DGA carries the communications data link.

2. If all four NPCs going to the RT or DCLU are to be reassigned, you can enter those NPCs at one time in the DGA through DGD fields of the DLT command; otherwise, only use the involved digroup fields.



**NOTE:**

For *SLC* Series 5 carrier, digroup pairs (A and B) and (C and D) must be deleted together in command(s) because they are associated in the RT controller.

3. Enter the DLT command as follows:  
**DLT-PRMTR-EQPT::[DGA-aaa,  
DGB-bbb,DGC-ccc,DGD-ddd,DGP-ppp]::{:RT|DL}-ffff;.**

Where:

RT|DL = Selects either RT for remote terminal or DL for DCLU as the type of connecting equipment.

ffff = RT or DL identifier.

aaa-ddd, ppp = NPC numbers to be assigned to digroups.

4. Check the output message to verify correct entry of information.
-

---

**When to Use**

Use this procedure to change the far-end bank identifier.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

---

## Instructions

---

Use this procedure to change the far-end bank identifier.

1. Enter **ED-PRMTR-EQPT:::{RT|DL}-ffff:{RL|DL}-hhhh;**

Where:

- ffff = Bank identification number which is to be changed.
- hhhh = New bank identification number. For Series 5 carrier, different RT IDs must be assigned to banks on the same RT shelf to avoid problems in the RT data base.

2. Check the output message to verify that correct information was entered.
-

---

## Change State of the *SLC*® Series 5 RT Bank

# 3.46

---

### When to Use

Use this procedure to change the status of the SLC Series 5 RT bank from retrofit to nonretrofit.

---

### Related Information

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to change the status of the SLC Series 5 RT bank from retrofit to nonretrofit.

1. Enter **ED-PRMTR-EQPT:::RT-ffff:RTF** to change the status of the SLC Series 5 RT bank from retrofit to nonretrofit.

Where: ffff = RT bank identification number.

2. Check the output message to verify that correct information was entered.
-

---

**Change Power/Miscellaneous  
Alarm Designation**

# 3.47

---

**When to Use**                      Use this command to change the power/miscellaneous alarm for SLC 96 carrier.

---

**Related  
Information**                      For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to change the power/miscellaneous alarm for SLC 96 carrier.

1. Consider the following concerning the power/miscellaneous alarm option which only applies to *SLC 96* carrier:
  - The power or miscellaneous alarm is carried over the data link on DGA; so, the NDL (no data link) must not have been used when the ED (add digroup) DGA command was entered.
  - The miscellaneous alarm indicates an open door, flooding, fire, or gas at the RT site. This alarm can be used for the second RT bank at the site; the power alarm is used for the first RT bank.
2. Enter **ED-PRMTR-EQPT:::RT-ffff:sss;** to change the power/miscellaneous alarm for *SLC 96* carrier.

Where:

ffff = Bank identification number of connecting RT for which the alarm meaning is to be changed.

sss = Required new meaning given by one of the following: PMN for power minor alarm (default and required for one RT at site), PMJ for power major alarm, MMJ for miscellaneous major alarm, or MMN for miscellaneous minor alarm.

3. Check the output message to verify that correct information was entered.
-



---

## **Operate *SLC*® Carrier System Protection Switch or Line Loopback**

# **3.48**

---

### **When to Use**

Switching to the protection line occurs automatically if one of the primary lines fails and can be initiated by entry of commands at the DACS II. For *SLC* 96 Mode III and *SLC* Series 5 carrier, protection switching is done at the DACS II and the RT. There is no protection line between DACS II and the DCLU; the protection switching occurs at the DACS II and the RT. The switching is accomplished at the DACS II by automatic cross-connections between the primary and protection line channels. Line loopbacks can be produced on command at the DACS II or connecting RT to allow trouble isolation. To prevent interruption of service, the loopbacks can only be operated if: (1) there are no cross-connections on the digroup, (2) protection switching is operated for the digroup, or (3) the digroup is already failed and protection switching is not available.

---

### **Related Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to operate SLC carrier system protection switch or line loopback/

1. Which activity do you need to accomplish?
  - If **Operate/Change Protection Switching Only**, then do Step 2.
  - If **Initiate Loopback**, then do Steps 2 and 3.
  - If **Change Loopback State**, then go to Step 3.
2. Enter appropriate command to change switch state as required:  
**SW-TOPROTN-T1:: {NPC-<npc No.>|DGx}:**  
**: [{RL|DL}-ffff]: [INCL];**  
  
**SW-TOWKG-T1:: {NPC-<npc No.>|DGx}:**  
**: [{RL|DL}-ffff]: [INCL];**  
**{ALW|INH|SW-T1}:: {NPC-<npc No.>|DGx}:**  
**: [{RL|DL}-ffff]: [INCL];**. If COMPLD message is received, proceed to Step 4.
  - If the command is denied, find reason for denial in the output message and perform corrective action to obtain command completion.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- TOWKG = Inhibits automatic switch protection.
- ffff = RT identifier or DL identifier (for SLC 96 Carrier System).
- DG\_ = Selects the digroup for loopback. The DCLU does not have a DGP.
- ALW = To allow automatic switching on digroup.
- INH = To inhibit automatic switching on digroup. Keywords INCL and FRC may also be required in the command.
- FRC = Required to inhibit (INH) failed digroup from switching (when switch becomes available). Also required with INCL to inhibit (INH) protection of DGA in SLC Series 5 carrier.
- INCL = Required to effect protection switching on digroup A (DGA).

3. Enter appropriate command to perform desired loopback function:

```
{OPR|RLS}-LPBK-T1:: {DGA|DGB|DGC|DGD|DGP}::  
LLB:{RT|DL}-ffff;  
{INH|ALW}-LPBK-T1:: {DGA|DGB|DGC|DGD|DGP}::  
LLB:{TO|FROM}:{RT|DL}-ffff;.
```

Where:

- ffff = RT identification or DCLU identification if DL is selected for loopback toward DCLU for SLC 96 Mode I.
- DG\_ = Selects the digroup for loopback. The DCLU does not have a DGP.
- TO/FROM = Requests loopback to be sent (TO - sends request to RT; FROM - sent from RT) either toward the far end (TO, default) or from far end (FROM).
- RLS = To terminate existing loopback. Not valid with FROM keyword.



**NOTE:**

If initiating loopback in DGA, manually switch DGA to protection.

4. Enter **RTRV-PRMTR-EQPT:: [NPC-<npc No.>]::SCDG:STATE: [{RT-ffff|DL-ffff|ALL}]**; with the required identifier or for all RTs. The output is in the form of a grid with the digroups on the horizontal axis and the PLSW (protection line switch), LLB (line loopback), and ALST (alarm) along the vertical axis. Read the PLSW or LLB status.
5. Read the ALST column as follows: the status component is either MN (minor) or MJ (major) and the location is NE (near end), FE (far end), or CL (carrier line).
6. Use original command with appropriate keyword to return switch or loopback to normal (USW or NORM keyword) after testing is completed.



---

**When to Use**

Use this procedure to establish a DS3 facility.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

**Task**

Complete the following steps to review the frame and link configuration:

| Step | Action                                                                         | Reference                |
|------|--------------------------------------------------------------------------------|--------------------------|
| 1    | Check far-end installation, make DSX-3 connections, and check DS3 line status. | SE 3.49.1    page 3.49-3 |
| 2    | Test DS3U and HDS3U protection switching.                                      | SE 3.49.2    page 3.49-4 |
| 3    | Check far-end corss-connection, loop DS1 signals, and check DS1 status.        | SE 3.49.3    page 3.49-6 |

---

---

### **SE 3.49.1: Check Far-End Installation, Make DSX-3 Connections, Check DS3 Line Status**

---

1. Verify that far-end DS3 equipment has been equipped and tested and that the DS3 line has also been established and tested.
2. At the DSX-3 bay, make wiring cross-connections over to DACS II.
3. Enter **RTRV-STATE-T3::UNIT-[q]q:DS3-c[&&-d]**; to check DS3 line status for unit and DS3 number (or range) in unit.
4. Remove any looping cards at the DSX-3 bay and verify that DS3 line alarms clear (ALM IDLD messages received).

**NOTE:**

The DS3 MMFGs should already be restored to service as per *Install circuit packs, Grow and Restore DS3U*.

---

## SE 3.49.2: Test DS3U and HDS3U Protection Switching

1. Enter command to initiate the MMFG protection switch as follows: **SW-  
TOPROTN-EQPT : :UNIT- [q]q :MMFG-c [ :FRC] ;**

Where:

|      |   |                                                                                             |
|------|---|---------------------------------------------------------------------------------------------|
| [q]q | = | Unit number (1 through 16).                                                                 |
| c    | = | MMFG number (1 through 6) to be switched                                                    |
| FRC  | = | Optional, to force switch even if protection connected to another service must be released. |



**NOTE:**

The switch can also be initiated by pulling a service MXR/EMXR/HMXR pack or entering the MMFG remove command as follows: **RMV-EQPT : :UNIT- [q]q :MMFG-c ;**.

2. Notice the SW ...COMPLD message and verify that ALM message is not received on line which has been switched onto protection.
3. Enter **RTRV-STATE-EQPT : :UNIT- [q]q :PROTN;** to see the overall protection state for the unit.
4. Observe the following in the query output message:
  - The message is divided into the top half for the FLI status and the bottom half for the MMFG status.
  - In the FLI portion, the maintenance status and then the protection are listed for both the service and protection FLIs.
  - In the MMFG portion, there are 7 MMFG groupings; the leftmost is for the protection MMFG and the others are for MMFGs 1 through 6. Each grouping consists of the following:
    - The first item is the MXR/HMXR maintenance status.
    - (If DS3U only) The second item is the EMIU maintenance status.
    - The next item is the protection status.
    - The last item details the availability of switching (if MMFG switching was requested).
5. Interpret the maintenance and protection status keywords. All the possible codes are consolidated in the table; not all the codes apply to each DS3/HDS3 circuit pack.
6. Enter **RTRV-STATE-T3 : :UNIT- [q]q :DS3-c;** for same unit and MMFG (c = MMFG No.) to obtain PSTATE summary.



7. Enter command for manual switchback as follows:  
**SW-TOWKG-EQPT: :UNIT-[q]q: :MMFG-c;** for the MMFG that was switched.

**NOTE:**

If switch was initiated by pulling a pack or removing the MMFG, do the reverse operation (install, restore) here to cause switchback.

8. If you want to compare the status to the switched status, enter **RTRV-STATE-EQPT: :UNIT-[q]q: :PROTN;** and read status as before.
  9. If you want to test the FLI switching, enter **SW-TOPROTN-EQPT: :UNIT-[q]q: :FLI;** and after the completion, enter **RTRV-STATE-EQPT: :UNIT-[q]q: :PROTN;** to read the status as before.
  10. Enter **SW-TOWKG-EQPT: :UNIT-[q]q: :FLI;** to switch back the FLI.
-

---

### **SE 3.49.3: Check Far-End Cross-Connection, Loop DS1 Signals, and Check DS1 Status**

---

1. If far-end equipment for component DS1 facilities has been tested and is ready for connection, have far-end tester make wiring cross-connections at DSX-1.
  2. If far-end equipment for component DS1 facilities is not ready for connection, have far-end tester connect looping cords at muldem jacks of DSX-1.
  3. If you want to use the DACS II to check the status of the component DS1, enter **RTRV-STATE-EQPT::NPC-<npc No.>**; for the NPC.
-

---

**When to Use**

This command connects a channel or a range of channels in a digroup to the subrate feature. Parity channels may also be established.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to connect a channel or a range of channels in a digroup to the subrate feature.

1. Familiarize yourself with the following commands.

For DS0A:

**CRTE-CRS-TS::<npc No.>-ddd[&&-eee]::DS0A-rr:SEC;**

**CRTE-CRS-TS::<npc No.>-ddd[&&-eee]::DS0A-rr**

For DS0B:

**CRTE-CRS-TS::<npc No.>-ddd[&&-eee]::DS0B-nn**

**CRTE-CRS-TS::<npc No.>-ddd[&&-eee]::DS0B-nn:PCH[-ppp];**

For 56kb/s:

**CRTE-CRS-TS::<npc No.>-ddd::DS0A-56:PCH[-ppp];**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). The additional NPCs on the DS3 are identified by suffix, A through H.
- ddd = First channel number within the digroup.
- eee = Last numbered channel in a range of channels. The eee is eliminated in a single command and is not allowed when a parity channel is associated with a channel being addressed by the command (the command will be denied).
- rr = Channel rate (24, 48, 96 = 2.4, 4.8, 9.6 kb/s, respectively).
- nn = Number of DS0B subrate customer channels (5, 10, or 20).
- ppp = Parity channel number.  
If the parity number (ppp) is not specified, the parity channel is assigned as ddd + 1.

2. Enter the appropriate command with the required information.



**NOTE:**

If the command is denied with the first line ending with **{INERR|SYNTAX} 2LN MSG**, the input command had an error in it, and the two equal signs (=) in the denial message show where the problem occurred. Reenter the command.

3. Check completion message to verify changes.

4. To familiarize yourself with the query that shows subrate established channels, enter  
**RTRV-STATE-TS::<npc No.>-ddd[&&-eee]  
[&&[&]-<range>-jjj[&&-kkk]]:;**
-



---

**When to Use**

Use this procedure to move a subrate established channel and all associated subrate cross-connections from an existing digroup and channel to a new digroup and channel.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

Use this procedure to

1. Familiarize yourself with the following command:

```
ED-CRTE-TS: :<npc no.1>-ddd[&&-eee],  
<npc no.2>-jjj[-kkk]:[:PCH-ppp][:DCC];
```

Where:

- <npc No.1> = OLD NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). The additional NPCs on the DS3 are identified by suffix, A through H.
- ddd,jjj = First channel in a continuous range.
- eee,kkk = Last channel in a range. The eee, or kkk is eliminated in a single channel command and is not allowed when a parity channel is associated with a channel being addressed by the command.
- <npc No.2> = NEW NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). The additional NPCs on the DS3 are identified by suffix, A through H.
- ppp = Indicates the number of the parity channel to be associated with the new data channel.

2. Enter the appropriate command with the required information.



**NOTE:**

If the command is denied with the first line ending with **{INERR|SYNTAX} 2LN MSG**, the input command had an error in it, and the two equal signs (=) in the denial message show where the problem occurred. Go to Step 1 and reenter the command.

3. Check completion message to verify changes.
4. To familiarize yourself with the query that shows substrate established channels, enter **RTRV-STATE-TS: :<npc No.>-ddd[&&-eee] [ &&[&] -<range>-jjj[&&-kkk]] : ; .**



---

**When to Use**

Use this procedure to disestablish a channel or a range of channels associated with a group from use by the subrate feature. Associated parity channels are also disestablished.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

Use this procedure to disestablish one or a range of subrate channels.

1. Enter **DLT-CRS-TS::<npc No.>-ddd[&&[&]-eee]:**  
**[ :PCH[-ppp]][ :DCC];**

Where:

- <npc No.> = NPC number, either extended (for example, 0001) or hierarchical (for example, 01-1-01).
- ddd = Channel number within the digroup for a single channel of the number of the lowest numbered channel in a range of channels.
- eee = Last channel in a range of channels, not allowed when a parity channel is associated with a channel being addressed by the command.
- PCH = Indicates parity channel associated with channel being addressed. Downward compatibility with the equivalent DACS II/subrate command. The command will disestablish the parity channel (associated with ddd channel) with or without PCH included in the command.
- ppp = Number of the parity channel. For downward compatibility only, the command will perform the same with or without ppp.
- DCC = Causes the DCC UMC control code to be inserted in the disestablished channel(s) toward the digroup facility.

2. Enter the appropriate command with the required information.
3. Check completion message to verify changes.



**NOTE:**

If the command is denied with the first line ending with **{INERR|SYNTAX} 2LN MSG**, the input command had an error in it, and the two equal signs (= =) in the denial message show where the problem occurred. Reenter the command.

---

**When to Use**

Use this procedure to check the link connections, initialize characteristics of the link, and select input command priority, link language, NPC addressing, and output message screening options.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 3, *Provisioning*.

---

## Instructions

---

### Task

| Step | Action                                                                                      | Reference                                   |
|------|---------------------------------------------------------------------------------------------|---------------------------------------------|
| 1    | Check link connections.                                                                     | SE 3.53.1 page 3.53-3                       |
| 2    | Initialize, set type and rate characteristics.                                              | SE 3.53.2 page 3.53-5                       |
| 3    | Change input command priority, link language, NPC addressing, and output message screening. | Volume II, Chapter 6, GT 6.5 through GT 6.8 |

---

### **SE 3.53.1: Check Link Connections**

Use this procedure to check link connections.

1. 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.
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), or for connecting to a SCAT. To establish communication between the SCAT and the DACS II Administration Link, do the following:
    1. Provision one of the DACS II synchronous administration links for Modified Synder Protocol and restore the link into service.
    2. Load the SCAT software into the PC and configure the software to direct the interface through the PC's serial interface.
    3. Connect a standard RS-232 cable to the PC's serial port.
    4. Connect the opposite end of the RS-232 cable to a DACS II ED2C646-30 G2 (25 pin to 37 pin) adaptor.
    5. Connect the G2 adaptor to the selected DACS II administration link.
  - 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).
  - Use a G9 adapter for a link to CIU (craft interface unit) for *SLC* Series 5 carrier. This is for an asynchronous link.



**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. Links that are in service but not in use are autonomously removed and restored with SOFT ERR hardware messages. The TCP/IP link (link 7) must be manually removed from service.

To avoid the SOFT ERR hardware message, links that are not in use should be manually removed from service.

---

## SE 3.53.2: Initialize, Set Type and Rate Characteristics

Use this procedure to prepare DACS II links for connections. There are seven links available for connection of terminal equipment and operations systems. With the ICI (TM782), links 5 and 6 are synchronous links using X.25 protocol (through level 3) at rates up to 56 kb/s. Link 7 is a TCP/IP link using telnet protocol.

Up to 16 virtual circuits or 16 sessions can be established on each synchronous link or TCP/IP link. The characteristics of each link can be changed from the defaults provided by DACS II using the ED PRMTR LINK commands.

1. What type of link is being established?
  - If **ASYNCHRONOUS**, continue with Step 2.
  - If **TABS**, proceed to Step 3.
  - If **SYNCHRONOUS**, proceed to Step 4.
  - If **TCP/IP**, proceed to Step 5.
2. Enter the appropriate command to initialize link or make changes:

```
ED-PRMTR-LINK::j::PTCOL-S[,BAUD-bb] \
[,ALM-k][,BS-e][,ENQ-q][,XON x][:INIT]; or
ED-PRMTR-LINK::j::PTCOL-M[,ALM-k][:INIT];.
```

Where:

- j = Physical link number (1 through 7).
- 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).

- j = Physical link number (1 through 7).
- ENQ-q = To enable/disable ENQ/ACK acknowledgment protocol to match terminal requirement; q = 0 to disable or q = 1 to 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. [See Note.]
- INIT = Optional, to initialize all parameters to default values except for those parameters entered in command.

**NOTE:**

If the output on a Snider link provisioned with the XON feature is suppressed by a DTE sending an XOFF character, the link is periodically removed from service by the error recovery.

3. Enter the following commands to make required settings:

```
ED-PRMTR-LINK: :j: :PTCOL-T, BAUD-bb; \
ED-PRMTR-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).

4. To initialize the link or change alarm class, enter

```
ED-PRMTR-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.



5. To initialize the link or change alarm class, enter  
**ED-PRMTR-LINK::j::PTCOL-I[,ALM-k][:INIT];**

Where:

j = Physical link number (5 or 6).  
 PTCOL I = TCP/IP 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.

6. Enter **RTRV-PRMTR-LINK::j[mm]:;** to see the existing (or default) link parameter values. The link must be removed from service to change parameters. If using the TCP/IP link, proceed to Step 9.

7. To enter different **data layer** values, list the subject parameter followed by the value (for example, K-5). Enter the command as follows:

**ED-PRMTR-LINK::j::[K-b][,T1-eee][,T3-ggg]\  
 [,N2-aa][,FRMAD-{A|B}];**

Where:

j = Physical link number (5 or 6).  
 FRMAD {A|B} = Frame address in X.25 layer; default is A.

8. 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:

**ED-PRMTR-LINK::j[mm]::\  
 [<param>-<value>,...<param>-<value>]\  
 [,VC-ppss&-gghh][,DBIT v];**

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 for which different values are to be specified; identified by designation (for example, T20).  
 <value> = Value of named parameter.  
 ppss = Number of virtual circuits (01 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.  
 v = X.25 d-bit setting (0 or 1); 0 is default.  
 0 = off (unset) (acknowledgement done from local DTE).  
 1 = on (set) (acknowledgement done from remote DTE).

9. If DENY message with explanation that link is out-of-service is received, enter **RST-EQPT: :LINK-j ;** and reenter ED LINK command. Enter **RMV-EQPT: :LINK-j ;** if link is in-service.

Where: j = Link number.

If using the TCP/IP link, proceed to Step **11**.

10. 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 ENQ/ACK protocol is used) and same baud rate as the link. Complete terminal specifications are found in the information notes of SD-96658-01.
  11. If you are restoring the link to service, enter **RST-EQPT: :LINK-j [mm] ;**.
-

---

## Establish IP Address for the ICI Circuit Pack

# 3.54

---

### When to Use

Use this procedure to set up the Internet Protocol (IP) address of the ICI circuit pack.

---

### Related Information

For related information, see:

- Volume I, Chapter 1, *Introduction*
  - Volume I, Chapter 3, *Provisioning*
  - GT 3.55
-

## Instructions

---

**Task**

Enter the command below to set up the IP address for the ICI circuit pack:

**SET-IP-ADDR:::x.x.x.x;SET-IP-ADDR:::{x.x.x.x:{IP|GATEWAY|IPMASK}|TCPDB};**

Where:

INIT = Initialize.

IP = Internet Address.

GATEWAY = Gateway Identifier.

IPMASK = Subnetwork Mask.

x = The valid value is from 0 through 255.

TCPDB = Retrieve the network information from the data base.

**NOTE:**

After the successful implementation of SET ADDR, the user should enter the command prior to initiating a hard reset. Any address modifications become operative only after a frame reset.

**CPY-MEM:::WKG, MEM;**

---

---

## Establish Telnet Session to the TCP/IP Link on the ICI Circuit Pack

# 3.55

---

### When to Use

Use this General Task to establish a telnet session on the TCP/IP administrative link (Link 7). You must establish a telnet session in order to use Link 7.

---

### Related Information

For related information, see:

- Volume I, Chapter 1, *Introduction*
  - Volume I, Chapter 3, *Provisioning*
  - GT 3.54
-

## Instructions

Use the following procedure to establish a telnet session on the TCP/IP administrative link.

1. Enter the following command to find out the IP address:

**RTRV-NET-ADDR[, RAM|DB]:::;**

Where:

NET-ADDR = Displays the IP and Ethernet addresses that will be active after a reboot.

RAM = Displays the IP address that is currently active for the TCP/IP link.

DB = Displays the IP and Ethernet addresses in the database. These addresses will be active after a reboot.

Output example:

**INTERNET ADDR - 135.185.169.89**

**INTERNET MASK - 255.255.248.0**

**GATEWAY ADDR - 135.185.175.254**

**ETHERNET ADDR - 00:60:1D:05:00:45**

2. Enter the **ADD::USER** command to add a new user.

Example:

**ADD::USER GREEN, NEW;**

3. At the **PASSWD:** prompt, enter a password. At the **REENTER PASSWD** prompt, enter the password again.

When you have successfully added a new user, a completion message appears.

Output example:

**M 09:15:15 30,00 1 ADD USER GREEN NEW COMPL**

4. From a different window or different terminal, telnet into link 7 using the INTERNET ADDR output in Step 1:

Example:

**GR >telnet 135.185.169.89**

Output example:

**Trying 135.185.169.89...**

**Connected to 135.185.169.89.**

**Escape character is '^]'.**

**WARNING! THIS IS A RESTRICTED SYSTEM!**

5. At the 'Login:' prompt, log in as the user created in Step 2 and enter the password. Enter the Login and Password in UPPER CASE.

Output example:

**Login: GREEN**

**Password:**

**DO NOT PROCEED UNLESS YOU ARE AUTHORIZED!**

6. At the 'dacs2>' prompt, type **link**.

Output example:

**dacs2> link**

**WARNING MESSAGE**

**THIS SYSTEM IS RESTRICTED TO AT&T AUTHORIZED USERS**

**FOR BUSINESS PURPOSES. UNAUTHORIZED ACCESS IS A**

**VIOLATION OF THE LAW. THIS SERVICE MAY BE MONITORED FOR  
ADMINISTRATIVE AND SECURITY REASONS. BY PROCEEDING, YOU  
CONSENT TO THIS MONITORING.**

7. Enter normal DACS commands.
-





---

|                                                                        |           |
|------------------------------------------------------------------------|-----------|
| ■ Make DSX-1 Cross-Connections                                         | GT 4.1-1  |
| ■ Install Plug-Ins, Grow and Restore NPC to Function as NPCTP or NPCTG | GT 4.2-1  |
| ■ DS0 Circuits: Connect Hubbed Testport(s) to Local DACS II            | GT 4.3-1  |
| ■ DS0 Circuits: Looping Back a Test Port                               | GT 4.4-1  |
| ■ DS0 Circuits: Connect Testport in Monitor Mode and Split Circuit     | GT 4.5-1  |
| ■ DS0 Circuits: Change Circuit Termination State (TLA/TLR)             | GT 4.6-1  |
| ■ DS0 Circuits: Release Test Port                                      | GT 4.7-1  |
| ■ Clear-DS1 Signals: Establish/Change Clear-DS1 Test Access            | GT 4.8-1  |
| ■ Clear-DS1 Signals: Change Non-channelized Circuit Termination State  | GT 4.9-1  |
| ■ Clear-DS1 Signals: Establish Clear-DS1 Hub Connection                | GT 4.10-1 |
| ■ Clear-DS1 Signals: Establish Loopback on Facility Access Digroup     | GT 4.11-1 |
| ■ Clear-DS1 Signals: Release Test Access                               | GT 4.12-1 |

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|                                                                             |           |
|-----------------------------------------------------------------------------|-----------|
| ■ Subrate DS0A or DS0B Circuits: Access Two-Point Circuit in Monitor Mode   | GT 4.13-1 |
| ■ Subrate DS0A or DS0B Circuits: Access Multipoint Circuit in Monitor Mode  | GT 4.14-1 |
| ■ Subrate DS0A or DS0B Circuits: Access Multipoint Circuit in Split Mode    | GT 4.15-1 |
| ■ Subrate DS0A or DS0B Circuits: Change Access to Split Mode                | GT 4.16-1 |
| ■ Subrate DS0A or DS0B Circuits: Change Terminate and Leave Test Access     | GT 4.17-1 |
| ■ Subrate DS0A or DS0B Circuits: Release Subrate Specific Test Port Channel | GT 4.18-1 |
| ■ Subrate DS0A or DS0B Circuits: Release Groups of Subrate Testports        | GT 4.19-1 |
| ■ Disestablish a Test Port External to a DSP Application                    | GT 4.20-1 |
| ■ Nx64 Kbit/s: Connect Test Group in Monitor Mode and Split Circuit         | GT 4.21-1 |
| ■ Nx64 Kbit/s: Change Circuit Termination State                             | GT 4.22-1 |
| ■ Nx64 Kbit/s: Connect Test Group in HUB Mode                               | GT 4.23-1 |
| ■ Nx64 Kbit/s: Connect Test Group in LOOPED Mode                            | GT 4.24-1 |
| ■ Nx64 Kbit/s: Release and Degrow Test Group                                | GT 4.25-1 |
| ■ Integrated Test Set: Initiate/Stop Test Signal Generation                 | GT 4.26-1 |
| ■ Integrated Test Set: Insert Bit Error                                     | GT 4.27-1 |
| ■ Integrated Test Set: Start/Stop Test Signal Monitoring                    | GT 4.28-1 |
| ■ Integrated Test Set: Query Error Performance Parameters                   | GT 4.29-1 |

---

---

**When to Use**

Use this procedure to check cross-connection equipment and make DSX-1 cross-connections.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to check cross-connection equipment and make DSX-1 cross-connections.

1. Verify that connecting equipment (D4 bank or digital test) has been tested.
  2. Use office records to determine the DACS II and DSX-1 jack appearances to be cross-connected.
  3. Insert dummy plugs (258 plugs or 800-series DSX cord plugs) in the MON jacks of the two sets of jacks to be cross-connected. This should light the TL lamps and help locate the position from behind the bay.
  4. If the TL lamp for each jack set does not light, check for 48 volts with VOM across the TL lamp which is not lighted.
    - If 48 volts is present, replace the TL lamp.
    - If 48 volts is not present, clear trouble in wiring between fuse at top of DSX-bay and TL lamp.
  5. Review the following guidelines for running cross-connections: Leave at least 8 inches of slack on short runs. Dress wires through fanout at bottom of panel. Run wires in horizontal or vertical troughs (top and bottom troughs for interbay) and remember the 85-foot limit.
  6. With the BACK PANEL X-CONN FIELD DSX-bay, make cross-connections between subject jack sets using Y1-type wire.
  7. With the FRONT PANEL (800-SERIES) DSX-bay, make wire-wrap connections between jack sets using five conductors of the cross-connect wire.
  8. Remove one of the dummy plugs.
    - If both TL lamps remain lighted, remove other dummy plug.  
**Response:** Both lights will go off.
    - If both TL lamps remain unlighted, make corrections to wiring using reference drawings.
  9. Record relay rack or other jack set identification on DSX-panel designation strip.
-

---

## **Install Plug-Ins, Grow and Restore NPC to Function as NPCTP or NPCTG**

# 4.2

---

### **When to Use**

Use this set of procedures to do the following:

- Install plug-ins
- Grow and restore NPC to function as an NPC test port (NPCTP)
- Grow and restore NPC to function as an NPC test group (NPCTG)

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

### Tasks

Complete the following steps install plug-ins, grow and restore an NPC test port or grow and restore an NPC test group.

| Step | Action                              | Reference           |
|------|-------------------------------------|---------------------|
| 1    | Install plug-ins.                   | SE 4.2.1 page 4.2-3 |
| 2    | Designate NPC as an NPC test port.  | SE 4.2.2 page 4.2-4 |
| 3    | Grow test ports.                    | SE 4.2.3 page 4.2-5 |
| 4    | Designate NPC as an NPC test group. | SE 4.2.4 page 4.2-6 |
| 5    | Grow test groups.                   | SE 4.2.5 page 4.2-7 |

---

## SE 4.2.1: Install Plug-Ins

### Procedure

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: DS1 line and channel formats, facility alarm thresholds, and the channel insertion word. The DS1 line formats are given by the TYPE specification; TYPE DE100 is the default. If used, alarm threshold options must already be defined in the data base.

1. Install TG80 or TG80B dual digroup card for two testport NPCs.
2. Before you enter the command, familiarize yourself with command as follows:

**CRTE-EQPT::NPC-<npc No.>[&&[&]-<range>]::[DExyz][:rr/  
l&ss/m,&tt/n,...)];**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, last NPC of continuous range of NPCs. Three ampersand (&s) are required for hierarchical.
- xyz = Line and channel format specification; DE100 (default).
- rr/l...tt/n = Optional, to list any one or all alarm types and predefined number (0 through 3) which sets alarm threshold.

3. Enter command with required information.

EXAMPLE: **CRTE-EQPT::NPC-012::DE100:01/1&03/2&07/2;**

4. Check output message to verify type and option selections.

Enter **RST-EQPT::NPC-<npc No.>[&&[&]-<range>]::** Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <range> = Optional, to name the final NPC when it is desired to restore a continuous range of FTU-NPCs. Three ampersand (&s) are required for hierarchical.

## **SE 4.2.2: Designate NPC as NPCTP**

---

### **Procedure**

1. Enter : **CRTE-EQPT::NPC-<npc No.>::NPCTP-n;**  
Where: n = 1 through 8.
  2. Notice the associated TPs that can now be grown.
-



---

## SE 4.2.3: Grow Test Ports

---

### Procedure

This procedure is used to grow test ports on a TAD (test access digroup). These TADs are given a NPCTP designation in the data base by the entry of a CRTE NPCTP GRTH NPCTP command. Up to eight NPCs can be so designated on the frame, providing up to 96 test ports, 12 on each TAD. 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 **CRTE-EQPT::TP-kk[:<tc>];**

Where:

- kk = Test port number (01 through 96) on test access digroup.
- tc = Optional, used for Static Trunk Conditioning.

## **SE 4.2.4: Designate NPC as NPCTG**

---

### **Procedure**

1. Enter : **CRTE-EQPT::NPC-<npc No.>::NPCTG-rrr;**  
Where: rrr = 1 through 400.
-

---

## SE 4.2.5: Grow Test Groups

---

### Procedure

This procedure is used to grow test groups (TGs) on a TAD (test access digroup). These TADs are given a NPCTG designation in the data base by the entry of a CRTE NPCTG command. 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 24. The bundles, called east and west, can be on separate NPCs or on the same NPC, if bandwidth permits. 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 24 channels, for DS1. The two ranges may belong to two NPCTGs, or the same NPCTG but not overlapping.
2. Enter **CRTE-EQPT::TG-mmm::\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.    |

---



---

## **DS0 Circuits: Connect Hubbed Testport(s) to Local DACS II**

# 4.3

---

### **When to Use**

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.

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure to connect 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

**CONN-HUB-T0::<npc No.>-jjj::kk:<tc>;**

Where:

<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, 01-1-01).

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.

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 CGA field indicate no such failure.
3. To release a test port-to-test port connection, enter:

**DISC-TACC-T0:::kk[:OOS];**

Where:

OOS = Optional, to allow releasing connection when any of the involved NPCs are out-of-service.

---

**When to Use**

Use this procedure 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.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to loop back the two channels of a specified Test Port.

To loop back a DSO Test Port, enter the following command:

**OPR-LPBK-T0:::kk[:<tc>]**

Where:

- 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.

---



---

## DS0 Circuits: Connect Testport in Monitor Mode and Split Circuit

# 4.5

---

### When to Use

This procedure gives the command and considerations for establishing test access to a 64 Kbit/s channel. This initial access is a bridged connection to allow monitoring the circuit for service before it is split for testing. In a DS1 2.048-Mb/s Interface gateway environment, either a DS1 NPC or a type PB/PC NPC can be used as the test access NPC. In either case, the test access NPC performs the necessary signal conversions to allow testing either side of the Gateway circuit. To test signaling with a type PB/PC NPC, the test access NPC must be provisioned for CAS (odd-numbered x value in growth specification). Generally, DACS II test access adopts the characteristics of the accessed circuit, but, for unmapped terminations, there is a trunk conditioning option and a NAM option (for Gateway) in the command.

---

### Related Information

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

1. Enter **RTRV** 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:

**CONN-TACC-T0::<npc No.2>-jjj::kkk:[<tc>][,NAM]:MON;**

Where:

<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 CONN-CRS1 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  $\mu$ -law signal conversion at test access NPC. Needed to test digital data circuits (where there is no encoding) at unmapped terminations.

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 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.
4. Enter the command with the required information. For 1-way circuits, the TO side entered in the CONN-CRS1 must be entered here.
  - If the CONN ...COMPLD message is not received, find the reason for denial in the output message and perform corrective action to obtain command completion.
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 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).
  - RDLD indicates red, special service circuit.
  - CUS indicates customer control of channel.
  - ONEWAY indicates one-way circuit accessed.
6. To split the circuit for transmission or signaling tests, enter:

**CHG-TACC-T0:::kk:SPLT;**

At this point, you can run tests from the local test panel or test position.

---



---

**DS0 Circuits: Change Circuit  
Termination State (TLA/TLR)**

# 4.6

---

**When to Use**

Use this procedure to change the circuit termination state.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure to change the circuit termination state.

1. Enter the command listed under TERMINATION STATE 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.



**NOTE:**

The termination state or TLP (transmission level point) of a conference bridge circuit cannot be changed using the command in Figure 4.6-1 if the T or F side was previously designated as NTR (no transmit) in TLA command.

2. Enter the command listed under CONFERENCE BRIDGE PARAMETERS in Figure 4.6-1 to enter given parameters.



**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 RDLD/CUS word will occur if special service circuits were changed.

**TERMINATION STATE:**

ED-PRMTR-T0:[xy]:<npc No.1>-ddd[&&-eee],<npc No.2>-jjj[&&-kkk]:[ww]:[INCL]:{TERM|RLS}{F/T/B/L/G/A}[:NOT-<npc No.3>-vvv];

CHG-TL-T0:[xy]:[ww]:kk:TERM{F/T/B/L/G/A}[:NOT-<npc No.3>-vvv];

**CONFERENCE BRIDGE PARAMETERS**

ED-PRMTR-T0:[xy]:<npc No.1>-ddd,<npc No.2>-jjj:[ww]:[INCL]:[TLP-snn-smm,NG-nn,ES-ee];

**EXPLANATION OF VARIABLES**

- <npc No.1> = NPC number on FROM side, extended (for example, 001) or hierarchical (for example, 01-1-01). Refer to **DLP-569** for NPC numbering information.
- <npc No.2> = NPC number on TO side. See <npc No.1>.
- ddd/-jj = Channel number on NPC.
- eee/-kk = Optional, last channel of range.
- TERM|RLS = Desired state, (TERM) terminated or 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.3>-vvv" below.
- NOT-<npc No.3>-vvv = One leg specified that is NOT to be changed with all others.
- kk = Testport number (01-96).
- INCL = Optional, needed if channel in command is red special service circuit or a CUS circuit.
- TLP-snn-smm = Signal level adjustment, "snn" is the input level and "smm" is output level; s = sign (+ or -). Range for nn is -9.0 to +8.8 in 0.2 db steps (entered as whole Nos. -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 4.6-1. Change Commands**





---

**When to Use**

Use this procedure to release the test port.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## **Instructions**

---

Use this procedure to release a test port.

1. When testing is completed, release test access by entering, **DISC-TACC-T0:::kk;**.
-

---

## Clear-DS1 Signals: Establish/Change Clear-DS1 Test Access

# 4.8

---

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to establish or change a test access mode for a clear-DS1 signal. |
|--------------------|--------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

## Instructions

Use this procedure to establish or change a test access mode for a clear-DS1 signal.

1. Familiarize yourself with the different test access modes described in Volume I, Chapter 4. See *Establish Loopback on Facility Access Digroup* for loopback.
2. To establish connection, enter the command as follows with the appropriate connection mode:

**CONN-TACC-T1::<npc No.1>[&<npc No.2>],<npc No.3>\  
[,<npc No.4>] ::<tmode>[:AIS][:INCL];**

Where:

<tmode> = Test mode.

<npc No.1> = NPC number of FAD; NPC of pair for MONEF, SPLTAB, or SPLTEF. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

<npc No.2> = Optional, second NPC number of FAD pair.

<npc No.3> = Reference NPC, E-end NPC or backbone of BDCST.

<npc No.4> = Optional, to name different F-end NPC of broadcast circuit; if omitted, existing F-end or full tributary will supply.

AIS = Optional, to select AIS termination signal sent on disconnected side of split circuit; not valid for unmapped termination. QRSS may be a future offering.

INCL = Optional, to test special service or customer controlled circuit. Required for all modes, except monitor modes.

3. To change the test access mode, modes MONEF, SPLTEF, and SPLTAB each require two FADs and can only be changed from one to the other.

**CHG-ACCMD-T1::<npc No.1>[,<npc No.2>::\  
<tmode>[:AIS][:INCL];**

Where:

<npc No.> = NPC number of FAD.

<tmode> = Test mode.

4. To familiarize yourself with the connection query, enter the following using the FAD for the <npc No.>.

**RTRV-PRMTR-T1::<npc No.>:T0;**

5. To familiarize yourself with all current test ports (TADs and FADs), enter the following: **RTRV-TACC-T1::;**
-



---

**Clear-DS1 Signals: Change  
Non-channelized Circuit Termination  
State**

# 4.9

---

**When to Use**                      Use this procedure to change the termination state of a non-channelized circuit.

---

**Related  
Information**                      For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

Use this procedure to change the termination state of a non-channelized circuit.

1. Familiarize yourself with the termination and termination signal selections in Table 4.9-1.

**Table 4.9-1. Terminations and Signals**

| Termination | Meaning                                               |
|-------------|-------------------------------------------------------|
| NORM        | Normal data of the cross-connection.                  |
| TERM        | Terminate side with default termination signal (AIS). |

2. Consider the following restrictions on making changes:
  - E-end mode cannot be changed for test session in any of the following modes: SPLTF, SPLTEF, or LOOPF.
  - F-end mode cannot be changed for test session in any of the following modes: SPLTE, SPLTEF, or LOOPE.
  - E-end mode cannot be changed on a 1-way circuit under test.
3. Enter following command with the appropriate fields and modes to make the required changes:

**CHG-TACC-T1::<npc No.1>[,<npc No.1B>]::\n  
{[:<emode> y][,<fmode y>]}[:INCL];**

Where:

<npc No.1> = NPC number for FAD; with bidirectional access, two NPCs can be entered. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

<emode> y = Optional, to select termination mode (y) for E-end NPC.

<fmode> y = Optional, to select termination mode (y) for F-end NPC.

INCL = Optional. Used to make changes to special service or customer controlled circuit.



---

## Clear-DS1 Signals: Establish Clear-DS1 Hub Connection

# 4.10

---

|                    |                                                                              |
|--------------------|------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to establish a hub connection for a clear-DS1 connection. |
|--------------------|------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

---

## Instructions

---

Use this procedure to establish a clear-DS1 hub connection.

1. Enter the following command to establish the hub connection:

**CONN-HUB-T1::<npc No.1>,<npc No.2>[:INCL];**

Where:

<npc No.1> = NPC number of facility access digroup, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

<npc No.2> = NPC number of TO-side NPC connected to remote FAD.

INCL = Optional. Used if one or more of the NPCs is marked as special service or customer controlled circuit.

---

---

**Clear-DS1 Signals: Establish  
Loopback on Facility Access  
Digroup**

# 4.11

---

**When to Use**

Use this procedure to establish a loopback connection on a facility access digroup.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure to establish a loopback connection on a facility access digroup.

1. Enter the following command:

**OPR-LPBK-T1::<npc No.>::LPBKT[:INCL];**

Where:

<npc No.> = NPC number of subject facility access digroup, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

INCL = Optional. Used if one or more of the NPCs is marked as special service or customer controlled circuit.



**NOTE:**

While looped, the termination signal is looped to the facility access digroup.

---

---

## Clear-DS1 Signals: Release Test Access

# 4.12

---

### When to Use

Use this procedure to release test access.

---

### Related Information

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to release test access.

1. If you want to see the test access connection and characteristics of the FAD, enter **RTRV-PRMTR-T0::<npc No.>:T0;**  
Where: <npc No.> = NPC number of facility access digroup.
  2. At this point, you can run tests using the external test set connected to the facility access digroup.
  3. When testing is completed, enter the following message to release test access: **DISC-TACC-T1:: [<fad No.>]:[:00S];**
-

---

**Subrate DS0A or DS0B Circuits:  
Access Two-Point Circuit in Monitor  
Mode**

# 4.13

---

**When to Use**

Use this procedure to change a specified test port channel to the monitor mode for a subrate circuit (data transmission in the tested circuit is not interrupted). Although primarily for 2-point circuits, it can be used to access the facility ends of a multipoint circuit (on MJU).

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure to change a specified test port channel to the monitor mode for a substrate circuit.

1. Enter the following command:

```
CONN-TACC-TS::<npc No.>-ddd[-ff]::kk:  
MON: MJU-ssss:[BRi];
```

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

ddd = TO channel number within the digroup.

ff = TO customer number.

kk = Test port channel number (01 through 96).



**NOTE:**

The external facility termination is connected to the TO test port channel. The external facility termination can be part of a two-point circuit, the master leg, or the branch termination of a multipoint circuit.

---



---

**Substrate DS0A or DS0B Circuits:  
Access Multipoint Circuit in Monitor  
Mode**

# 4.14

---

|                    |                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to access a substrate multipoint circuit in the monitor mode with a test port (data transmission in the tested circuit is not interrupted). |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

---

## Instructions

---

Use this procedure to access a subrate multipoint circuit in the monitor mode with a test port (data transmission in the tested circuit is not interrupted).

1. Which part of the circuit do you need to access?
  - If branch of MJU, continue with Step 2.
  - If control leg of MJU, proceed to Step 3.

2. For test access to a branch of an MJU, enter:

**CONN-TACC-TS::<npc No.>-ddd[-ff]::kk:MON;\  
MJU-ssss:BRi;.**

The TO test port channel faces MJU ssss; the FROM test port channel faces the external facility termination for the specified branch or control leg port of the MJU cascaded from the specified branch (i) of MJU ssss.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- ddd = channel number within the TO-side digroup.
- ff = TO-side customer number.
- kk = Test port channel number (01 through 96).
- ssss = MJU identification number addressed by this command (1 through 9999).
- i = Branch number of MJU ssss (1 through 4).

3. For test access to a control leg of an MJU, enter

**CONN-TACC-TS::<npc No.>-ddd[-ff]::kk:  
MON:MJU-ssss;.**

The TO test port channel faces the MJU; the FROM test port channel faces the external facility termination for MJU 1 or toward the branch from which MJU ssss is cascaded if MJU ssss is greater than 1.

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
  - ddd = TO channel number within the digroup.
  - ff = TO customer number. Optional when channel is a DS0A.
  - kk = Test port channel number (01 through 96).
  - ssss = MJU identification number addressed by this command (1 through 9999).
-

---

**Substrate DS0A or DS0B Circuits:  
Access Multipoint Circuit in Split  
Mode**

# 4.15

---

**When to Use**

Use this procedure to access a substrate multipoint circuit directly in the split testing mode with a test port; the circuit cannot be in the test port monitor mode. Data transmission in the tested circuit is not interrupted.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure to access a subrate multipoint circuit directly in the split testing mode with a test port.

1. Which part of circuit do you need to access?
  - If control leg of MJU, continue with Step 2.
  - If branch of MJU, proceed to Step 3.

2. For test access to a CONTROL LEG, enter

**CONN-TACC-TS:<npc No.>ddd[-ff]::kk:  
SPLT:MJU-ssss;**

The TO test port channel faces the MJU; the FROM test port channel faces the external facility termination for MJU 1 or toward the branch from which MJU ssss is cascaded if MJU ssss is greater than 1.

Where:

<npc No.> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).  
ddd = TO channel number within the digroup.  
ff = TO customer number.  
kk = Test port channel number (01 through 96).  
ssss = MJU identification number addressed by this command (1 through 9999).

3. For test access to a BRANCH, enter

**CONN-TACC-TS:<npc No.>-ddd[-ff]::kk:  
SPLT:MJU-ssss:[BRi];**

The TO test port channel faces MJU ssss; the FROM test port channel faces the external facility termination for the specified branch or control leg port of the MJU cascaded from the specified branch (i) of MJU ssss.

Where:

<npc No.> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).  
ddd = TO channel number within the digroup.  
ff = TO customer number.  
kk = Test port channel number (01 through 96).  
ssss = MJU identification number addressed by this command (1 through 9999).  
i = Branch number of MJU ssss (1 through 4).

---

---

**Subrate DS0A or DS0B Circuits:  
Change Access to Split Mode**

# 4.16

---

|                    |                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to change a specified test port channel on a subrate circuit to the split mode. |
|--------------------|----------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | Split test access to an entire multiplexed DS0B channel (rather than a single DS0B customer) can only be done by first monitoring the channel and then splitting it by use of this command without a digroup and channel number. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

---

## Instructions

---

Use this procedure to change a specified test port channel on a subrate circuit to the split mode.

1. Enter the following command:

**CONN-TACC-TS::<npv No.>ddd[-ff]::kk:SPLT;**

Where:

<npc No.> = TO NPC number, either extended (for example, [0]001)  
or hierarchical (for example, 01-1-01).

ddd = TO channel number within the digroup.

ff = TO customer number.

kk = Test port channel number (01 through 96).

---

---

**Substrate DS0A or DS0B Circuits:  
Change Terminate and Leave Test  
Access**

# 4.17

---

**When to Use**

Use this procedure to change terminate and leave test access.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to change terminate and leave test access.

1. To change the terminate and leave state of the substrate circuit under test on the specified test port channel, enter

**CHG-TL-TS:::kk:TERM{F|T|B};**



**NOTE:**

The TO side is defined as the side of the circuit connected to the even numbered test port channel, and the FROM side is connected to the odd numbered test port channel.

Where:

kk = Test port channel number (01 through 96).

F,T,B = From, to, or both (F, T, or B).

---



---

**Subrate DS0A or DS0B Circuits:  
Release Subrate Specific Test Port  
Channel**

# 4.18

---

|                    |                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to release a subrate circuit from test access on a specified test port channel and to restore the circuit to normal. |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                       |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | If the circuit was terminated either before or during test access, it will retain the termination state upon release. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

## **Instructions**

---

Use this procedure to release a subrate circuit from test access on a specified test port channel and to restore the circuit to normal.

1. Enter **CONN-TACC-TS:::kk;**

Where:

kk = Test port channel number (01 through 96).

---

---

**Subrate DS0A or DS0B Circuits:  
Release Groups of Subrate Testports**

# 4.19

---

**When to Use**

Use this procedure to release all test port channels connected to the subrate circuits that were initiated by this administrative link ("ALL" keyword) or all test port channels connected to subrate channels regardless of which administrative link initiated the test access ("LINK" keyword).

---

**Related  
Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## **Instructions**

---

Use this procedure to release all test port channels connected to the subrate circuits that were initiated by this administrative link ("ALL" keyword) or all test port channels connected to subrate channels regardless of which administrative link initiated the test access ("LINK" keyword).

1. Enter:  
**CONN-TACC-TS::::{ALL|LINKS};**
-

---

## Disestablish a Test Port External to a DSP Application

# 4.20

---

### When to Use

Use this procedure to disestablish a test port external to an application.

---

### Related Information

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to disestablish a test port external to an application.

1. Enter the following command to find the channel pair used by the application for the test port:

**RTRV-CRS-T1::<npc No. 1>[&&<npc No. 2>]::MAP;**

Where:

MAP = Cross-connect Map.

<npc No.1> = The NPC number or the first number in a range, either extended (for example, [0]001) or hierarchical (for example, 01101).

2. Enter the following command to release the test access connection and restore the circuit under test to its mapped (terminated or normal) state:

**DISC-TACC-T0:::kk:[00S]:FRC;**

Where:

kk = Test port number (01 through 96).

OOS = Out-of-Service; used to release test ports on an out-of-service circuit.

FRC = Force the disconnect.

3. Enter the following command to disconnect the test port connection:

**DISC-DSP-T0::<npc No. 1>-ddd[&&-eee],<npc No. 2>-jjj[&&-kkk]:;**

Where:

<npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers.

eee, kkk = Channel numbers, denoting the end of a range:

**001-024** - DE, DA, TE, and TA NPC types

**000-031** - PA, PB, PC, and TH NPC types

**001-064** - SD NPC types (except numbers divisible by 4).

---

---

## **Nx64 Kbit/s: Connect Test Group in Monitor Mode and Split Circuit**

# 4.21

---

### **When to Use**

Use this procedure to establish 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.

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

Use this procedure to establish test access to a range of 64 Kbit/s channels.

1. Enter **RTRV-TACC-T0::TG-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 **RTRV-TACC-T0::NPCTG-rrr[&&-sss];** to query an NPCTG or a range of NPCTGs.

2. Familiarize yourself with the monitor command as follows:

```
CONN-TACC-T0::<npc No.>-jjj[&&-kkk]\  
[&-lll&...]:TG-mmm:[<tc>]:MON;
```

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 CONN-CRS1 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.
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 CONN-CRS1 must be entered here.
    - If the CONN ...COMPLD message is not received, find the reason for denial in the output message and perform corrective action to obtain command completion.



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).
  - RDLD 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:

**CHG-TACC-T0:::TG-mmm:SPLT;**



**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.

At this point, you can run tests from the local test panel or test position.

7. To change the mode of a TG currently in split mode to monitor mode, enter  
**CHG-TACC-T0:::TG-mmm:MON;**



---

## Nx64 Kbit/s: Change Circuit Termination State

# 4.22

---

|                    |                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to to modify the terminate and leave active (TERM) and terminate and leave released (RLS) states of one or both ends of a Nx64 Kbit/s cross-connection associated with a TG. |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                                                                                    |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | 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. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

## Instructions

---

.Use the following procedure to change the circuit termination state.

1. To modify the terminate and leave active states, enter:

**CHG-TL-T0:::TG-mmm:TERM{F|T|B}**

Where:

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:

**DISC-TACC-T0:::TG-mmm:RLS{F|T|B}**

Where:

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.

---

---

## **Nx64 Kbit/s: Connect Test Group in HUB Mode**

# 4.23

---

### **When to Use**

Use this procedure 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.

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

---

## Instructions

---

Use this procedure to set up an Nx64 Kbit/s HUB test access connection via a test group.

1. Enter **CONN-HUB-T0::uv-m-np-ddd,wx-k-qr-jjj::\  
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.

---

---

## **Nx64 Kbit/s: Connect Test Group in LOOPED Mode**

# 4.24

---

### **When to Use**

Use this 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.

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this loopback test access command to place both bundles of a test-access group (TG) in the looped mode.

1. To loop back a bundles of a TG, enter the following command:

**OPR-LPBK-T0::mmm[:<tc>]**

Where:

- 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.
-



---

## **Nx64 Kbit/s: Release and Degrow Test Group**

# 4.25

---

### **When to Use**

Use this procedure 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.

---

### **Related Information**

For related information, refer to Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Use this procedure 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:

**DISC-TACC-T0 : : : 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:

**DISC-EQPT : : TG-mmm[&&-nnn] : ;**

If the range mmm-nnn includes some undesigned TG numbers, these numbers will be skipped. The output message will indicate degrown and skipped TGs appropriately.

3. To degrow an NPCTG, enter:

**DISC-EQPT : : NPC-uv-m-np : : NPCTG-rr [ : 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).

---

---

## Integrated Test Set: Initiate/Stop Test Signal Generation

# 4.26

---

|                    |                                                                                                                                                                  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to turn on or turn off test signal generation on one bundle of a test access group (TG) currently in split, looped, or hub test access modes. |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                          |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | Before you begin this task, a test group must be grown using NPC test groups that are provisioned as ITS (ST-type) NPCs. |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, see Volume I, Chapter 4, <i>Test Access</i> . |
|----------------------------|------------------------------------------------------------------------|

---

## Instructions

---

Enter the command below to initiate or stop test signal generation:

```
CHG-TACC-T0:::TG-mmm:\  
TSG-{ON|OFF}[:<pattern>:{EAST|WEST}[SIG-abcd]];
```

Where:

- TG = Test-access group.
  - mmm = Test-access group number (001 through 400).  
(The test-access group is designated as in command I.31421.)
  - TSG = Test Signal Generation.
  - ON = Initiate test signal generation.
  - OFF = Stop test signal generation.
  - <pattern> = Test pattern to be transmitted. Test patterns supported:
    - PATT X'ef  
8 bit user-defined pattern (in hexadecimal notation)
    - 511PRBS  
511 bit pseudo-random bit sequence
    - 2047PRBS  
2047 bit pseudo-random bit sequence.
  - EAST = Generated signal to be transmitted on East bundle of TG.
  - WEST = Generated signal to be transmitted on West bundle of TG.
  - abcd = 4 bit signaling word to be transmitted with pattern. If not specified, the signaling word defaults to 0101.
-

---

**When to Use**                      Use this procedure to insert a bit error into the generated test signal.

---

**Before You Begin**              Before you begin this task, the TG used for the ITS must be:

- Grown using NPC test groups that are provisioned as ITS (ST-type) NPCs.
- In test signal generation mode.

---

**Related Information**            For related information, see Volume I, Chapter 4, *Test Access*.

---

## Instructions

---

Enter the command below to insert bit error in the test signal:

**CHG-TACC-T0:::TG-mmm:INS;**

Where:

- TG = Test-access group.
  - mmm = Test-access group number (001 through 400). (The test-access group is designated as in command I.31421.)
  - INS = Insert a bit error into the generated test signal.
-

---

## Integrated Test Set: Start/Stop Test Signal Monitoring

# 4.28

---

|                            |                                                                                                                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to turn on or turn off test signal monitoring on one bundle of a test access group (TG) currently in test signal generation mode. Only one TG bundle per TG193B circuit pack can be in test signal monitor mode at a time. |
| <b>Before You Begin</b>    | <p>Before you begin this task, a test group must be grown using NPC test groups that are provisioned as ITS (ST-type) NPCs.</p> <p>The ITS must have test signal generation turned on.</p>                                                    |
| <b>Related Information</b> | <p>For related information, see Volume I, Chapter 4, <i>Test Access</i>.</p>                                                                                                                                                                  |

## Instructions

---

Enter the command below to start or stop test signal monitoring:

**CHG-TACC-T0 : : : TG-mmm:TSM-{ON|OFF}[:{EAST|WEST}[:TINT-nnn]];**

Where:

- TG = Test-access group.
  - mmm = Test-access group number (001 through 400).  
(The test-access group is designated as in command I.31421.)
  - TSM = Test Signal Monitor.
  - ON = Initiate test signal monitoring.
  - OFF = Stop test signal monitoring.
  - EAST = Monitor the signal received on East bundle of TG.
  - WEST = Monitor the signal received on West bundle of TG.
  - TINT = Test interval.
  - nnn = Duration of test in minutes (acceptable range 1-120). If not specified, the test interval is open-ended.
-



---

## Integrated Test Set: Query Error Performance Parameters

# 4.29

---

|                            |                                                                                                                                                                                   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to query the status of the Integrated Test Set (ITS) and to retrieve the error performance parameter results from a test signal monitoring session of the ITS. |
| <b>Before You Begin</b>    | Before you begin this task, a test group must be grown using NPC test groups that are provisioned as ITS (ST-type) NPCs.                                                          |
| <b>Related Information</b> | For related information, see Volume I, Chapter 4, <i>Test Access</i> .                                                                                                            |

---

## **Instructions**

---

Enter the command below to retrieve the BERT error performance parameters:

**RTRV-TACC-T0::TG-mmm::TSM;**

Where:

TSM = Test Signal Monitor.

TG = Test-access group.

mmm = Test-access group number (001 through 400).  
(The test-access group is designated as in  
command I.31421.)

---

---

|                                                                             |           |
|-----------------------------------------------------------------------------|-----------|
| ■ DS0 Signals: Two-point, Two-way or One-way Circuits                       | GT 5.1-1  |
| ■ DS0 Signals: Two-point Gateway Circuits                                   | GT 5.2-1  |
| ■ DS0 Signals: Two-point Multi-point Circuits                               | GT 5.3-1  |
| ■ DS0 Signals: Broadcast Circuits                                           | GT 5.4-1  |
| ■ DS0 Signals: One-Way Multipoint Circuit                                   | GT 5.5-1  |
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| ■ DS0 Signals: Disconnect Cross-Connected Circuit                           | GT 5.7-1  |
| ■ DS0 Signals: Move Facility End Points                                     | GT 5.8-1  |
| ■ Clear-DS1 Signals: Cross-Connect Two-Point, Two-Way or One-Way Circuit    | GT 5.9-1  |
| ■ Clear-DS1 Signals: Cross-Connect Broadcast Circuit                        | GT 5.10-1 |
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| ■ TS0: Change TS0                                                           | GT 5.14-1 |
| ■ TS0: Disconnect TS0 Circuit                                               | GT 5.15-1 |
| ■ TS0: Disconnect Broadcast Circuit                                         | GT 5.16-1 |

---

(Continued on next page)

|                                                                                       |           |
|---------------------------------------------------------------------------------------|-----------|
| ■ Subrate: Cross-Connect Two-Point, Circuit                                           | GT 5.17-1 |
| ■ Subrate: Connect Multipoint Circuit (with DSPU)                                     | GT 5.18-5 |
| ■ Subrate: Connect 19.2-kb/s Multipoint Circuit<br>(with External MJU Shelf)          | GT 5.19-1 |
| ■ Subrate: Change Two-Point Terminate and Leave State                                 | GT 5.20-1 |
| ■ Subrate: Change Multipoint Terminate and Leave State                                | GT 5.21-1 |
| ■ Subrate: Change Multipoint Master                                                   | GT 5.22-1 |
| ■ Subrate: Disconnect Two-Point Circuit                                               | GT 5.23-1 |
| ■ Subrate: Disconnect Multipoint Bridge                                               | GT 5.24-1 |
| ■ Subrate: Disconnect Multipoint Master                                               | GT 5.25-1 |
| ■ Re-Direct DS0 Signals                                                               | GT 5.26-1 |
| ■ Re-Direct DS1 Signals: Network Element                                              | GT 5.27-1 |
| ■ Re-Direct DS1 Signals: Non-Network Element                                          | GT 5.28-1 |
| ■ DSP Application: Cross-Connect, Change or Disconnect<br>DSP Application Connections | GT 5.29-1 |
| ■ DSP Platform: Application-to-Application Cross-Connections                          | GT 5.30-1 |

---

---

## DS0 Signals: Two-point, Two-way or One-way Circuits

# 5.1

---

### When to Use

Use this procedure to cross-connect, change, or disconnect DS0 signals, including *SLC*<sup>®</sup> Carrier. This procedure covers two-point two-way circuits and two-point one-way circuits.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

1. Familiarize yourself with the commands; the CRS is for a 2-way connection and the CRS1 is for a 1-way connection. The T0 (T zero) keyword indicates a DSO circuit. The <npc No.1> and <npc No.2> side assignments serve as reference for the CRS1 connection and for test access.

Two-Way:

```
CONN-CRS-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\  
[&&-kkk]::<tc>:[RDLD][,{CUS|INCL}]:[AIS]:\  
[{:NORM,NORM|TERM,TERM}]:[PRIOUT];
```

One-Way:

```
CONN-CRS1-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\  
[&&-kkk]::<tc>:[RDLD][,{CUS|INCL}]\  
[:{:NORM|TERM}]:[PRIOUT];
```

2. Obtain information needed for command from circuit layout information. Four dashes must be entered for the FROM-side in the TC field of a one-way command.
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.

Where:

CRS, CRS1 = CRS for 2-way; CRS1 for 1-way.

<npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001)) or hierarchical (for example, 01-1-01).

<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 or 01 through 96 for SLC Carrier NPCs.

eee = Optional; last channel of range to be connected.

<npc No.2> = NPC number of other side (TO); see <npc No.1>.

jjj = Channel number (01 through 24).

kkk = Optional; last channel of range to be connected.

<tc> = Trunk conditioning per circuit layout card.

RDLD = Optional; to designate red special service circuit.

CUS = Optional; to designate customer controlled channels.

INCL = Optional; to remove previous CUS channel designation.

- AIS = Optional; for 24-channel range connection to supply all 1s signal downstream when incoming CGA is received.
- NORM|TERM = To specify unterminated, normal (NORM, default) or terminated (TERM), preservice connection.
- PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

4. Familiarize yourself with connection query outputs:

- Enter **RTRV-PRMTR-T0::<npc No.2>-jjj[&&-kkk]::T0;** to obtain the other end of a connection and to see trunk conditioning for DGA and *SLC* carrier channel numbers.

Where:

- <npc No.> = NPC number of termination; for *SLC* Carrier System, use NPC for DGA.
- jjj = Channel number of circuit; for *SLC* carrier channel, use *SLC* carrier channel number on DGA.
- kkk = Optional, last channel of a range of channels on DGA.

- For all connections on NPC, enter

**RTRV-CRS-T1::<npc No.>[&&[&]-<npc No.2>]::MAP;**

Where: <npc No.> = NPC number; for *SLC* Carrier System, actual RT digroup number (not DGA virtual).

- For all NPCs associated with RT "ffff", enter  
**RTRV-CRS-T1:::[ffff]:{RTMAP/DLMAP};.**



**NOTE:**

For *SLC* 96 carrier, the digroup and channel for the QRY TO (or QRY FROM) in Step 4 can be either digroup A and the virtual channel or actual RT digroup and *SLC* carrier channel number.



**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.

5. For 1-way circuits, you can query the connection (if any) in the other direction of the same NPC by entering **RTRV-PRMTR-T0::<npc No.1>-ddd::FROM; .**





---

## DS0 Signals: Two-point Gateway Circuits

# 5.2

---

### When to Use

Use this procedure to create 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.

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

## Instructions

Use this procedure to create 1-way or 2-way cross-connections between channels of PBCs (primary block circuits).

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:

```
CONN-CRS-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\
[&&-kkk]::<tc>[, SC-abcd,abcd][,NAM]:[RDLD]\
[, {CUS|INCL}]:[AIS]:[NORM,NORM|TERM,TERM]:[PRIOUT];
```

One-Way:

```
CONN-CRS1-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\
[&&-kk]::<tc>[, SC-----,abcd][,NAM]:[RDLD]\
[, {CUS|INCL}]:[NORM|TERM]:[PRIOUT];
```

2. Enter the appropriate command for type of circuit required:

Two-Way:

```
CONN-CRS-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\
[&&-kkk]::<tc>[, SC-abcd,abcd][,NAM]:[RDLD]\
[, {CUS|INCL}]:[AIS]:[NORM,NORM|TERM,TERM]:[PRIOUT];
```

One-Way:

```
CONN-CRS1-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\
[&&-kk]::<tc>[, SC-----,abcd][,NAM]:[RDLD]\
[, {CUS|INCL}]:[NORM|TERM]:[PRIOUT];
```

Where:

- <npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001) or hierarchical (for example, 01-1-01). (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).                                                                                                      |
| 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 $\mu$ -law encoding conversions.                                             |
| RDLD          | = | Optional, designates special service.                                                                                                                                   |
| CUS           | = | Optional, customer controlled circuit.                                                                                                                                  |
| INCL          | = | To remove previous CUS channel designation.                                                                                                                             |
| AIS           | = | <b>Only for pure DS1 24-channel</b> connection to supply all 1s downstream when incoming CGA or AIS is received.                                                        |
| NORM TERM     | = | To specify unterminated, normal connection (default) or terminated, preservice connection.                                                                              |
| PRIOUT        | = | Optional; to give priority to associated output message by placing it on the top of the output message queue.                                                           |

### 3. Familiarize yourself with connection query outputs:

- To obtain the other end of a connection and to see trunk conditioning, enter:

**RTRV-PRMTR-T0::<npc No.>-jjj[&&-kkk]::T0;**

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:

**RTRV-CRS-T1::<npc No.>[-<range>]::MAP;**

Where:

<npc No.> = NPC number of one side of the connection.

<range> = NPC number of last NPC in the range.

- For 1-way circuits, you can query the connection (if any) in the other direction of the same NPC by entering

**RTRV-PRMTR-T0::<npc No.1>-ddd::FROM;**

- For cross-connect information between individual DSP application cards, enter:

**RTRV-CRS-APPL:::{<npc No.>|ALL};**

Use the **ALL** keyword to retrieve information on this type of cross-connection for the entire frame.

---

---

**DS0 Signals:**  
**Two-point Multi-point Circuits**

# 5.3

---

|                    |                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | This section covers both symmetrical and broadcast multipoint configurations that are set up using the DSPU (DMB-type) NPC or virtual NPC. |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------|
| <b>Related Information</b> | For additional information, see Volume I, Chapter 5, <i>Cross-Connections and Disconnections</i> . |
|----------------------------|----------------------------------------------------------------------------------------------------|

---

## Instructions

This section covers both symmetrical and broadcast multipoint configurations that are set up using the DSPU (DMB-type) NPC or virtual NPCs.

1. Study the following command and obtain needed information:

```
CONN-CRS-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\  
[&&-kkk]::<tc>[,NAM]:[RDLD][,{CUS|INCL}]:fmd,tmd\  
[:NTR-m][:{NORM,NORM|TERM,TERM}]:[PRIOUT];
```

Where:

- CRS = CRS is for 2-way,
- <npc No.1> = NPC number for FROM side.  
For SLC carrier leg, always specify digroup A NPC and channel digroup A NPC and channel.
- ddd/jjj = Conference number if bridging end or channel number if facility leg end.
- eee/kkk = Optional, last channel of continuous range to be connected.
- <npc No.2> = NPC number for TO side; see <npc No. 1>.
- <tc> = The same trunk conditioning does not have to be entered for each leg/tributary, but each must contain TRSP word.  
TRSP,IW-X-*nn*[*n*]. If omitted, the default of TRSP,IW-X-FF applies.
- NAM = No A-law to  $\mu$ -law.  
The A-law to  $\mu$ -law and  $\mu$ -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  $\mu$ -law and  $\mu$ -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  $\mu$ -law and  $\mu$ -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.

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.

RDLD = Optional, designates red special service (RDLD).

CUS = Optional, designates customer control (CUS).

INCL = Optional, removes previous channel CUS designation.

NORM|TERM = To specify normal, unterminated connection (default) or terminated, preservice connection.

PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.



**NOTE:**

TERM,TERM can be used in commands to establish preservice terminated state.

2. Enter cross-connect command for a segment of the multipoint circuit.



**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.

3. 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.
4. To see all the conference legs, enter  
**RTRV-PRMTR-T0::<npc No.>-ddd::T0;**

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.

---



---

**When to Use**

This section presents the BDCST 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 with ampersands (&). 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 RPATH command.

---

**Related Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

The Broadcast TS0 information can be found in GT 5.13.

---

## Instructions

1. Familiarize yourself with the commands as follows:

Multiple tributaries (up to 8):

**CONN-BDCST-T0::<npc No.1>-ddd&&[-eee],<npc No.2>-jjj\  
[&<npc No.3>-nnn][&<npc No.4>-ppp]::<tc>[,NAM][,<sc>]:**

Single Tributary:

**CONN-BDCST-T0::<npc No.1>-ddd&&[-eee],<npc No.2>-jjj\  
::<tc>[,NAM][,<sc>]:[RDLD][,{CUS|INCL}]\  
[:{NTR|LPD|CONV}];**

Where:

- <npc No.1> = Broadcast NPC number, either extended (for example [0]001) or hierarchical (for example, 01-1-01).
- ddd-eee = Range of channels to be broadcast (for example, 01 through 24). eee is optional.
- TOX = Up to 8 tributaries can be connected to the broadcast leg at one time.
- jjj/nnn/ppp = 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  $\mu$ -law.  
The A-law to  $\mu$ -law and  $\mu$ -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  $\mu$ -law and  $\mu$ -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  $\mu$ -law and  $\mu$ -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 BDCST.

RDLD = 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.

**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.



---

## DS0 Signals: One-Way Multipoint Circuit

# 5.5

---

### When to Use

This section describes a method for establishing one-way broadcast circuits using the CRS1 MPM command and virtual NPC [9]961 through [9]966 (or 99-1-01 through 99-1-06). To build this circuit, 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.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to establish a one-way broadcast circuit.

1. Study the following command and obtain needed information.

```
CONN-CRS1-T0::<npc No.1>-ddd[&&-eee],<npc No.2>-jjj\  
[&&-kkk]:<tc>[,NAM]:[RDLD][,{CUS|INCL}]:fmd,tmd\  
[:{NORM|TERM}]:[PRIOUT];
```

Where:

- <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 if facility leg end. The channel numbers run from 01 through 24 for DS1 NPCs and for *SLC* carrier leg, specify digroup A NPC and channel. See Table 5.5-1.
- 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> = Trunk conditioning. If entered, does not have to be same for each leg, but TRSP,IW-X-nn form must be used.
- NAM = No A-law to  $\mu$ -law.  
The A-law to  $\mu$ -law and  $\mu$ -law to A-law code translators on the E1 type NPC are disabled.
- RDLD = Optional, designates special service.
- CUS = Optional, designates customer control circuit.
- INCL = Optional, removes previous CUS channel designation.
- NORM|TERM = Selects either normal (NORM), unterminated (default) connections or preservice, terminated (TERM) connections.
- PRIOUT = Optional; to give priority to associated output message by placing it on the top of the output message queue.

**Table 5.5-1. Channel Numbers**

| Type NPC                             | Channels                             |
|--------------------------------------|--------------------------------------|
| DE                                   | 01-24                                |
| SLC <sup>®</sup> 96 carrier Mode I   | 01-24                                |
| & SLC <sup>®</sup> Series 5 carrier  | 25-48 (DGA Virtual Channels for DGB) |
|                                      | 49-72 (DGA Virtual Channels for DGC) |
|                                      | 73-96 (DGA Virtual Channels for DGD) |
| SLC <sup>®</sup> 96 carrier Mode III | Odd Channels 01-47                   |
|                                      | Odd Channels 49-95 (DGA Virtual      |
|                                      | Channels for DGC)                    |
| DMB                                  | 01-85                                |

2. Enter cross-connect command for segment of multipoint circuit. See Figure 5.5-1 for construction of TC-field.

**NOTE:**

TERM can be added to 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]  
<tc> = TRSP{MUX/TRB}

**Figure 5.5-1. Construction of TRSP Trunk Conditioning**

3. Repeat the procedure to connect remaining segments to the bridge.
4. To see all conference legs, enter:

**RTRV-CRS-T0::<npc No.>-ddd::T0;**

Where: <npc No.>ddd = NPC number of virtual NPC and "ddd"  
is conference number.

---



---

## **DS0 Signals: Change Termination (TLA/TLR) or Conference Bridge Parameters**

# 5.6

---

### **When to Use**

Use this procedure to change the termination state. Command options allow changing the state of all the bridge terminations or all except the one named in the NOT field.

---

### **Related Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to change the termination state.

1. Enter the following command:

```
ED-PRMTR-T0:[xy]:<npc No.1>-ddd[&&-eee],<npc No.2>-jjj[&&-  
kkk]:[ww]:[INCL]:{TERM|RLS}{F/T/B/L/G/A}[:NOT-<npc No.3>-vvv];  
CHG-TL-T0:[xy]::[ww]:kk:TERM{F/T/B/L/G/A}[:NOT-<npc  
No.3>-vvv];
```

Where:

- <npc No.1> = NPC number on FROM side, extended (for example, 001) or hierarchical (for example, 01-1-01).
- <npc No.2> = NPC number on TO side. See <npc No.1>.
- ddd/jjj = Channel number on NPC.
- eee/kkk = Optional, last channel of range.
- TERM|RLS = Desired state, (TERM) terminated or 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.3>-vvv" below.
- NOT-<npc No.3>-vvv = One leg specified that is NOT to be changed with all others.
- kk = Testport number (01-96).
- INCL = Optional, needed if channel in command is red special service circuit or a CUS circuit.



**NOTE:**

The termination state or TLP (transmission level point) of a conference bridge circuit cannot be changed using the above command 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 following command:

```
ED-PRMTR-T0:[:<npc No.1>-ddd,<npc No.2>-jjj]::[INCL]:  
[TLP-snn-smm,NG-nn,ES-ee];
```

Where:

- <npc No.1> = NPC number on FROM side, extended (for example, 001) or hierarchical (for example, 01-1-01).
- <npc No.2> = NPC number on TO side. See <npc No.1>.
- ddd/jjj = Channel number on NPC.
- INCL = Optional, needed if channel in command is red special service circuit or a CUS 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).



**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 RDLD/CUS word will occur if special service circuits were changed.
-



---

## DS0 Signals: Disconnect Cross-Connected Circuit

# 5.7

---

### When to Use

Use this procedure to disconnect a cross-connected DS0 circuit.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to disconnect a cross-connected circuit.

1. Familiarize yourself with the disconnect circuit command as follows:

```
{DISC-CRS|CRS1|BDCST}-T0:<npc No.1>-ddd[&&-eee],\
<npc No.2>-jjj [&&-kkk][&<npc No.3>-nnn...]::\
[INCL]:[OOS][,DCC][,CONV]:[PRIOUT];
```

Where:

|                |   |                                                                                                                                                            |
|----------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CRS            | = | To disconnect 2-way CONN CRS circuit;                                                                                                                      |
| CRS1           | = | To disconnect 1-way CONN CRS1 circuit; and                                                                                                                 |
| BDCST          | = | To disconnect broadcast circuit.                                                                                                                           |
| <npc No.1>     | = | NPC number on one side (FROM); either extended (for example, [0]001) or hierarchical (for example, 01-1-01).                                               |
| ddd            | = | Channel number : 1 through 24 for DE-type, 1-96 for DS-type; 1 through 85 for MB-type; 1-ddd for VI-type NPC).                                             |
| 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 BDCST only; entered with next-to-last disconnection to convert the remaining circuit to 2-way CONN circuit.                                   |
| INCL           | = | Optional, to allow disconnection of circuit with RDLD 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 BDCST 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 ampersand. The optional listing goes in the field after the "<npc No.2>-jjj" in the command.
  - When using individual DISC 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.
3. If you need to check for RDLD or CUS channel designations, enter one of the following commands:  
 For specific channel(s):  
**RTRV-PRMTR-T0::<npc No.>-ddd[&&-eee]::MARK;**  
 For NPC numbers:  
**RTRV-PRMTR-T1::<npc No.>[&&[&]-<range>]::MARK;**
4. Enter the appropriate disconnect command. For 1-way circuits, the sides must be entered like the CONN-CRS1 or NOMTH (no match) denial will result; you may need to use **RTRV-PRMTR-T0::\<npc No. 1>-ddd::FROM;** 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.

5. 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 BDCST has been fully disconnected, last tributary disconnected.
6. If additional legs of a multipoint circuit must be disconnected, repeat the procedure as needed.





---

## DS0 Signals: Move Facility End Points

# 5.8

---

### When to Use

This procedure presents the alternate cross-connect command. This command moves the facility end points of existing cross-connection(s) from the original facility NPCs to other facility NPCs.

---

### Before You Begin



#### CAUTION:

*Performing this procedure incorrectly can interrupt service. Familiarize yourself with the procedure and commands before beginning and perform each step of the procedure in the order given.*

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to move facility end points.

1. If you do not know whether the NPCs and unit equipment are in-service and not failed or pested, enter:

**RTRV-STATE-EQPT::UNIT-[q]q:ALL;**  
for the unit(s).



**NOTE:**

The out-of-service, failed, and pested conditions are indicated by the presence of 1s in those columns for each pack. Unequipped packs are indicated by dashes.

2. See Figure 5.8-1 and Figure 5.8-2 for two examples of ED-CRS-T0 commands showing the connections after the commands execute.

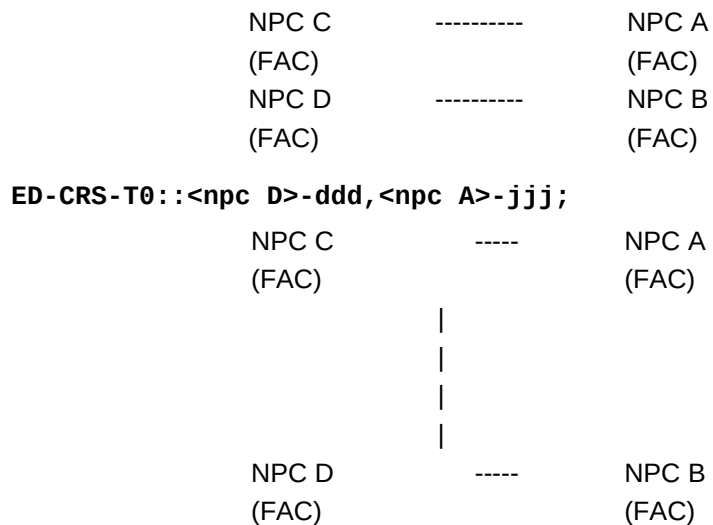
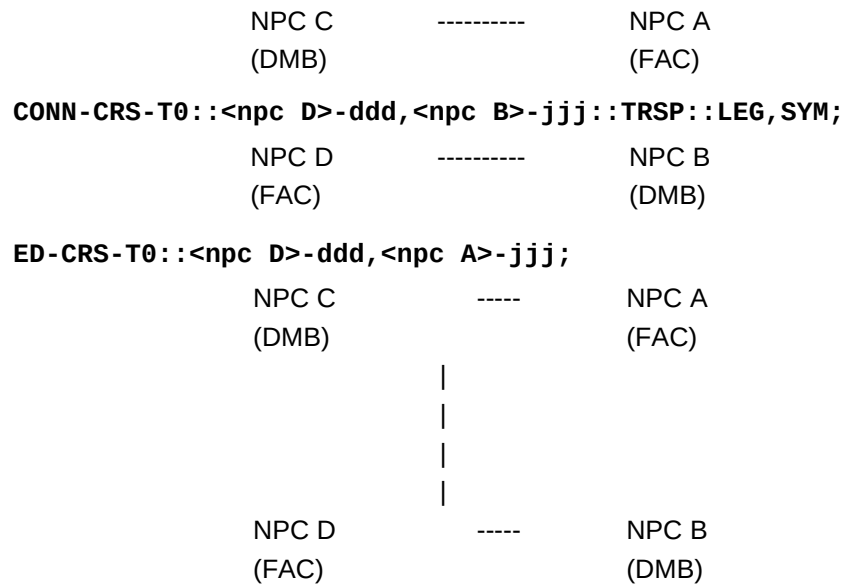


**Figure 5.8-1. Facility-to-Facility Move**




---

**Figure 5.8-2. Facility Leg-to-DMB Move**

3. Examine the following command restrictions:
  - All the involved NPCs must have in-service (and not failed or pested) status.
  - The new NPC channel can be currently mapped to a 2-way, 2-point circuit or unmapped.
  - None of the involved NPCs can be: type PB or PC, *SLC* carrier type DS, interface unit types IU or TI, or clear-DS1 types (xyz = 9-9).
  - The TC (trunk conditioning) of the circuit to be moved must be appropriate for the new circuit. A cross-connection with robbed-bit signaling for the D4 bank line format is not appropriate for NPCs grown with the T1DM line format.
4. To move a facility leg to a different DMB using the alternate cross-connection, establish a temporary facility leg connection to the new desired DMB which will be used as the new facility termination in the ED-CRS-T0 command.
5. Enter the command with the required termination information as follows:
 

```
ED-CRS-T0:[xy]:<npc No.1>-ddd[&&-eee],
<npc No.2>-jjj[&&-kkk]:[ww]:[INCL];
```

Where:

- xy = Optional, unique id (target id); up to 20 characters.
- ww = Optional, command correlation tag; up to 10 characters.
- <npc No.1> = NPC number of existing type DE or TE termination that is to be moved. Either extended for (example [0]001) or hierarchical (for example, 01-1-01), can be used. .
- &&-eee = Optional, for range of channels on virtual NPC broadcast circuit to be moved to 2-point, 2-way circuit.
- <npc No.2> = NPC number of new desired DE or TE termination.
- &&-kkk = Optional, for range of channels on new NPC to be connected from old virtual NPC broadcast circuits.
- INCL = Optional, to override special service designation of existing circuit to allow the move operation.

- If the ED ...DENY message is received, find the explanation of the denial in the output message and perform corrective action to obtain command completion.

6. Check ED completion message to verify circuit changes.
  7. Repeat the procedure as needed to complete required changes.
-

---

## Clear-DS1 Signals: Cross-Connect Two-Point, Two-Way or One-Way Circuit

# 5.9

---

### When to Use

Use this procedure to connect full bandwidth DS1s (with no framing or channels). For full bandwidth connections, the NPCs on both sides must be grown as clear-DS1 types.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to connect full bandwidth DS1s (with no framing or channels).

1. Familiarize yourself with the commands shown below; the **CRS** is for a 2-way connection and the **CRS1** is for a 1-way connection. The T0 (T zero) keyword indicates a DS0 circuit. The <npc No.1> and <npc No.2> side assignments serve as reference for the CRS1 connection and for test access.

```
CONN-CRS-T1::<npc No.1>,<npc No.2>::[RDLD]\  
[, {CUS|INCL}][ : {NORM,NORM|TERM,TERM}]:[PRIOUT];  
CONN-CRS1-T1::<npc No.1>,<npc No.2>::[RDLD]\  
[, {CUS|INCL}][ : {NORM|TERM}]:[PRIOUT];
```

Where:

CRS/CRS1 = **CRS** for 2-way; **CRS1** for 1-way.  
<npc No.1> = NPC number of one side (FROM), either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

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.

<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>.

RDLD = Optional; to designate red special service circuit.

CUS = Optional; to designate customer controlled channels.

INCL = Optional; to remove previous CUS channel designation.

NORM|TERM = To specify unterminated, normal (NORM, default) or terminated (TERM), preservice connection.

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.

---

## Clear-DS1 Signals: Cross-Connect Broadcast Circuit

# 5.10

---

### When to Use

This section shows the BDCST 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 with ampersands (&s). 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 RPATH command.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

Use the following commands to establish broadcast circuits.

1. Familiarize yourself with the commands as follows:

Multiple Tributaries (up to 8):

```
CONN-BDCST-T1::<npc No.1>,<npc No.2>[&<npc No.3>]\  
[&<npc No.4>]::[RDLD][,{CUS|INCL}]\  
[:{NTR|LPD|CONV}];
```

Single Tributary:

```
CONN-BDCST-T1::<npc No.1>,<npc No.2> ::  
[RDLD][,{CUS|INCL}][:{NTR|LPD|CONV}];
```

Where:

- <npc No.1> = Broadcast NPC number, either extended (for example [0]001) or hierarchical (for example, 01-1-01).
- <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 BDCST.
- RDLD = 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.



**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.
-



---

**Clear-DS1 Signals: Disconnect  
Cross-Connected Circuit**

# 5.11

---

**When to Use**

Use this procedure to disconnect a clear-channel cross-connected circuit.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to disconnect a cross-connected circuit.

1. Familiarize yourself with the commands as follows:

For Clear-Channel DS1s:

```
{DISC-CRS|CRS1|BDCST}-T1::<npc No.1>,<npc No.2>\
[&<npc No.3>...]::[INCL]:[OOS][,CONV]:[PRIOUT];
```

Where:

- CRS = To disconnect 2-way CONN CRS circuit;
- CRS1 = To disconnect 1-way CONN CRS1 circuit; and
- BDCST = To disconnect broadcast circuit.
- <npc No.1> = NPC number on one side (FROM); either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <npc No.2> = NPC number on other side (TO); see FROM side.
- <npc No.3> = NPC number and first channel on other (up to 8 total) tributaries to be disconnected.
- CONV = Optional for BDCST only; entered with next-to-last disconnection to convert the remaining circuit to 2-way CONN circuit.
- INCL = Optional, to allow disconnect of circuit with RDLD 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 BDCST 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>&<npc No.4>..." where each NPC and the first channel of range is listed with ampersand. The optional listing goes in the field after the "<npc No.2>" in the command.

- When using individual DISC 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. If you need to check for RDLD or CUS designations, enter the following commands:

**RTRV-PRMTR-T1::<npc No.>[&&[&]-<range>]::MARK;**

4. Enter the appropriate disconnect command from Step 1.



**NOTE:**

For 1-way circuits, the sides must be entered like the CONN-CRS1 or NOMTH (no match) denial will result; you may need to use **RTRV-PRMTR-T0:[xyz]:<npc No.>-ddd:[ww]:FROM;** to find the sides of a 1-way connection.

5. 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 BDCST 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 of a multipoint circuit must be disconnected, repeat the procedure as needed.



**When to Use** This command establishes a TS0 to non-TS0 cross-connection. A cross-connect mode must be chosen to prevent the TS0 Frame Alignment Signal (FAS) from being transmitted to a non-TS0 time slot.

---

**Before You Begin** The FROM NPC containing the TS0 must be grown as a PAxyz or THxyz NPC type. The TOX NPCs containing the non-TS0 tributaries must be grown as PAxyz, PBxyz, PCxyz, or THxyz NPC types.

---

**Related Information** For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to establish a TS0 to non-TS0 cross-connection. A cross-connect mode must be chosen to prevent the TS0 Frame Alignment Signal (FAS) from being transmitted to a non-TS0 time slot.

1. Enter the following command:

```
CONN-CRS-T0::<npc No. 1>-ddd,<npc No. 2>-jjj::\
[ {PFW-abcdefg&ijklmno|NFW} ] : [ {NORM,NORM|TERM,TERM} ] ;
```

Where:

<npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number for FROM NPC.

jjj = Channel number for TO NPC:

000-030 on CEPT type NPCs grown as CAS  
000-031 on CEPT type NPCs grown as NSA.

One of the channel numbers specified (ddd or jjj) must be channel 000 (TS0), while the other channel number (jjj or ddd) must be a number other than channel 000 (non-TS0).

The NPC containing the TS0 channel must be a PA or TH type NPC, while the NPC containing the non-TS0 channel can be either a PA, PB, PC, or TH type NPC.

PFW = Psuedo Frame Word; used to select Mode 1 of TS0 Cross-Connect.

abcdefg = Value of the Pseudo Frame Word.

This value replaces the Frame Alignment Signal (Bits 2 - 8) of the Frame Word being transmitted from the TO NPC to the FROM NPC.

Values for bits a-g:

"0" = Sets the corresponding bit to 0

"1" = Sets the corresponding bit to 1.

ijklmno = Value of the Pseudo Frame Word.

This value replaces the Frame Alignment Signal (Bits 2 - 8) of the Frame Word being transmitted from the FROM NPC to the TO NPC.

Values for bits i-o:

"0" = Sets the corresponding bit to 0

"1" = Sets the corresponding bit to 1

NFW = Non Frame Word; used to select Mode 2 of TS0 Cross-Connect.

NORM,NORM = Cross-connection in the normal state.

TERM,TERM = Cross-connection in the terminated state.

---





---

|                    |                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to establish a broadcast cross-connection between Time Slot 0 (TS0) and non-TS0 facilities. |
|--------------------|----------------------------------------------------------------------------------------------------------------|

This command establishes a broadcast for a TS0 channel of a source (FROM) NPC to up to 8 non-TS0 tributary channels of the TO NPC. A conference may have any number of tributaries, depending on the frame configuration. Additional tributaries can be added to the broadcast by using subsequent CONN-BDCST-TO commands.

---

|                         |                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | The FROM NPC containing the TS0 must be grown as a PAxyz or THxyz NPC type. The TOX NPCs containing the non-TS0 tributaries must be grown as PAxyz, PBxyz, PCxyz, or THxyz NPC types. |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------|
| <b>Related Information</b> | For additional information, see Volume I, Chapter 5, <i>Cross-Connections and Disconnections</i> . |
|----------------------------|----------------------------------------------------------------------------------------------------|

---

---

## Instructions

---

Use this procedure to establish a broadcast cross-connection between Time Slot 0 (TS0) and non-TS0 facilities.

1. Enter the following command:

```
CONN-BDCST-T0::<npc No. 1>,<npc No. 2>-jjj\  
[&<npc No. 3>-nnn&..];
```

Where:

<npc No.1> = FROM NPC (source) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

000 = TS0; Channel 000.

<npc No.2> = TO NPC (tributary) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

jjj = TO channel number:

000-030 for CEPT type NPCs grown as CAS

000-031 for CEPT type NPCs grown as NSA

<npc No.3> = TO NPC (tributary) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

nnn = TO channel number:

000-030 for CEPT type NPCs grown as CAS

000-031 for CEPT type NPCs grown as NSA

---

**When to Use**

Use this procedure to do any of the following:

- To change the spare national and international bits in TS0.
- To enable or disable monitoring of the national and international bits in TS0.
- To change the NPC non-frame word setting in TS0.

---

**Related Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to change TS0.

1. To change the spare national and international bits in TS0 (TS0-abcdefgh), enter:

**ED-PRMTR-EQPT::NPC-<npc No. 1>[&&-<npc No. 2>]::\  
TS0-abcdefgh;**

Where:

<npc No.1> = The NPC number or the first NPC in the range, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = The last NPC number in the range, either extended (for example, [0]001) or hierarchical (for example, 01101). The two NPC numbers must be in the same unit.

TS0 = Time Slot 0.

abcdefgh = Spare bits in TS0.

Each variable (a through h) may be set to a specific value for a desired performance.

Variable action on corresponding TS0 bit:

"0" or "1" - Set TS0 bit to this value

"P" - Received bit is passed through (cross-connected) unchanged

"-" - Neither the variable nor the TS0 bit is changed

2. To enable or disable monitoring on the national and international bits in TS0 without removing the NPC from service, enter the following command:

**ED-PRMTR-EQPT::NPC-<npc No. 1>[&&-<npc No. 2>]::\TS0M-abcdefgh;**

Where:

<npc No.1> = The NPC number or the first NPC in the range, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = The last NPC number in the range, either extended (for example, [0]001) or hierarchical (for example, 01101). The two NPC numbers must be in the same unit.

TS0M = Time Slot 0 Monitor.

abcdefgh = TS0 Monitor bits.

Variable action on corresponding TS0M bit:

"0" or "1" - Set TS0M bit to this value.

"P" - Received bit is passed through (cross-connected) unchanged.

"-" - Neither the variable nor the TS0M bit is changed.

3. To change the NPC non-frame word setting:

**ED-PRMTR-EQPT::NPC-<npc No. 1>[&&-<npc No. 2>]:\NFS-abcdefghi;**

Where:

<npc No.1> = The NPC number or the first NPC in the range, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = The last NPC number in the range, either extended (for example, [0]001) or hierarchical (for example, 01101). The two NPC numbers must be in the same unit.

NFS = Non-Frame Word setting.

abcdefghi = TS0 Monitor bits.

Variable action on corresponding NFW setting bit:

"0" or "1" - Set NFW bit to this value.

"P" - Received bit is passed through (cross-connected) unchanged.

"-" - Neither the variable nor the NFW bit is changed.



**When to Use**

This command disconnects a two-way, two-point TS0 cross-connect circuit.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

---

## Instructions

---

This command disconnects a two-way, two-point TS0 cross-connect circuit.

1. Enter

```
DISC-CRS-T0::<npc No. 1>-ddd,<npc No. 2>-jjj::  
[INCL]:[OOS][,DCC]:[PRIOUT];
```

Where:

<npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd = Channel number for FROM NPC.

<npc No.2> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

jjj = Channel number for TO NPC.

000-023 for North American NPCs

000-030 for CEPT type NPCs grown as CAS

000-031 for CEPT type NPCs grown as NSA

One of the channel numbers specified (ddd or jjj) must be channel 000 (TS0), while the other channel number (jjj or ddd) must be a number other than channel 000 (non-TS0).

OOS = Out-of-Service.

DCC = Disconnect code.

INCL = Inclusive.

PRIOUT = Priority Output

---



---

**When to Use**

This command disconnects up to eight tributary legs from the source of a broadcast TS0 cross-connection.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

1. Enter

```
DISC-BDCST-T0::<npc No. 1>-ddd[&&-eee],\  
<npc No. 2>-jjj\\ [&<npc No. 3>-nnn&..]::\  
[INCL]:[OOS][,DCC][,CONV];
```

Where:

<npc No.1> = FROM NPC (source) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

000 = TS0; Channel 000.

eee = Optional; the width of the conference backbone (if any).

<npc No.2> = TO NPC (tributary) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

jjj = TO channel number:

000-030 for CEPT type NPCs grown as CAS

000-031 for CEPT type NPCs grown as NSA

<npc No.3> = TO NPC (tributary) number, either extended (for example, [0]001) or hierarchical (for example, 01101).

nnn = TO channel number :

000-030 for CEPT type NPCs grown as CAS

000-031 for CEPT type NPCs grown as NSA

CONV = Convert; given to disconnect the one-way tributaries from the broadcast circuit and convert the circuit to a two-way, two-point circuit.

OOS = Out-of-Service.

DCC = Disconnect code.

INCL = Inclusive.

---

## Subrate: Cross-Connect Two-Point, Circuit

# 5.17

---

|                    |                                                                  |
|--------------------|------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to cross-connect a two-point subrate circuit. |
|--------------------|------------------------------------------------------------------|

---

|                         |                                                                                                                                                                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | To establish a loopback connection, the same numbers must be entered for the FROM and TO sides; loopback is not allowed with the SCNT command. The terminated connection sends the UMC (unassigned multiplexer code) on both sides of the connection as a preservice or testing condition. |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------|
| <b>Related Information</b> | For additional information, see Volume I, Chapter 5, <i>Cross-Connections and Disconnections</i> . |
|----------------------------|----------------------------------------------------------------------------------------------------|

---

## Instructions

Use this procedure to cross connect a two-point circuit.

1. Enter the appropriate command. Although not shown, channel ranges (&&-eee, &&-kkk) are allowed for channels established to subrate as DS0A.

Normal Connection:

```
CONN-CRS-TS::<npc No.>-ddd[-ff[&&-mm]],<npc No.2>-jjj\  
[-ll[&&-nn]]:RATE-rr;
```

Terminated Connection:

```
CONN-CRS-TS::<npc No.>-ddd[-ff[&&-mm]],<npc No.2>-jjj\  
[-ll[&&-nn]]:RATE-rr:TERM,TERM;
```

Where:

<npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

<npc No.2> = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

rr = The cross-connect circuit rate 24, 48, 96, or 56 (for 2.4, 4.8, 9.6, or 56 kb/s). This rate must be equal to or lower than the rates of the customer signals.

TPT = Two-Point (optional). Retained only for DACS/SRDC compatibility.

ddd = FROM channel number within the digroup.

ff = The FROM customer number; optional for DS0A channel.

mm = Optional, for last customer number in a continuous range of DS0B customers. Extra ampersand required for hierarchical.

jjj = The TO channel number within the digroup (being addressed by the command).

ll = The TO customer number; optional for DS0A channel.

nn = Optional, for last customer number in a continuous range of DS0B customers. .Extra ampersand required for hierarchical.

2. To familiarize yourself with query command, enter the following command for the NPC and channel(s):  
**RTRV-CRS-TS: : , npc No. > -ddd [&& -eee] ; .**
  3. To see which subrate plug-in is used for the cross-connection, enter  
**RTRV-EQPT-TS: : <npc No. > -ddd -ff : : SRHDW ;**
-



---

## Subrate: Connect Multipoint Circuit (with DSPU)

# 5.18

---

### When to Use

Use this procedure to create an MJU block and the subrate cross-connections that connect to it.

The subrate circuit that connects to the control leg of the first MJU block in an MJU tree is also called the master control leg. The subrate circuit number, channel number, and NPC number for that subrate circuit defines the MJU tree and must be specified in any cross-connect or disconnect command dealing with that MJU tree. MJU blocks transmit data from the control leg to all branches.

---

### Before You Begin

Before using this procedure, note the following:

- The rate of subrate circuits that are processed by a single MJU tree must always be the same. Thus, the master control leg and all the branches must be connected to subrate circuits operating at the same rate.
- All subrate circuits that are cross-connected by this command must first be established.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to connect multipoint circuit (with DSPU).

1. Enter the appropriate command.

Normal:

```
CONN-CRS-TS:<npc No.>-ddd[-ff]::MJU-ssss:\
[MA-tttt,u]:\
[<branch>][,<branch>][,<branch>][,<branch>;
```

Terminated:

```
CONN-CRS-TS::<npc No.>-ddd[-ff]::MJU-ssss:\
[Rate-rr]:[,MA-tttt,u]:{[<branch>][,<branch>]\
[,<branch>][,<branch>]:TERM,TERM;
```



### NOTE:

The involved channels from the facility control leg and any branches must already be established to the subrate equipment.

Where:

- |             |                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| {SCON SCNT} | = Command verb. Selects type of connection, either normal two-way subrate or two-way, terminated in which unassigned multiplexer channel (UMC) is sent towards the upstream and downstream branches. If there are no branches, the command will be denied. |
| rr          | = The cross-connect circuit rate 24, 48, 96, or 56 (2.4, 4.8, 9.6, or 56 kb/s); optional for DS0A. This rate must be equal to or lower than the rates of any connecting leg or branch customer rate.                                                       |
| <npc No.>   | = NPC number of multipoint master (control leg of MJU 1), either extended (for example, [0]001) or hierarchical (for example, 01-1-01).                                                                                                                    |
| ddd         | = Channel number within the NPC digroup.                                                                                                                                                                                                                   |
| ff          | = Customer number.<br>Optional for DS0A channel (if used with DS0A, it must be 01).                                                                                                                                                                        |
| ssss        | = MJU number (1-9999) of MJU being addressed.                                                                                                                                                                                                              |
| MA (ttt,u)  | = Optional, used for tandem MJU connection.<br>The tttt is the MJU number (1-9998) of the preceding MJU, and u is the branch on that MJU which connects to the control leg MJU sss.                                                                        |
| <branch>    | = Optional, to connect branch of MJU sss. Each                                                                                                                                                                                                             |



branch consists of **BRI <npc>jjj[/ll]** which are given by the following definitions.

- BRI** = Branch number (1 through 4) on MJU ssss.
- <npc No.>** = NPC number of facility termination of branch.
- jjj** = Channel number within the digroup.
- ll** = Customer number. Optional for DS0A channel (if used with a DS0A, it must be 01).

2. To see the subrate plug-in used for the connection, enter  
**RTRV-EQPT-TS: :<npc No.>-ddd-ff: :SRHDW;**



---

**Subrate: Connect 19.2-kb/s  
Multipoint Circuit (with External  
MJU Shelf)**

# 5.19

---

**When to Use** Use this procedure to connect 19.2-kb/s multipoint circuit with external MJU shelf.

---

**Before You Begin** To use the external 19.2-kb/s MJU, DS0B customer signals must already be multiplexed into adjacent 9.6-kb/s subrate customer positions of a DS0 channel. This customer signal can then be cross-connected to the control leg of the MJU for bridging to the branches. Other MJUs can be connected in tandem to the first for additional bridging.

---

**Related Information** For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to connect 19.2-kb/s multipoint circuit with external MJU shelf.

1. Check circuit records to see which channels will be connected to the MJU control and branch legs.
2. See Table 5.19-1 for the channel assignment in the DS1 signal going to the MJU plug-in. The MJU circuits are configured by using DS0 cross-connect commands to access the MJU control leg and branches.



**NOTE:**

Each MJU plug-in connects to the DACS II by a DS1 line and contains the circuitry for four MJUs; these MJU circuits are accessed by the channel assignment in the DS1 signal. Up to 12 MJUs (for 12 DS1s) can be mounted on an MJU shelf.

**Table 5.19-1. External MJU Channel Assignment**

| Channel | MJU Function      | Channel | MJU Function      |
|---------|-------------------|---------|-------------------|
| 1       | MJU 1 Control Leg | 13      | MJU 3 Control leg |
| 2       | MJU 1 Branch 1    | 14      | MJU 3 Branch 1    |
| 3       | MJU 1 Branch 2    | 15      | MJU 3 Branch 2    |
| 4       | MJU 1 Branch 3    | 16      | MJU 3 Branch 3    |
| 5       | MJU 1 Branch 4    | 17      | MJU 3 Branch 4    |
| 6       | Unused            | 18      | Unused            |
| 7       | MJU 2 Control Leg | 19      | MJU 4 Control leg |
| 8       | MJU 2 Branch 1    | 20      | MJU 4 Branch 1    |
| 9       | MJU 2 Branch 2    | 21      | MJU 4 Branch 2    |
| 10      | MJU 2 Branch 3    | 22      | MJU 4 Branch 3    |
| 11      | MJU 2 Branch 4    | 23      | MJU 4 Branch 4    |
| 12      | Unused            | 24      | T1DM Framing      |

3. Which type 19.2-kb/s signals are being connected to MJU shelf?
  - If DS0A (single customer), continue with Step 4.
  - If DS0B (multiple customers), proceed to Step 6.

**DS0A Customer Signal (Continue Here)**

4. Enter the appropriate commands to connect facility channels to the appropriate channels going to the MJU plug-in. See Table 5.19-1 for MJU channel assignments.

Normal Connection:

**CONN-CRS-T0::<npc No.>-ddd,<npc No.2>-jjj::<tc>:RDLD;**

Terminated Connection:

**CONN-CRS-T0::<npc No.>-ddd,<npc No.2>-jjj::  
<tc>:RDLD[:TERM,TERM];**

The terminated connection sends a UMC (unassigned multiplexer code) toward the facilities for testing or to hold the circuit in a preservice condition.

Where:

- <npc No.1> = NPC number for FROM side, either extended (for example, [0]001) or hierarchical (for example, 01-1-01). The side assignments serve as references for test access connections.
- <npc No.2> = NPC number for TO side. See <npc No.1>.
- ddd = Channel number within the FROM digroup.
- jjj = Channel number within the TO digroup.
- <tc> = Trunk conditioning to be sent on connecting channels if carrier to NPC fails.  
**TRSP, MUX** recommended.
- RDLD = To designate red lined special circuit; normally used for subrate data circuits.
- RDC = Optional, to designate red special service circuit.

5. Check completion message to verify correct entries.

#### **DS0B Customer Signals (Continue Here)**

6. Enter the appropriate command to connect the customer signals (established to DSPU) to channels from the MJU (established to DSPU). See Table 5.19-1 for MJU channel assignment.

Normal Connection:

**CONN-CRS-TS::<npc No.>-ddd[-ff[&&-mm]],\  
<npc No.2>-jjj[-ll[&&-nn]]:RATE-rr;**

Terminated Connection:

**CONN-CRS-TS::<npc No.>-ddd[-ff[&&-mm]],\  
<npc No.2>-jjj[-ll[&&-nn]]:RATE-rr:TERM,TERM;**



**NOTE:**

The terminated connection sends a UMC (unassigned multiplexer code) on the channels for testing or to hold the circuit in a preservice condition.

Where:

- <npc No.1> = FROM NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <npc No.2> = TO NPC number.
- rr = The cross-connect circuit rate 96, or 56 (for 9.6, or 56 kb/s). This rate must be equal to or lower than the rates of the customer signals.
- TPT = Two-Point (optional). Retained only for DACS/SRDC compatability.
- ddd = FROM channel number within the digroup.
- ff = The FROM customer number; see Table 5.19-2.
- mm = Optional, for last customer number in a continuous range of DS0B customers.
- jjj = The TO channel number within the digroup (being addressed by the command).
- ll = The TO customer number; see Table 5.19-2.
- nn = Optional, for last customer number in a continuous range of DS0B customers. Extra ampersand required for hierarchical.

7. Check completion message to verify correct entries.

**Table 5.19-2. Subrate Customer Numbers**

| Rate | DS0A<br>Numbers (Note 1) | DS0B Customer<br>Numbers (Note 2) |
|------|--------------------------|-----------------------------------|
| 9.6  | 01                       | 01 through 05                     |
| 56   | 01                       | 01                                |

**Notes:**

1. Range of channels allowed with DS0A
2. Range of customers allowed with DS0B

---

**Substrate: Change Two-Point  
Terminate and Leave State**

# 5.20

---

**When to Use**                      Use this procedure to change terminate and leave state for two-point circuits.

---

**Related  
Information**                      For additional information, see Volume I, Chapter 5, *Cross-Connections and  
Disconnections*.

---

## Instructions

---

Use this procedure to change terminate and leave state for two-point circuits.

1. To request a change in the termination status of a cross-connected circuit (or range of circuits), enter the following command:

```
ED-PMTR-T0 : [s]abc-ddd[&&-eee], [t]ghi-jjj[&&-kkk] : :  
[INCL] : {TERM|RLS}{F|T|B|L|G|A} : NOT-[u]rst-vvv
```

Where:

FROM = From.

TO = To.

[s]abc = The 3 or 4-digit nonhierarchical FROM NPC number.

[t]ghi = The 3 or 4-digit nonhierarchical TO NPC number.

[u]rst = The 3 or 4-digit nonhierarchical NPC number not affected by this.

ddd = FROM channel number.

jjj = TO channel number.

eee = FROM channel number denoting the end of a range.

kkk = TO channel number denoting the end of a range.

vvv = Channel number not affected by this command.

TERM = Terminate.

RLS = Release. The direction of transmission to be terminated or released is given by the letter following the request:

F Towards the FROM direction

T Towards the TO direction

B Towards both terminations

L Towards the facilities (multipoint connection only)

G Towards the bridge (multipoint connection only)

A Towards the facilities and the bridge (multipoint only)

INCL = Inclusive. To change the parameters on a channel or range of channels including one or more channels marked as a Red Circuit, use the INCL keyword.

NOT = Not. The NPC is not not affected by this command.

2. If COMPLD message is received, check completion message to verify changes.



---

**Substrate: Change Multipoint  
Terminate and Leave State**

# 5.21

---

**When to Use**                      Use this procedure to change the terminate and leave state for multipoint circuits.

---

**Related  
Information**                      For additional information, see Volume I, Chapter 5, *Cross-Connections and  
Disconnections*.

---

## Instructions

---

Use this procedure to change the terminate and leave state for multipoint circuits.

1. To change the terminate and leave state of the control leg or branch associated with the addressed MJU in a subrate multipoint circuit, enter:

```
ED-PRMTR-TS::<npc No.>-ddd[-ff]::\  
MJU-ssss:[BRi]:{TERM|RLS}-m;
```

**NOTE:**

The TO and BR fields control how the terminate and leave is applied. When BR is not used, the TO side faces the control leg downstream, and the FROM side faces upstream to the external facility termination or branch of cascaded MJU (for MJU other than 0001). When BR is used (for MJU other than 0001), the TO faces upstream to the branch of the specified MJU, and the FROM faces downstream to another MJU or facility termination.

Where:

- m = Direction of terminate and leave change (F, T, B).
- <npc No.> = TO NPC number of the master leg, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- ddd = TO channel number within the digroup.
- ff = TO customer number. Optional when channel is DS0A.
- ssss = MJU identification number addressed by this command (1 through 9999).
- i = Optional, to change state of branch (1 through 4) on MJU ssss.

2. Check completion message to verify changes.
-

---

**When to Use**

Use this procedure to change the master for a multipoint circuit.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

Use this procedure to change the master for a multipoint circuit.

1. If you want to see the whole multipoint circuit first, enter the following command using the multipoint master for the NPC and channel:

**RTRV-PRMTR-TS::<npc No.>-ddd-ff;**

2. To change the external facility termination associated with the multipoint control leg of a subrate multipoint circuit from an existing digroup and channel to a new digroup and channel, enter:

**ED-CONN-TS::<npc No.1>-ddd[-ff]:,<npc No.2>-jjj  
[-ll]::MPTM;**

Where:

- ddd = channel number within the digroup of the old control leg external facility termination.
- ff = Customer number. Optional when channel is a DS0A.
- <npc No.1> = NPC number (of the old control leg), either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- <npc No.2> = NPC number (of the new control leg).
- jjj = Channel number within the digroup of the new control leg external facility termination.
- ll = Customer number and is optional when channel is a DS0A.



**NOTE:**

All branches are left with their existing external and internal connections. The external facility termination associated with the original connections is left established to the subrate feature with a UMC (unassigned multiplexer channel) code inserted towards the old facility.

3. Check completion message to verify changes.
-

---

**Substrate: Disconnect Two-Point  
Circuit**

# 5.23

---

**When to Use**

Use this procedure to disconnect a substrate circuit in both directions.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

Use this procedure to disconnect a subrate circuit in both directions.

1. Enter:

```
DISC-CRS-TS::<npc No.1>-ddd[-ff],<npc No.2>-jjj  
[-ll]::[RATE-rr];
```

Where:

- ff = TO customer number.
- <npc No.1> = FROM NPC number, either extended (for example, [0]001) hierarchical (for example, 01-1-01).
- ddd = FROM channel number within the digroup (being addressed by the command).
- <npc No.2> = TO NPC number.
- jjj = TO channel number within the digroup (being addressed by the command).
- ll = TO customer number (optional for DS0A channel).



**NOTE:**

The FROM and TO designations enable the addressing of a direction of transmission in a subrate circuit (subrate is connected as a two-way circuit). FROM or TO can be either external facility for any subrate command. The association of FROM or TO to an external facility is valid only for the command it is being used in. The next time you use the same command and external facilities, FROM or TO can be specified as the other external facility.

2. Check completion message to verify changes.
-

---

## Substrate: Disconnect Multipoint Bridge

# 5.24

---

### When to Use

Use this procedure to disconnect multipoint branch circuits in both directions. The MJU remains connected to the circuit. The command can disconnect up to four branches of one MJU at one time.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

Use this procedure to disconnect multipoint branch circuits in both directions.

1. To disconnect multipoint branch circuits in both directions, enter:

```
DISC-CRS-TS::<npc No.>-ddd[-ff]::MJU-ssss:  
[RATE-rr]:<branch>[,<branch>][,<branch>][,<branch>;
```

Where:

- <npc No.> = Multipoint master (MJU 1) NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01)
- ddd = Channel number within the digroup of the multipoint master (MJU 1).
- ff = TO customer number.
- ssss = MJU identification number addressed by this command (1 through 9999).
- <branch> = Branch to be disconnected. Each branch consists of **BRi <npc No.>jjj[/ll]** which is explained by the following definitions:
  - BRi = Branch number of MJU ssss (1 through 4).
- <npc No.> = NPC number of the branch.
  - jjj = Channel number within the digroup (<npc No.>).
  - ll = Customer number. Optional for DS0A channel (if used with a DS0A, it must be 01).

2. Check completion message to verify changes.
-



---

**Substrate: Disconnect Multipoint  
Master**

# 5.25

---

**When to Use**

Use this procedure to disconnect a multipoint master.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

---

Use this procedure to disconnect a multipoint master.

1. To delete MJU(s) and disconnect customers in both directions, enter:

```
DISC-CRS-TS::<npc No.>-ddd[-ff]::\  
MJU-ssss:[RATE-rr]:[ALL];
```

Where:

- <npc No.> = NPC number of multipoint master for the circuit, either extended (for example, [0]001) or hierarchical (for example, 01-1-01)
- ddd = Channel number on multipoint master.
- ff = Customer number on multipoint master.
- ssss = Identification number (1 through 9999) of MJU to be deleted. If multiple MJUs are to be deleted, MJU ssss identifies the MJU at which to start the deletion.
- ALL = Optional, to delete cascaded MJUs (up to 20). If the ALL keyword is omitted, only MJU ssss will be deleted provided no branches are connected to that MJU.
- rr = Circuit rate (24, 48, 96 or 56).

2. Check completion message to verify changes.
-

---

**When to Use**

Use the following procedure to re-direct DS0 signals.

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to re-direct DS0 signals.

The following procedure is for redirecting DS0 signals.

1. Bridge the DS0 signals using the command:

```
SW-BCAST-T0::<npc No.1>ddd[&&-eee],<npc No.2>\  
jjj[&&-kkk]:[ww]:[INCL];
```

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range. (Three ampersands (&s) are required for hierarchical.)

<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-T0::<npc No.1>ddd[&&-eee],<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, 01-1-01).

ddd, jjj = Channel numbers for the beginning of a channel range.

eee, kkk = Optional, channel numbers for the end of a channel range. (Three ampersands (&s) are required for hierarchical.)

<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 CGA.

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 BDCST or virtual circuit (i.e., all the channels of a BDCST leg must be within the channel range of the ROLL command).

**NOTE:**

If the OLD NPC contains a 24-channel cross-connect with the AIS option, the ROLL command must have a 24-channel range.

3. Disconnect the bridged circuits using the following command:

**NOTE:**

The *disconnect* step may also be referred to as *cut*.

**SW-DISC-T0::<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, 01-1-01).
- ddd = Channel numbers for the beginning of channel range.
- eee = Optional, channel numbers for the end of channel range. (Three ampersands (&s) are required for hierarchical.)
- 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:

```
RTRV-ROLL-T0:[<xy>]:{NPC-<npc No.1>[&&-<range> |  
ALL[,UNIT-[q]q]}[:w];
```

```
RTRV-CRS-T1::MAP;
```

---

---

## Re-Direct DS1 Signals: Network Element

# 5.27

---

### When to Use

Use this procedure to redirect DS1 signals to a network element.

---

### Related Information

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

## Instructions

Use this procedure to redirect DS1 signals to a network element.

1. Bridge the DS1 signals using the command:

**SW-BCAST-T1::<npc No.1>,<npc No.2>:[INCL];**

Where:

- <npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).(Three ampersands (&s) are required for hierarchical.)
- <npc No.2> = New NPC number. (See <npc No.1>.)
- INCL = Optional, used to force bridging of RDC or CUS channels.

2. Redirect the DS1 signal using the command:

**SW-ROLL-T1::<npc No.1>,<npc No.2>:\  
:[INCL]:[FRC]:[OOS]:[TWAY];**

Where:

- <npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).(Three ampersands (&s) are required for hierarchical.)
- <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 CGA.
- OOS = Optional, used to force a roll **FROM** an NPC which is OOS.

3. Remove the bridged circuits using the following command:

**SW-DISC-T1::<npc No.1>:[OOS];**

Where:

- <npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- OOS = Optional, used to disconnect an NPC that is OOS.



4. Verify that the redirection of DS1 signals has been successful using the following commands:

```
RTRV-ROLL-T1: : {NPC-<npc No.1>[&&-<range> | \
ALL[, UNIT-[q]q]};
RTRV-CRS-T1: :MAP;
```

---



---

## Re-Direct DS1 Signals: Non-Network Element

# 5.28

---

**When to Use** Use this procedure to redirect a DS1 signal using the DSX-1 patch panel.

---

**Related  
Information** For additional information, see Volume I, Chapter 5, *Cross-Connections and  
Disconnections*.

---

## Instructions

Use this procedure to re-direct DS1 signals using the DSX-1 patch panel.

If a spare facility is not available to perform a coordinated roll with another network element, you can redirect an entire traffic carrying DS1 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.

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-T1::<npc No.1>,<npc No.2>[&&-<range>]::;**

**RST-EQPT::NPC-<npc No.2>[&&-<range>]::[SIDE-s];**

Where:

<npc No.1> = Source NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

<npc No.2> = Destination NPC number. (See <npc No.1>.)

<range> = Optional, NPC range. (See <npc No.1>.)

3. Redirect the DS1 signal using the following command:

**SW-ROLL-T1::<npc No.1>,<npc No.2>::\**  
**[INCL]:[FRC]:[OOS]:[TWAY];**

Where:

<npc No.1> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01). (Three ampersands (&s) are required for hierarchical.)

<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 CGA.

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-EQPT::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, 01-1-01).
- <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 subrate).

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-EQPT::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, 01-1-01).
- <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-T1::<npc No.2>,<npc No.1>:\**  
**: [INCL]:[FRC]:[OOS]:[TWAY];**

Where:

- <npc No.2> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).(Three ampersands (&s) are required for hierarchical.)
- <npc No.1> = New NPC number. (See <npc No.2>.)
- TWAY = Optional, used for two-way roll (bridge and roll combined).

- <npc No.2> = Old NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).(Three ampersands (&s) are required for hierarchical.)
- INCL = Optional, used to force roll of RDC or CUS channels.
- FRC = Optional, used to force roll **TO** an NPC that is in CGA.
- OOS = Optional, used to force roll **FROM** an NPC that is OOS.

10. Disconnect <npc No.2> using the following command:

**SW-DISC-T1::[s]abc::[OOS];**

Where:

- <npc No.2> = NPC number. Can be either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
- OOS = Optional, used to disconnect an NPC that is OOS.

11. Remove <npc No.2> from service using the following command:

**RMV-EQPT::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, 01-1-01).)
- <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 subrate).

12. Remove the bridging repeater.

---

**DSP Application: Cross-Connect,  
Change or Disconnect DSP  
Application Connections**

# 5.29

---

**When to Use**

Use this procedure if the application can not disconnect a circuit or a range of circuits between:

- A DSP NPC and a facility terminating NPC
- Two DSP NPCs

---

**Related  
Information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

---

## Instructions

---

Use this procedure if the application can not disconnect a circuit or a range of circuits between:

- A DSP NPC and a facility terminating NPC
- Two DSP NPCs

1. Enter

**DISC-DSP-T0::<npc No.>-ddd[&&-eee],[v]ghi-jjj[&&-kkk]:;**

Where:

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

[v]ghi = TO NPC number, either extended (for example, [0]001) or hierarchical (for example, 01101).

ddd, jjj = Channel numbers.

eee, kkk = Channel numbers, denoting the end of a range

**001-024** - DE, DA, TE, and TA NPC types

**000-031** - PA, PB, PC, and TH NPC types

**001-064** - SD NPC types (except numbers divisible by 4).

---



---

**When to Use**

Use this procedure to report on the application-to-application cross-connections for either:

- An individual application NPC.
- All application NPCs on the frame.

---

**Related  
information**

For additional information, see Volume I, Chapter 5, *Cross-Connections and Disconnections*.

---

---

## Instructions

---

Use this procedure to report on the application-to-application cross-connects for either:

- an individual application NPC
- all application NPCs on the frame

1. Enter the following command:

**RTVR-CRS-APPL::::{<npc No.>|ALL};**

Where:

- |             |                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <npc No.> = | The NPC number of an application; either extended (for example, [0]001) or hierarchical (for example, 01101). This limits the output to only those application-to-application cross-connections that include the application with this NPC number. |
| ALL =       | The command reports on all application-to-application cross-connection in the frame.                                                                                                                                                               |

The output command reports by pseudo channel number the actual application NPC numbers and associated channel numbers that are cross-connected to each other. If only one of the two required cross-connect requests has been received, then the second application channel number is shown as dashes. No actual cross-connect exists when the second channel number is not shown. See command I.51201 in the Command and Message manual for more detail.

---

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---

**When to Use** Use this procedure to add or delete users. After a user is added to the data base, the user can log in on any designated in-service link.

---

**Before You Begin** You must be logged in as frame administrator (user DAX) to perform this task.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

Use the following procedure to add or delete a user.

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:
  - To add a new user on an asynchronous link, enter:  
**CRTE-LGN::::<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:

**CRTE-LGN:::<user id>,<pswd>,NEW;**

Where: <pswd> = Temporary password for user.

4. Check to see if the output screening options need to be changed.
  - 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.
5. Enter the following command:

**SET-PRVG-{USER|TERM}:::<user id>|<link No.>  
:SCR-n[,GR-a&-b&-c&-d&-e&-f][:MCOFF|MCON];**

Where:

USER/TERM = 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.

GR = Optional; field used with SCR 3 or 4 to specify the command groups; enter a "1" for each group 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. DENY messages cannot be disabled.

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:

**RTRV-PRMTR-{MACRO|MAP}:::ATTR:[{<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-LGN:::<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.
-



---

**When to Use**

Use this procedure to recover the default password for user DAX.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

Use 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 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-EQPT::SMEM::;**

3. Test the ESD grounding strap at an ESD station.
4. At the frame, place the ESD grounding strap on your wrist and physically remove the SMEM card from the CPU2.
5. Insert the PASSWORD RECOVERY CARD into the SMEM slot.
6. At the DACS II terminal, enter the following command to move the default password into the frame's RAM memory.

**RST-PASSWD;**

7. Enter the following command:

**RMV-EQPT::SMEM::;**

8. After the command completes successfully, at the frame place the ESD grounding strap on your wrist and remove the PASSWORD RECOVERY CARD.
9. Reinsert the SMEM card (removed earlier) into the SMEM slot and enter the following command:

**RST-EQPT::SMEM:::BKGRND;**

10. Return the PASSWORD RECOVERY CARD to its proper location.
  11. Change the default password to the desired password or leave the default in and have the administrator (or responsible person) change it.
-

---

## Reinstate User with Forgotten Password

# 6.3

---

### When to Use

Use this procedure to assign a temporary password to a user who has forgotten their password.

---

### Related Information

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

To reinstate a user that has forgotten their password, do the following:

1. Assign a temporary password by entering the appropriate command:

**Asynchronous Links** (Snider Protocol):

**CRTE-LGN::::<user id>;**

Message prompts will instruct you to enter the temporary password.

**Synchronous Links** (X.25 Protocol):

**CRTE-LGN::::<user id>[,<user pswd>];**

Where:

- |             |   |                                                                                                                                                                    |
|-------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <user 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).                                                                                                                |

2. After assigning the temporary password, the user can assign his/her personal password.
-

---

|                            |                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to log off another user.                                                                           |
| <b>Before you Begin</b>    | To forcibly log off another user, you must be logged in as the frame administrator and logged in on a different link. |
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 6, <i>Administration</i> .                                        |

---

---

## Instructions

---

1. Enter the following command to log off another user from the system:

**LGT-{USER|TERM}::::{<user id>|<link No.>};**

Where:

USER/TERM = 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.



**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

# 6.5

---

|                    |                                                                                 |
|--------------------|---------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to change input command priorities for the user or the link. |
|--------------------|---------------------------------------------------------------------------------|

---

|                                |                                                                                |
|--------------------------------|--------------------------------------------------------------------------------|
| <b>Related<br/>Information</b> | For related information, refer to Volume I, Chapter 6, <i>Administration</i> . |
|--------------------------------|--------------------------------------------------------------------------------|

---

## Instructions

To change the input command priority for a user or a link, follow these steps:

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:

**RTRV-PRVG-{USER|TERM}::: {<user id>|j[mm][&&p[nn]]|ALL}**

2. Enter the following command to change input command priorities and/or the restricted maintenance option:

**SET-PRVG-{USER|TERM}::: {<user id>|<link No.>[, INCL]}:\n :: [LEV-a&-b&-c&-d&-e&-f] [: {RMON|RMOFF}];**

Where:

|              |   |                                                                                                                                                                                                              |
|--------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USER TERM    | = | Selects whether user or link identification will be used in command.                                                                                                                                         |
| <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 (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 command groupings; enter priority level 0 (excluded), 1 (highest), 2, or 3 (lowest) for all command groups.                                                                    |
| {RMON RMOFF} | = | Restricted Maintenance Option <b>RMON</b> allows the use of certain commands.                                                                                                                                |



---

**When to Use**

This procedure describes how to change the following:

- The message language of the link
- The message language for a user.

---

**Background**

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.

---

**Related Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

To change the message language for a link or user, follow these steps:

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:

```
RTRV-PRVG-{USER|TERM}:::\  
{<user id>|j[mm][&&p[nn]]|ALL}
```

2. Enter one of the following commands for the appropriate language change:

Change Message Language of the Link:

```
SET-PRVG-TERM:::<link No.>[, INCL]:LANG-{P|M|T};
```

Change Message Language for a Specific User:

```
SET-PRVG-USER:::<user id>:LANG-{P|M|T};
```

Where:

|              |   |                                                                                                                                                                                                              |
|--------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 (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).                                                                                                      |

---

---

**When to Use**

Use this procedure to change the following:

- The NPC addressing of the link
- The NPC addressing for a user.

---

**Background**

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.

---

**Related Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

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:

```
RTRV-PRVG-{USER|TERM}::::\  
{<user id>|j[mm][&&p[nn]]|ALL};
```

2. Enter one of the following commands for the appropriate NPC addressing change:

### Change NPC Addressing of the Link:

```
SET-PRVG-{TERM|ALL}::::<link No.>[, INCL]\  
::NPCAD-{E|X|H};
```

### Change NPC Addressing for a Specific User:

```
SET-PRVG-{USER|ALL}::::<user id>\  
::NPCAD-{E|X|H}
```

Where:

|               |   |                                                                                                                                                                                                              |
|---------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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).                                                                                                                                                          |
| <link No.>    | = | 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) extended, or H for hierarchical (for example, 01-1-01).                                                                                                            |

---

### When to Use

Use this procedure to change the following:

- The output message screen option of the link
  - The output message screen option for a user.
- 

### Background

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.

---

### Related Information

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

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:

```
RTRV-PRVG-{USER|TERM}::::{<user id>| \  
j[mm][&&p[nn]]|ALL}
```

2. Enter one of the following commands for the appropriate output message screening option change:

**Change Message Screening Option of the Link:**

```
SET-PRVG-TERM::::<link No.>:\  
SCR-n[, GR-a&-b&-c&-d&-e&-f][:{MCOFF|MCON}];
```

**Change Message Screening Option for a Specific User:**

```
SET-PRVG-USER::::<user id>:\  
SCR-n[, GR-a&-b&-c&-d&-e&-f][:{MCOFF|MCON}]
```

Where:

|            |   |                                                                                                                                                                               |
|------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 (links 5 and 6).                                                             |
| n          | = | Screening option 1 through 5.                                                                                                                                                 |
| GR         | = | Optional field used with SCR 3 or 4 to specify the command groups; enter a <b>1</b> for each group to be enabled and a <b>0</b> 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 or users). DENY messages are not disable |

---

---

**When to Use**

Use this procedure to check and change the current macro/map storage space setting for all users.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

1. If you want to check the current storage space assigned to user, either for macro files or alternate maps, enter:

**RTRV-PRMTR-{MACRO|MAP}::::SPACE:{<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:

**ED-PRMTR-{MACRO|MAP}::::<space>;**

---



---

## Change Link Removal Permission Option

# 6.10

---

### When to Use

The administrator can use this procedure to change the following:

- The link removal permission of the link
  - The link removal permission for a user
- 

### Related Information

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

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:

```
RTRV-PRVG-{USER|TERM}::::{<user id>|  
j[mm][&&p[nn]]|ALL};
```

2. Enter one of the following commands for the appropriate link removal permission change:

**Change Link Removal Permission of the Link:**

```
SET-PRVG-TERM::::<link No.>[, INCL]:::RLK-{A|I};
```

**Change Link Removal Permission for a Specific User:**

```
SET-PRVG-USER::::<user id>:::RLK-{A|I};
```

- If the command is denied, find the reason for the denial in the output message and perform corrective action to obtain command completion.

Where:

- <user id> = User identification (2 to 8 alphabetical characters).
  - <link No.> = 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.
-

**When to Use**

Use this procedure to log on to the frame.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

1. Enter the following command to log in to the system:

**LGN-USER:::<user id>[,<pswd>];**

Where:

<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.

2. If you want to see who is currently logged on, enter:

**RTRV-PRVG-USER::LOG::[ALL];**

The ALL option allows the frame administrator to see all users on the frame.

---

**When to Use** Use this procedure to log off the frame.

---

**Related Tasks** To log off another user from the frame, refer to GT 6.4.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

---

## Instructions

---

1. Enter the following command to log off the system:

**LGT-{USER|TERM}::::{<user id>|<link No.>};**

Where:

USER/TERM = 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.

---

---

**When to Use** Use this procedure to change your own password.

---

**Background** 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.

---

**Related Tasks** To reinstate a user who has forgotten their password, refer to GT 6.3.

To recover the default password for user DAX, refer to GT 6.2.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

---

## Instructions

---

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-LGN:::<old pswd>:<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-LGN::;**

and respond to system prompts to enter old and new passwords.

---



**When to Use** Use this procedure to create an alternate map.

---

**Before You Begin** The alternate map feature can only be used by users with USER IDs who access the system with a login.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

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:

**RTRV-PRVG-{USER|TERM}::::<user id>|<link No.>;**

Where:

USER|TERM = Selects whether user or link identification will be used in the command.  
<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 you want to change output screening, see *Change Output Message Screening* and enter the SET PRVG 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::::<map name>;**

Where: <name> = Name of new alternate map, consisting of up to seven alphanumeric characters starting with a letter.

4. Enter CONN-CRS commands.

You will receive an OK acknowledgment for each allowable entry. See Figure 6.14-1 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 CONN CRS. 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 CONNs.

**NOTE:**

When editing an existing map, you will not see previous entries.

```
ENT-MAP:::NEWMAP;  
CONN-CRS-T0::01-1-01-01,01-1-02-01::TRSP;  
CONN-CRS-T0::01-1-03-01,01-1-04-01::TRSP;  
CONN-CRS-T0::01-1-05-01&&-24,01-1-06-01&&-  
24::TRSP;  
END
```

---

**Figure 6.14-1. 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 CONN 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 CONNs may already be involved in other connections.
  - If you want to see the contents of the alternate map, enter the appropriate command:

For CONNs:

```
RTRV-MAP-COM:::<name>[:<user id>];
```

For NPCs:

```
RTRV-MAP-EQPT::NPC::<name>[:<user id>];
```

---



---

## Create Alternate Map Using the Picture Option

# 6.15

---

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to create an alternate map using the picture option. |
|--------------------|-------------------------------------------------------------------------|

---

|                         |                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------|
| <b>Before you Begin</b> | Only users with USER IDs who access the system via a login can use the alternate map feature. |
|-------------------------|-----------------------------------------------------------------------------------------------|

---

|                      |                                            |
|----------------------|--------------------------------------------|
| <b>Related Tasks</b> | To edit an existing map, refer to GT 6.16. |
|----------------------|--------------------------------------------|

---

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 6, <i>Administration</i> . |
|----------------------------|--------------------------------------------------------------------------------|

---

## Instructions

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:

**RTRV-PRVG-{USER|TERM}:::<user id>|<link No.>;**

Where:

USER|TERM = Selects whether user or link identification will be used in command.

<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 you want to change output screening, see *GT 6.8 Change Output Message Screening* and enter the SET PRVG 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:::<map name>;**

Where: <name> = Name of new reference map, consisting of up to seven alphanumeric characters starting with a letter.

4. Enter the NPCs into the reference map using the following command:

**ED ADD NPC**

See Figure 6.15-1 for an example of map construction. When "OK" is received, enter the next component command (if any).

If you recognize an input error, you can delete the line (explained later) and enter another ED-ADD-MAP 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 ED-ADD-MAP command.

**ENT-MAP:::NEWMAP;**

**ED-ADD-MAP::NPC-01-1-07&&-01-1-12;**

**END**

---

**Figure 6.15-1. 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 ED-ADD-MAP commands that accompany the completion message to determine what changes are needed and refer to the EDIT-MAP part of this chapter 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-PRMTR-MAP:::<new name>,<refmap>;**

- If the command is denied, find the reason for the denial in the output message and perform corrective action to obtain command completion.
  - If the system returns **COMPLD 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 **COMPLD 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 CONNs:

**RTRV-MAP-COM:::<name>[:<user id>;**

For NPCs:

**RTRV-MAP-EQPT::NPC::<name>[:<user id>;**

---





---

## Edit an Existing Alternate/Reference Map

# 6.16

---

**When to Use** Use this procedure to edit an existing alternate map or reference map.

---

**Before you Begin** 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.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

Use this procedure to edit an existing alternate/reference 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:

**RTRV-PRVG-{USER|TERM}::::<user id>|<link No.>;**

Where:

USER|TERM = Selects whether user or link identification will be used in command.  
<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.



**NOTE:**

If you want to change output screening, see *Change Output Message Screening* and enter the SET PRVG command.

2. Enter the following command to begin the editing session:

**ED-MAP::::<map name>;**

Where: <name> = Name of map to be edited; the map must already exist (must have been created).



**NOTE:**

If the command is denied, find the reason for the denial in the output message and perform corrective action to obtain command completion.

3. Use the following items to change the alternate map as required:

- **Add New Cross-Connections.** Enter the complete CONN CRS commands (which are appended to the map).
- **Remove Cross-Connections.** Enter the following to remove CONNs from an alternate map:

**CONN-CRS-T0::<npc No.1>-ddd[&&-eee], \**  
**<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 ED ADD NPC command to add NPCs to a reference map.
- **Remove NPCs from a Reference Map.** Enter the following command to remove NPCs from a reference map:

**ED-DLT-MAP::NPC-{<npc No.>&&[&]-<range>|<npc No.1>&-<npc No.2>};**

Where:

- range = Continuous range of NPCs entered with ampersands (&&) and a dash or a listing of up to 10 NPCs with a &- separating each one. Three ampersands are required for hierarchical range.



**NOTE:**

Only NPCs that were explicitly added via the ED ADD NPC can be deleted via the ED 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 CONN messages that accompany the completion message to determine what changes are needed. The terminations for those CONNs 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 CONNs:

**RTRV-MAP-COM:::<name>[:<user id>];**

For NPCs:

**RTRV-MAP-EQPT::NPC::<name>[:<user id>];**

---

**When to Use**                      Use this procedure to activate an alternate map.

---

**Before You Begin**



**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.*

---

**Related  
Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

1. Enter the following command if you want to see the contents of the alternate map first:

**RTRV-MAP-COM:::<name>:[user id];**

or enter the following to list NPCs:

**RTRV-MAP-EQPT::NPC::<name>:[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):

**EXC-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 RDLD 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 (CONNs); 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 in the output message and perform corrective action to obtain command completion.

- 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 DENY 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:

**RTRV-CRS-T1::<npc No.>[&&[&]-<range>]::MAP;**

Where:

- <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).
  - <range> = Optional, last NPC of a continuous range. Three ampersands (&s) are required for hierarchical range.
-





---

**When to Use**                      Use this procedure to retrieve alternate map information from the system.

---

**Related  
Information**                      For related information, refer to Volume I, Chapter 6, *Administration*.

---

---

## Instructions

---

1. Enter the appropriate command for the information you are looking for:

- **Filename List and Execution Attributes:**

**RTRV-PRMTR-MAP:::ATTR:[{<user id>|ALL|<name>}];**

- **Contents of the Map:**

**RTRV-MAP-COM:::<name>[:<user id>];**

- **Listing of NPCs in the Map:**

**RTRV-MAP-EQPT::NPC[:<user id>];**

- **Allotted Map File Storage Space:**

**RTRV-PRMTR-MAP:::SPACE:[{<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.
-

---

|                    |                                                                        |
|--------------------|------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to delete an alternate map package from the system. |
|--------------------|------------------------------------------------------------------------|

---

|                   |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Background</b> | 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. |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 6, <i>Administration</i> . |
|----------------------------|--------------------------------------------------------------------------------|

---

## **Instructions**

---

1. Enter the following command if you want to examine the alternate map before deleting:

**RTRV-MAP-COM::::<name>:[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 id];**.

---

**When to Use** Use this procedure to create a macro and edit a macro.

---

**Before You Begin** 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.

---

**Related Information** For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

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:

**RTRV-PRVG-{USER|TERM}:::<user id>|<link No.>;**

Where:

|            |   |                                                                                                   |
|------------|---|---------------------------------------------------------------------------------------------------|
| USER TERM  | = | Selects whether user or link identification will be used in command.                              |
| <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 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.

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::<line number>;**

- **DELETE Command.** This command allows you to delete the line specified.

**DELETE::<line number>;**



**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::{<starting line>|END}[-{<ending line>|END}],  
{<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**;

**NOTE:**

**LIST:{<starting line>|END}[-{<ending line>|END}];** Consider the following when constructing macros:

SET PRVG commands can be included in a macro to shut off (MCOFF) macro component COMPLD messages.

A STOP keyword can be included in component RMV/RST, CONN, and DISC 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, LGT), 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 ...COMPLD message with COND 00 exceptions.

**Example 1:** This example shows how to create a macro. Figure 6.20-1 shows the component commands in the macro that do the following:

- **Line 1.** This command disconnects channel 01 of NPC 001 from channel 01 of NPC 003. If the command fails, the macro stops.
- **Line 2.** This command cross-connects channel 01 of NPC 001 to channel 01 of NPC 005. (The connection uses transparent trunk conditioning.)
- **Line 3.** This command cross-connects channel 02 of NPC 001 to channel 02 of NPC 005. (The connection uses transparent trunk conditioning.)
- **Line 4.** This command cross-connects channel 03 of NPC 001 to channel 03 of NPC 005. (The connection uses transparent trunk conditioning.)



- **Line 5.** This line outputs all connections on NPC 001.

```
DISC-CRS-T0::001-01,003-01:::STOP;OK
CONN-CRS-T0::001-01,005-01::TRSP;OK
CONN-CRS-T0::001-02,005-02::TRSP;OK
CONN-CRS-T0::001-03,005-03::TRSP;OK
```

---

**Figure 6.20-1. Example of Macro (Extended NPC Numbering)**

**Example 2:** Figure 6.20-2 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 01-1-01, the last line entered in the example would be: **RTRV-CRS-T1::#01-#02-#03::MAP;**

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);
DISC-CRS-T0::#01-#01-#01-#01,#01-#01-#02-
#01:::STOP;OK
CONN-CRS-T0::#01-01,#02-01::TRSP;OK
CONN-CRS-T0::#01-02,#02-02::TRSP;OK
CONN-CRS-T0::#01-03,#02-03::TRSP;OK
```

---

**Figure 6.20-2. Example of Macro (Extended NPC Numbering)**

---



**When to Use**                      Use this procedure to execute a macro package.

---

**Background**                      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 COMPLD or DENY 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.

---

**Related Information**              For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

1. Enter the following command if you want to see the contents of the macro before executing:

**RTRV-MACRO-COM:::<name>:[<user id>];**

Where:

<name> = Macro name.

<user id> = Optional, to allow frame administrator to see another user's macro.

- If SET MCOFF and SET MCON commands are not included in the macro and you want to shut off component command completion messages, enter:

**SET-PRVG-{USER|TERM}:::\<user id>|<link No.>::MCOFF;**

Where:

USER|TERM = Selects whether user or link identification will be used in command.

<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 you want to stop the execution of the macro after it has started (in the next step), enter:

**ABT-PROC:::<link No.>;**

Where:

<link No.> = 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, ...&10];**

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 SET MCOFF was entered before executing the macro, enter:  
**SET-PRVG-{USER|LINK}: : : <user id>|**  
**<link No.>: : MCON;** to allow completion messages again.
-

**When to Use**

Use this procedure to retrieve macro information from the system.

---

**Related  
Information**

For related information, refer to Volume I, Chapter 6, *Administration*.

---

## Instructions

---

1. Enter the appropriate command for the information you are looking for:

- **Filename List:**

**RTRV-PRMTR-MACRO:::ATTR:[{<user id>|ALL}];**

- **Contents of the Macro:**

**RTRV-MACRO-COM:::<name>[:<user id>];**

- **Allotted Map/Macro File Storage Space:**

**RTRV-PRMTR-MACRO:::SPACE[:{<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.

---



---

|                    |                                                               |
|--------------------|---------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to delete a macro package from the system. |
|--------------------|---------------------------------------------------------------|

---

|                         |                                                                                                                                                                                                    |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | 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. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 6, <i>Administration</i> . |
|----------------------------|--------------------------------------------------------------------------------|

---

## Instructions

---

1. Enter the following command if you want to examine the macro file before deleting it:

**RTRV-MACRO-COM:::<name>:[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 id];**

---

### When to Use

Use this procedure if you are looking for a procedure to use the Delete Feature Package command. This command is used to reduce the feature package set by a prior single feature.



**NOTE:**

The execution of this command requires DACS II superuser privileges. The frame must be in the **MCOND** (maintenance condition) state at execution.



**NOTE:**

Because of the impact of this command on the available features, the following dialogue will be displayed by DACS II.  
ARE YOU SURE?  
The user must respond with an affirmative (Y) for the command to be executed.

---

### Instructions

---

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

LGN-USER:::DAX;

2. Perform a manual backup from RAM to MEM (PMEM and SMEM together)

CPY-MEM:::WKG, MEM;

3. Place the frame in Maintenance Condition

RST-EQPT::MC::MCOND;

4. Check the Feature Package running on the frame and identify the one you want to delete :

RTRV-FPKG-NE;

00000001 Basic DS1 Terminations

00000002 Basic CEPT Terminations

00000004 Subate Data

00000008 DIRECT SLC 96 and Series 5 Carrier Interface

00000010 DS3 Terminations

00000020 Enhanced CEPT, C-Bit, C-Bit Filtering, RPSFI

00000040 Switched Teleconferencing

00000080 Capacity Expansion Frame

00000100 Enhanced DS1 Performance Monitoring

00000200 DS0/DS1 Service Roll Feature

00000400 AT&T Security Warning Message

00000800 Nx64kbit Test Access

00001000 Clear 2 Mbit/s Interface

00002000 TS0 to Non TS0 Cross-connection

00004000 2 MB/S Roll Feature

00008000 Spare

00010000 TRT/FT Features Intervention Level

00020000 DS3 Hybrid

5. Delete the identified Feature Package :

[I.37301]

DLT-FPKG:[<xy>]::[ww]:nnnnnnnn;

The completion message will indicate the old Feature Package and the new one :

[O.37301]

```
<xy> yy-mm-dd hh:mm:ss LINK-n[vv]
M DLT FPKG:::[ww]:nnnnnnnn COMPLD
/* [O.37301] */
/* Old FPI:New FPI */
"aabbccdd:kkttuuvv"
;
```

6. Restore the MC

RST-EQPT::MC;

---



### Contents

---

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| ■ Recovering after Memory Card Failure   | GT 7.2-1 |
| ■ Removing a Single-Latch Circuit Pack   | GT 7.3-1 |
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| ■ Removing a Double-Latch Circuit Pack   | GT 7.5-1 |
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| ■ Upgrading From an EMTC to a EMTC2      | GT 7.7-1 |

---





---

|                    |                                                                     |
|--------------------|---------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to archive the DACS II database and executables. |
|--------------------|---------------------------------------------------------------------|

---

|                         |                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | This procedure assumes the MC, PMEM, and SMEM are functioning properly and the database in RAM and on PMEM are correct. |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------|

---

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Related Information</b> | For related information, refer to Volume I, Chapter 7, <i>Maintenance</i> . |
|----------------------------|-----------------------------------------------------------------------------|

---

## Instructions

Use this 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:

**RTRV-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-EQPT::MC;**

- Reissue the command **RTRV-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:  
**CPY-MEM:::WKG, MEM;**  
Then restore SMEM in the background:  
**RST-EQPT::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-EQPT::SMEM;**
  6. Make sure the ESD grounding strap has been tested according to your company's ESD testing policy. When the command above completes, place the ESD grounding strap on your wrist and physically remove the SMEM card from the CPU2.
  7. 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.

8. 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.
9. Enter the following command to restore the SMEM card to service:

**RST-EQPT::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.

---



---

## Recovering after Memory Card Failure

# 7.2

---

### When to Use

Use this procedure to recover after a PMEM or SMEM card failure occurs.

---

### Related Information

For related information, refer to Volume I, Chapter 7, *Maintenance*.

---

## Instructions

Use this recovery procedure when a PMEM or SMEM card failure occurs.

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:

- If the PMEM card fails card diagnostics and the SMEM card passes all tests, then go to Step 2.
  - 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.
  - 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.
  - If the SMEM card fails card diagnostics and the PMEM card passes all tests, then go to Step 5.
  - 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 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 CPU2 pack by entering the following command:  
**RST-EQPT : :MC : :MCOND ;**  
The frame will deny this command if it is already in MCOND.
    - b. After testing the ESD grounding strap at the ESD station, 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.

**CAUTION:**

*Replacing the CPU2 pack will cause a power reset. DO NOT interrupt this reset by pressing the FRAME 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 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.

3. Replace the PMEM card 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 CPU2 pack by entering the following command:

**RST-EQPT : :MC : :MCOND ;**

The frame will deny this command if it is already in MCOND.

- b. After testing the ESD grounding strap at the ESD station, 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.

**CAUTION:**

*Replacing the CPU2 pack will cause a power reset. DO NOT interrupt this reset by pressing the FRAME 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 7. (The old PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card 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 CPU2 pack by entering the following command:

**RST-EQPT::MC::MCOND;**

The frame will deny this command if it is already in MCOND.

- b. After testing the ESD grounding strap at the ESD station, 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.



**CAUTION:**

*Replacing the CPU2 pack will cause a power reset. DO NOT interrupt this reset by pressing the FRAME 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 7. (The PMEM card and the SMEM card may be recycled as future SMEM cards.)
5. If the SMEM card is suspected to be defective, replace the SMEM card with a spare memory card or with an older archive card that may be recycled. Do the following:
    - 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-EQPT::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-EQPT::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-EQPT::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 GT 7.1, *Archiving the Database*.



---

## Removing a Single-Latch Circuit Pack

# 7.3

---

**When to Use** Use this procedure to remove 4- and 8-inch circuit packs with a single latch.

---

**Before You Begin** You can easily damage circuit packs and other hardware by improperly removing them from the frame. Read these notes before beginning the procedure.

 **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.*

---

(Continued on next page)

**Before You Begin  
(Continued)****NOTE:**

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND). Both NPCs associated with a DDC or EDDC should be out of service before the pack can be physically removed/replaced. Entities such as UCs, FTMIs, and FCs should be OOS before they are physically removed/replaced.

**Related  
Information**

For related information, refer to Volume I, Chapter 7, *Maintenance*.

**Instructions**

Use this procedure to remove a single latch 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.

---

**When to Use** Use this procedure to install 4- and 8-inch circuit packs with a single latch.

---

**Before You Begin** You can easily damage circuit packs and other hardware by improper installation. Read these notes before beginning the procedure.

 **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.*

---

(Continued on next page)

**Before You Begin  
(Continued)****NOTE:**

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND). Both NPCs associated with a DDC or EDDC should be out of service before the pack can be physically removed/replaced. Entities such as UCs, FTMIIs, and FCs should be OOS before they are physically removed/replaced.

**Related  
Information**

For related information, refer to Volume I, Chapter 7, *Maintenance*.

**Instructions**

Use this procedure to install a single-latch 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.

---

## Removing a Double-Latch Circuit Pack

# 7.5

---

|                    |                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to correctly remove 12-inch DS3U and 16-inch ECCN circuit packs with double latches. |
|--------------------|---------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                                     |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | You can easily damage circuit packs and other hardware by improperly removing them from the frame. Read these notes before beginning the procedure. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

 **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.*

---

(Continued on next page)

**Before you Begin  
(Continued)****NOTE:**

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND).

---

**Related  
Information**

For related information, refer to Volume I, Chapter 7, *Maintenance*.

---

**Instructions**

Use this procedure to remove a 12-inch DS3U and 16-inch ECCN circuit pack with double latches:

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.
-



---

## Installing a Double-Latch Circuit Pack

# 7.6

---

|                    |                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to correctly install a 12-inch DS3U and 16-inch ECCN circuit packs with double latches. |
|--------------------|------------------------------------------------------------------------------------------------------------|

---

|                         |                                                                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Before You Begin</b> | You can easily damage circuit packs and other hardware by improper installation. Read these notes before beginning the procedure. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

 **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.*

---

(Continued on next page)

**Before You Begin  
(Continued)****NOTE:**

Main controller packs should only be physically removed/replaced when the frame is either Out Of Service (OOS) or in Maintenance Condition (MCOND).

---

**Related  
Information**

For related information, refer to Volume I, Chapter 7, *Maintenance*.

---

**Instructions**

Use this procedure to install a 12-inch DS3U and 16-inch ECCN circuit pack with double latches:

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 bottom latch, press firmly to ensure that the circuit pack is fully seated.
-

---

## Upgrading From an EMTC to a EMTC2

# 7.7

---

### When to Use

Use this procedure to replace the UM56 Enhanced Maintenance (EMTC) circuit pack with a UM75 Enhanced Maintenance (EMTC2) circuit pack.

---

### Related Information

For related information, refer to Volume I, Chapter 7, *Maintenance*.

---

## Instructions

---

Use this procedure to replace the UM56 Enhanced Maintenance (EMTC) circuit pack to a UM75 Enhanced Maintenance (EMTC2) circuit pack.

1. Enter **RST-EQPT::MC::MCOND**; to place the main controller in maintenance condition.
  2. After testing the ESD grounding strap at the ESD station, place the ESD strap on your wrist.
  3. Replace the UM56 circuit pack with a UM75 circuit pack.
  4. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
-

---

## Upgrade KCR1 Circuit Pack With a KCR5

# 7.8

---

### When to Use

Use this procedure if you are looking for a procedure to upgrade a KCR1 circuit pack with a KCR5 circuit pack.

The KCR1 MXR circuit pack is discontinued. The KCR5 EMXR circuit pack is a direct replacement for and provides all the functionality of the KCR1 pack. Enhanced ANSI DS1 Performance Monitoring Feature is additionally supported by the KCR5.



**NOTE:**

**Lucent recommends that you upgrade at least the MXR protection pack KCR1 to KCR5 in all DS3U Units.** Otherwise, in case of failure, the customer may experience a loss of service (depending on the configuration and the failure).



**NOTE:**

Swapping directly from a KCR1 to KCR5 circuit pack will cause a failed Software diagnostic **Hardware Mismatch** when entering the RST MMFG command.



**NOTE:**

The protection pack needs to be swapped first; no re-provisioning is required for it.

---

## Instructions

1. Check the protection state

```
RTRV-STATE-EQPT::UNIT-yy::PROTN;
```

Make sure the protection pack is not protecting any service unit (refer to message 56511 in the Command and Message Manual).

The Protection State of the left-most column (MMFG P) should be USLT, not SLT.

2. Remove the protection pack

```
RMV-EQPT::UNIT-yy::MMFG-P;
```

3. Physically swap the MXR, KCR1 circuit pack with an EMXR, KCR5 circuit pack

4. Restore the protection pack

```
RST-EQPT::UNIT-yy::MMFG-P;
```

### Upgrade the MXR 1 circuit pack :

5. Remove the MXR 1 circuit pack

```
RMV-EQPT::UNIT-yy::MMFG-1;
```

Note the MXR type in the output completion message **MXx00**



#### **NOTE:**

Removing the MMFG will cause an autonomous switch from the service pack to the protection pack.

6. Physically swap the MXR 1, KCR1 circuit pack with an EMXR, KCR5 circuit pack

7. Change the MXR type from MXx00 to EXx00

```
ED-PRMTR-T3::UNIT-yy::DS3-1:TYPE-EXx00;
```

8. Restore the EMXR 1 circuit pack

```
RST-EQPT::UNIT-yy::MMFG-1;
```

**NOTE:**

Restoring the EMXR 1 circuit pack will cause an autonomous switch from the protection pack to the service pack.

9. Proceed from step 5 to 8 for all the MXR circuit pack you need to upgrade from KCR1 to KCR5





---

## **Performance Monitoring General Tasks**

# **8**

---

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---



---

## Change Performance Parameter Thresholds

# 8.1

---

### When to Use

Use this procedure to change performance monitoring thresholds.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

To change performance parameter thresholds, follow these steps.

1. To change the default values for performance parameter thresholds, use the following command:

**ED-OPT-T1::NPC:: {TYPE-mn|ALL}:rr:a,b,c;**

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.

2. To change the facility performance parameter threshold values on a specified NPC without disconnecting and reconnecting provisioned circuits, enter the following command:

**ED-PRMTR-EQPT::NPC-<NPC no.>:[ww]:rr/m[&rr/m][... ]!**

Where:

rr = Facility performance parameter number.  
m = Facility performance parameter threshold index (0 through 3).

3. To change the threshold values for facility performance parameters on all NPCs of a particular type, enter the following command:

**ED-PRMTR-EQPT::TYPE-mnxyz:[ww]:rr/<m>[&rr/<m>][... ]!**

Where:

mnxyz = NPC type.  
rr = Facility performance parameter number.  
m = Facility performance parameter threshold index (0 to 3).

4. To change facility threshold values for one or more NPCs of a particular type or *SLC*<sup>®</sup> bank without disconnecting and reconnecting provisioned circuits, enter the following command:

```
ED-PRMTR-EQPT: :\  
{NPC-<NPC no.>|RT-ffff|DL-ffff|TYPE-mnxyz}:  
[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).
  - ffff = bank identification number (0000 through 9999).
-



---

## Scheduling a Performance Monitoring Report

# 8.2

---

### When to Use

Use this procedure to schedule a performance monitoring report.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

To schedule a performance monitoring report, issue the following command:

```
SCHED-PMREPT-T1::NPC-<npc No.1>[&&-<range>]:\  
:rrrrr,ssss,nn,mm1 <parameter>,llllllllll,locn,\  
aaaaa,ttttt[&&-ooooo][: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                           |
|-----------|---------------------------------------|
| CVP       | Path Coding Violations                |
| CVL       | Line Coding Violations                |
| ESP       | Path Errored Seconds                  |
| ESL       | Line Errored Seconds                  |
| SESP      | Path Severely Errored Seconds         |
| SESL      | Line Severely Errored Seconds         |
| SESF      | Path Severely Errored Framing Seconds |
| CSSP      | Path Controlled Slip Seconds          |
| UASP      | Path Unavailable Seconds              |
| ALLPAR    | All listed parameters                 |



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.

oooo = 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

LK = Link

p[vv] = Up to two administrative links to which the scheduled report output will be transmitted. These parameters take the form of a physical administrative link number followed by a virtual circuit number, if applicable. The user may omit these optional parameters, specify a single link, or specify two links which will both receive all output generated by this scheduled report. If these optional parameters are omitted, the scheduled report output will by default be transmitted only to the link that the schedule command was received on. At the time of report, no PM report shall be sent to a link if it is out of service, or has screening option 1 and the schedule command was not received on that link

q[vv]

---

---

## Checking Performance Monitoring Data

# 8.3

---

### When to Use

Use this procedure to check DS1 performance monitoring data for DA and TA type NPCs.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

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.

**RTRV-PM-T1:: {NPC-<npc No.1>[&&-<range>] | ALL}::\<parameter>,aaaaa,[llllllllll],[locn],[dddd],[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 DA or TA. If this option is selected, only one performance parameter may be queried.                                                                                                                                                                                                                                                                |
| <parameter> = | The performance parameter requested.                                                                                                                                                                                                                                                                                                                                                                      |
| 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 - 134217728 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).                                                                                                                                                                                                                                                                                                                |

- <npc No.1> = The 3- or 4-digit nonhierarchical starting NPC number.
- dddd = The beginning date of the performance monitoring period. Specified in the format MMDD, where MM is the month (01-12) and DD is the day (01-31). The current date can be specified by making dddd = CURD (default). All daily accumulation registers can be retrieved by making dddd = ALL.

**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 ALLPAR cannot be selected for <parameter>.

- tttt = The beginning time of day of the performance monitoring period. Specified in the format HHMM, where HH is the hour (00-24) and MM is the minute (00, 15, 30, 45). The current time can be set by making tttt = CURT (default). All 15-minute accumulation registers can be retrieved by making tttt = ALL.

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.



---

## Clearing Performance Monitoring Data

# 8.4

---

### When to Use

Use this procedure to clear facility performance monitoring parameters for DA and TA type NPCs(FTUs) or DS3 Units.

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.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

Use this procedure to clear performance monitoring parameters.

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.

```
INIT-REG-T1:: {NPC-<npc No.1>[&&-<range>] | ALL}:: \  
<parameter>,[aaaa],[locn],[dddd],[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 DA or TA.<br>If this option is selected, only one facility parameter may be cleared.                                                     |
| <parameter> | = | The monitored parameter accumulation register to be reset.                                                                                                                                     |
| aaaaa       | = | The accumulation time period for the specified parameter: either 15MIN to clear a 15-minute accumulator, or DAILY to clear a daily accumulator. Optional if MONDAT and MONTIM are set to HIST. |



- 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 beginning date of the performance monitoring period to reset. Specified in the format MMDD, where MM is the month (01-12) and DD is the day (01-31). The current date can be specified by making dddd = CURD (default). All near-end/far-end daily and 15-minute registers can be reset by making dddd = HIST (tttt must also be set to HIST).
- tttt = The beginning time of day of the performance monitoring period to reset. Specified in the format HHMM, where HH is the hour (00-24) and MM is the minute (00, 15, 30, 45). The current time can be set by making tttt = CURT (default). All near-end/far-end 15-minute and daily accumulation registers can be reset by making tttt = HIST (dddd must also be set to HIST).

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.
-



---

## Setting the Hybrid DS3 Daily Facility Alarm Reporting Time

# 8.5

---

### When to use

Use this procedure to clear facility performance monitoring parameters for DA and TA type NPCs (FTUs) or DS3 Units.

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.

---

### Related information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

Use this procedure to clear performance monitoring parameters.

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.

```
INIT-REG-T1:: {NPC-<npc No.1>[&&-<range>] | ALL}:: \
<parameter>,[aaaa],[locn],[dddd],[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 DA or TA.

**If this option is selected, only one facility parameter may be cleared.**

- <parameter> = The monitored parameter accumulation register to be reset. One of:

|        |                                       |
|--------|---------------------------------------|
| CVP    | Path Coding Violations                |
| CVL    | Line Coding Violations                |
| ESP    | Path Errored Seconds                  |
| ESL    | Line Errored Seconds                  |
| SESP   | Path Severely Errored Seconds         |
| SESL   | Line Severely Errored Seconds         |
| SEFS   | Path Severely Errored Framing Seconds |
| CSSP   | Path Controlled Slip Seconds          |
| UASP   | Path Unavailable Seconds              |
| ALLPAR | All parameters                        |
| ALLL   | All line parameters                   |
| ALLP   | All path parameters                   |



**NOTE:**

If the value ALLPAR, ALLL, or ALLP 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, or DAILY to clear a daily accumulator. Optional if MONDAT and MONTIM are set to HIST.
- 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 beginning date of the performance monitoring period to reset. Specified in the format MMDD, where MM is the month (01-12) and DD is the day (01-31). The current date can be specified by making dddd = CURD (default). All near-end/far-end daily and 15-minute registers can be reset by making dddd = HIST (tttt must also be set to HIST).
- tttt = The beginning time of day of the performance monitoring period to reset. Specified in the format HHMM, where HH is the hour (00-24) and MM is the minute (00, 15, 30, 45). The current time can be set by making tttt = CURT (default). All near-end/far-end 15-minute and daily accumulation registers can be reset by making tttt = HIST (dddd must also be set to HIST).

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 in the output message and perform corrective action to obtain completion.



---

## Setting the Hybrid DS3 Daily Facility Alarm Reporting Time

# 8.6

---

### When to use

Use this procedure to set:

- The DACS II System clock
- The time for the daily facility alarms
- The parameters to be reported in the daily facility alarms report.

### Related information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

---

## Instructions

---

1. Enter **SCHED-PMREPT-ALL:::[hr-mn-sc],\**  
**{CFA|FAC-X-abcdef|PRIM-X-ghij|MONDAT};**

Where:

|          |   |                                                                                                                                                                                                                                                           |
|----------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hr-mn-sc | = | Time specification:<br>hr - hours (00 through 23)<br>mn - minutes (00 through 59)<br>sc - seconds (00 through 59)                                                                                                                                         |
| CFA      | = | Carrier Failure Alarm.                                                                                                                                                                                                                                    |
| FAC      | = | Facility.<br><br>Request that the reporting of alarms specified by<br>abcdef be enabled.                                                                                                                                                                  |
| abcdef   | = | Facility performance alarm reports enable<br>(hexidecimal).<br><br>Each hexadecimal digit (a through f) represents 4 bits,<br>each of those bits representing a particular facility<br>parameter. Refer to command I.15011 for additional<br>information. |
| PRIM     | = | Primary.<br><br>Requests that reporting of alarms specified by ghij be<br>enabled.                                                                                                                                                                        |
| ghij     | = | Primary Alarm or Parameter-count reports enable.<br><br>Each hexadecimal digit (g through j) represents 4 bits,<br>each of those bits representing a particular facility<br>parameter. Refer to command I.15011 for additional<br>information.            |
| MONDAT   | = | Daily Monitor Starting Time.                                                                                                                                                                                                                              |

---



---

## Checking Hybrid DS3 Performance Monitoring Data

# 8.7

---

### When to Use

Use this procedure to retrieve current and/or historical performance monitoring data for Hybrid DS3 facilities provisioned on KCR8 circuit packs.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

---

1. Enter:

```
RTRV-PM-T3:: {UNIT- [q]q, DS3-c [&&-d] | ALLDS3}:: \
<parameter>, aaaaa, [llllllllll], [dddd], [tttt];
```

Where:

|             |   |                                                                                                                                                                                                                                                                                                                                 |
|-------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNIT        | = | Peripheral unit housing the DS3s.                                                                                                                                                                                                                                                                                               |
| [q]q        | = | Number of unit ranging between 1 and 16.                                                                                                                                                                                                                                                                                        |
| DS3         | = | Hybrid DS3 circuit.                                                                                                                                                                                                                                                                                                             |
| c           | = | The DS3 facility in the unit or the first DS3 of a range of DS3s in the unit.                                                                                                                                                                                                                                                   |
| d           | = | The last DS3 facility of a range of DS3s in the unit.                                                                                                                                                                                                                                                                           |
| ALLDS3      | = | All Hybrid DS3 facilities that are in service are selected.                                                                                                                                                                                                                                                                     |
| <parameter> | = | Name of parameter in the input.                                                                                                                                                                                                                                                                                                 |
| aaaaa       | = | The accumulation time period for the specified parameter:<br>15MIN - Parameter count from a 15-minute accumulator<br>DAILY - Parameter count from a daily accumulator                                                                                                                                                           |
| llllllllll  | = | The discriminating level for the requested parameter. Up direction will report parameters with values $\geq$ the specified level; Down direction will report parameters with values $\geq$ the specified level.<br><br>{0000000000-134217728}U - Discriminating level-up<br>{0000000000-134217728}D - Discriminating level-down |
| dddd        | = | Begin date of performance monitoring period (only allowed if the AI parameter is set to DAILY).<br>HIST - Previous 24-hour accumulators<br>CURD - Current 24-hour accumulators (default)<br>ALL - All daily accumulators (input only)                                                                                           |
| tttt        | = | Begin time of the performance monitoring period (only allowed if the AI parameter is set to 15MIN).<br>HIST - Previous 15-minute accumulators<br>CURT - Current 15-minute accumulators (default)<br>ALL - All 15-minute accumulators (input only)                                                                               |

---

---

## Clearing Hybrid DS3 Performance Monitoring Data

# 8.8

---

### When to Use

Use this command to clear the 15-minute or daily performance monitoring counts for Hybrid DS3 facilities on KCR8 circuit packs.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

---

1. Enter:

```
INIT-REG-T3:: {UNIT- [q]q, DS3-c [&&-d] | ALLDS3}:: \  
<parameter>, aaaaa, [dddd], [tttt];
```

Where:

|             |   |                                                                                                                                                                                                                                                   |
|-------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNIT        | = | Peripheral unit housing the DS3s.                                                                                                                                                                                                                 |
| [q]q        | = | Number of unit ranging between 1 and 16.                                                                                                                                                                                                          |
| DS3         | = | Hybrid DS3 circuit.                                                                                                                                                                                                                               |
| c           | = | The DS3 facility in the unit or the first DS3 of a range of DS3s in the unit.                                                                                                                                                                     |
| d           | = | The last DS3 facility of a range of DS3s in the unit.                                                                                                                                                                                             |
| ALLDS3      | = | All Hybrid DS3 facilities that are in service are selected.                                                                                                                                                                                       |
| <parameter> | = | Name of parameter in the input.                                                                                                                                                                                                                   |
| aaaaa       | = | The accumulation time period for the specified parameter.<br>15MIN - Parameter count from a 15-minute accumulator<br>DAILY - Parameter count from a daily accumulator                                                                             |
| dddd        | = | Begin date of performance monitoring period (only allowed if the AI parameter is set to DAILY).<br>HIST - Previous 24-hour accumulators<br>CURD - Current 24-hour accumulators (default)<br>ALL - All daily accumulators (input only)             |
| tttt        | = | Begin time of the performance monitoring period (only allowed if the AI parameter is set to 15MIN).<br>HIST - Previous 15-minute accumulators<br>CURT - Current 15-minute accumulators (default)<br>ALL - All 15-minute accumulators (input only) |

---

---

## Initialize/Change Hybrid DS3 Threshold Values

# 8.9

---

### When to Use

Use this procedure to initialize and/or change the DACS II threshold data base, which contains the programmable set of selectable alarm thresholds for DS3 facility performance parameters accumulated by DACS II Hybrid MXR circuit packs.

Following DACS II installation, the user-programmable (non-default) values are empty until this **ED-OPT-T3CHG** command initializes them.

---

### Before You Begin

A user-programmable threshold value must first be initialized with this procedure before it can be used in the command **CRTE-EQPT** and the command **ED-PRMTR-T3**.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

Enter the command below to initialize and/or change Hybrid DS3 threshold values:

**ED-OPT-T3:::TYPE-mn:<rr>:a,b,c;**

Where

OPT = Option (i.e., the number that identifies a particular facility performance parameter).

rr = Facility performance parameter number.

Variable <rr> specifies the parameter for which the alarm threshold is being set or changed.

| <rr> | Parameter                          | Interval | Threshold Value Range | Default Threshold Value |
|------|------------------------------------|----------|-----------------------|-------------------------|
| 101  | Code Violations Line               | DAILY    | 0-1073700000          | 3867523                 |
| 102  | Errored Seconds Line               | DAILY    | 0-86400               | 4320                    |
| 103  | Severely Errored Seconds Line      | DAILY    | 0-86400               | 90                      |
| 104  | Code Violations Path               | DAILY    | 0-353870000           | 3867523                 |
| 105  | F&M Bit violations Path            | DAILY    | 0-22096800            | 176947                  |
| 106  | Errored Seconds Path               | DAILY    | 0-86400               | 4320                    |
| 107  | Severely Errored Seconds Path      | DAILY    | 0-86400               | 90                      |
| 108  | Far End Severely Errored Sec. Path | DAILY    | 0-86400               | 90                      |
| 109  | Unavailable Seconds                | DAILY    | 0-86400               | 0                       |
| 111  | Code Violations Line               | 15MIN    | 0-29490750            | 402867                  |
| 112  | Errored Seconds Line               | 15MIN    | 0-900                 | 300                     |
| 113  | Severely Errored Seconds Line      | 15MIN    | 0-900                 | 30                      |
| 114  | Code Violations Path               | 15MIN    | 0-3686175             | 402867                  |
| 115  | F&M Bit violations Path            | 15MIN    | 0-230175              | 18432                   |
| 116  | Errored Seconds Path               | 15MIN    | 0-900                 | 300                     |
| 117  | Severely Errored Seconds Path      | 15MIN    | 0-900                 | 30                      |
| 118  | Far End Severely Errored Sec. Path | 15MIN    | 0-900                 | 30                      |
| 119  | Unavailable Seconds                | 15MIN    | 0-900                 | 0                       |

TYPE = Type of DS3 Circuit.

mn = NPC Type prefix. HX is the NPC Type prefix for an HDS3U DS3 facility.

a = User-programmable threshold setting 1 (m=1) for given parameter <rr>.

Thresholds are entered in free format (1 to 10 digits) separated by commas. Enter a hyphen for values that are not to be changed. For further details, refer to I.38203.

b = User-programmable threshold setting 2 (m=2) for given parameter <rr>.

c = User-programmable threshold setting 3 (m=3) for given parameter <rr>.

---





---

## Select Hybrid DS3 Threshold Values

# 8.10

---

|                            |                                                                                                                                                                                                                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to select one of the defined facility performance parameter threshold values on a specified Hybrid DS3 facility (or facilities) without disconnecting and reconnecting provisioned circuits.                                                                                     |
| <b>Before You Begin</b>    | Threshold values for the designated DS3 facility must already be stored in the DACS II threshold database. Up to 4 threshold values may be stored for each parameter: the default value and up to three user-programmable threshold values. To initialize/change threshold values, refer to GT 8.9. |
| <b>Related Information</b> | For additional information, see Volume I, Chapter 8, <i>Performance Monitoring</i> .                                                                                                                                                                                                                |

---

## Instructions

**Task** Enter the command below to initialize and/or change Hybrid DS3 threshold values:

**ED-PRMTR-T3::UNIT-[q]q::DS3-c[&&-d]:OPT-rr/m[&rr/m][...];**

Where.

UNIT = Unit.

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

DS3 = Digital Signal 3 (44.736 Mb/s rate).

c = DS3 facility number within the unit (1 through 6).

d = DS3 facility number within the unit (1 through 6)

Variable d is used to specify a range of facilities.

OPT = Option.

<rr> = Facility performance parameter number. Variable <rr> specifies the parameter for which an alarm threshold is being selected. See the table below.

m = Facility performance parameter threshold index (0 through 3). Variable m is used to select threshold values previously programmed for <rr>. See I.38203.

0 = default value

1,2, or 3 = one of the user-programmable threshold values.

| <rr> | Parameter                          | Interval | Threshold Value Range | Default Threshold Value |
|------|------------------------------------|----------|-----------------------|-------------------------|
| 101  | Code Violations Line               | DAILY    | 0-1073700000          | 3867523                 |
| 102  | Errored Seconds Line               | DAILY    | 0-86400               | 4320                    |
| 103  | Severely Errored Seconds Line      | DAILY    | 0-86400               | 90                      |
| 104  | Code Violations Path               | DAILY    | 0-353870000           | 3867523                 |
| 105  | F&M Bit violations Path            | DAILY    | 0-22096800            | 176947                  |
| 106  | Errored Seconds Path               | DAILY    | 0-86400               | 4320                    |
| 107  | Severely Errored Seconds Path      | DAILY    | 0-86400               | 90                      |
| 108  | Far End Severely Errored Sec. Path | DAILY    | 0-86400               | 90                      |
| 109  | Unavailable Seconds                | DAILY    | 0-86400               | 0                       |
| 111  | Code Violations Line               | 15MIN    | 0-29490750            | 402867                  |
| 112  | Errored Seconds Line               | 15MIN    | 0-900                 | 300                     |

---

| <rr> | Parameter                          | Interval | Threshold<br>Value Range | Default<br>Threshold<br>Value |
|------|------------------------------------|----------|--------------------------|-------------------------------|
| 113  | Severely Errored Seconds Line      | 15MIN    | 0-900                    | 30                            |
| 114  | Code Violations Path               | 15MIN    | 0-3686175                | 402867                        |
| 115  | F&M Bit violations Path            | 15MIN    | 0-230175                 | 18432                         |
| 116  | Errored Seconds Path               | 15MIN    | 0-900                    | 300                           |
| 117  | Severely Errored Seconds Path      | 15MIN    | 0-900                    | 30                            |
| 118  | Far End Severely Errored Sec. Path | 15MIN    | 0-900                    | 30                            |
| 119  | Unavailable Seconds                | 15MIN    | 0-900                    | 0                             |

---



---

## Query Hybrid DS3 Performance Parameters

# 8.11

---

|                            |                                                                                                                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When to Use</b>         | Use this procedure to display a report on the four threshold values for each of the Hybrid DS3 performance parameters. The report will list both DAILY and 15-MINUTE interval parameters. |
| <b>Before You Begin</b>    | Before you begin this task, you must already grown the HMXR and its associated DS3 facilities.                                                                                            |
| <b>Related Information</b> | For additional information, see Volume I, Chapter 8, <i>Performance Monitoring</i> .                                                                                                      |

## Instructions

---

Enter the command below to initialize and/or change Hybrid DS3 threshold values:

**RTRV-OPT-T3:::mn;**

Where:

OPT = Option.

In the output messages the first value shown following the keyword OPT is the option number. The value immediately following the option number is the default alarm threshold value.

The next three fields show user-programmed values. Any user-programmed values that have not been initialized in the DACS II data base will be shown as -----.

Until they are initialized, user-programmable values cannot be used as valid alarm thresholds.

For Hybrid DS3 facilities (HX type), a programmed alarm threshold value of zero for any performance parameter disables threshold crossing alert messages for that parameter.

TYPE = Type.

mn = NPC type.

|       |                                                   |
|-------|---------------------------------------------------|
| HX    | Hybrid DS3 Facility type                          |
| CVL   | Code Violation for the DS3 Line                   |
| ESL   | Errored Seconds for the DS3 Line                  |
| SESL  | Severely Errored Seconds for the DS3 Line         |
| CVP   | Code Violation for the DS3 Path                   |
| BFMP  | F- or M-bit errors for the DS3 Path               |
| ESP   | Errored Seconds for the DS3 Path                  |
| SESP  | Severely Errored Seconds for the DS3 Path         |
| FSESP | Far End Severely Errored Seconds for the DS3 Path |
| UASP  | Unavailable Seconds for the DS3 Path              |

User-programmed alarm threshold values

<bbbb>First  
<cccc> Second  
<dddd>Third

---

---

## Activate/Deactivate Facility Test Signals

# 8.12

---

### When to Use

Use this procedure to activate/deactivate a facility test signal.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

---

1. To activate a facility test signal, input the following command:

**OPR-TSIG-T1::<npc No.1>::test;**

Where:

|            |   |                                                                 |
|------------|---|-----------------------------------------------------------------|
| <npc No.1> | = | NPC number.                                                     |
| test       | = | Test signal type. The following table lists valid test signals. |

| test | Explanation                        |
|------|------------------------------------|
| YELT | Yellow test signal                 |
| HDTS | High density test signal           |
| LDS  | Low density test signal            |
| QRTS | Quasi-random test signal           |
| ILBA | In-band loopback activate signal   |
| ILBD | In-band loopback deactivate signal |
| LRET | Loopback retention signal          |



**NOTE:**

The loopback retention signal is only applicable to NPCs grown with ESF framing.

2. To deactivate a facility test signal, input the following command:

**RLS-TSIG-T1::<npc No.1>::test;**

Where:

|            |   |                                                                        |
|------------|---|------------------------------------------------------------------------|
| <npc No.1> | = | NPC number.                                                            |
| test       | = | Test signal type. The following list contains valid test signal types. |

- ALLP – All Payload Test Signals. Including high density test signal, low density test signal, quasi-random test signal, in-band loopback activate signal, in-band loopback deactivate signal, and yellow test signal in D4/T1DM mode.
  - ALLD – All Data Link Test Signals. Including yellow test signal in ESF mode, loopback retention signal, and ANSI bit-oriented far-end loopback activate/deactivate sequences.
  - ALL – All Test Signals in both the payload and data link.
-



---

## Activate/Deactivate Facility Loopback

# 8.13

---

### When to Use

Use this procedure to activate/deactivate a facility loopback.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

---

1. To activate a facility loopback, input the following command:

**OPR-LPBK-T1::<npc No.1>::loop:locn;**

Where:

<npc No.1> = NPC number.  
locn = Loopback location. Either NEND for near-end or FEND for far-end.  
loop = Loopback type: LINE: PYLD (payload) or NTWK (network).

**⇒ NOTE:**

LINE and NTWK loopbacks are only applicable to FEND.  
Commands to activate/deactivate LINE/NTWK LPBK with NEND will be denied.

2. To deactivate a facility loopback, input the following command:

**RLS-LPBK-T1::<npc No.1>::loop:locn;**

Where:

<npc No.1> = NPC number.  
locn = Loopback location. Either NEND for near-end or FEND for far-end.  
loop = Loopback type: LINE: PYLD (payload) or NTWK (network).

---

---

**Activate/Deactivate Facility Loopback  
for TE or TH Type NPC within a  
Hybrid DS3**

# 8.14

---

**When to Use**

For TE or TY 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.

---

**Related  
Information**

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

---

## Instructions

---

1. To activate a facility loopback, input the following command:

**OPR-LPBK-T1::<npc No.1>::loop[t]: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.                                                                                                                  |

2. To deactivate a facility loopback, input the following command:

**RLS-LPBK-T1::<npc No.1>::loop:locn;**

Where:

|            |   |                                          |
|------------|---|------------------------------------------|
| <npc No.1> | = | NPC number.                              |
| locn       | = | Loopback location. Only NEND is allowed. |
| loop       | = | Loopback type. Only LINE is allowed.     |

---

---

## Check and Operate Hybrid DS3 Loopback

# 8.15

---

### When to Use

Use this procedure to check the loopback status for a Hybrid DS3 signal terminated within a Hybrid DS3U and to activate or release the loopback.

---

### Related Information

For additional information, see Volume I, Chapter 8, *Performance Monitoring*.

---

## Instructions

---

1. If you want to check the current loopback status, continue with Step 2.
  - If you want to activate or release the Hybrid DS3 loopback, proceed to Step 4.
2. Enter the command to check the loopback status as follows:

**RTRV-STATE-EQPT::UNIT-<[q]q>::LPBK;**

Where:

<[q]q> = Unit number for the Hybrid DS3U (1 through 16).

- If RTRV ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
3. Read the loopback state for each DS3 signal within the unit by referring to the detailed output messages documented in the Command and Message Manual for this command.
  4. To change the loopback state, enter

**OPR-LPBK-DS3::UNIT-<[q]q>:MMFG-a::LPBK-d[t];**

Where the variables d, t, q, and a may be set as shown:

d = Loopback Type.

Code **E** when you want to activate an equipment loopback (diagnostic local loopback), such that the outgoing DS3 signal is looped back towards the DACS II equipment

Code **F** when you want to activate a facility loopback (line local loopback), such that the incoming DS3 signal is looped back towards the facility.

Code **N** when you want to stop the loopback .

t = Loopback signal AIS specifier.

Code **N** when you do not want to send AIS upstream towards the facility, assuming you coded d=E, while the DS3 signal is looped back towards the DACS II equipment.

If **t** is not specified for an equipment loopback request, the default is to send AIS upstream towards the facility while the DS3 signal is looped back towards the DACS II equipment.

Code **N** when you do not want to send AIS downstream towards the equipment, assuming you coded d=F, while the DS3 signal is looped back towards the facility.

Again, if **t** is not specified for a facility loopback, the default is to send AIS downstream towards the equipment while the DS3 signal is looped back towards the facility.

[q]q = Hybrid DS3 Unit number (1 through 16).

a = The number of the MMFG within the unit (P,1 through 6). P means the protection MMFG.

- If OPR ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.

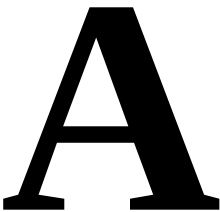
5. Check the output message to verify the loopback state.





---

# Command Denials



---

## Contents

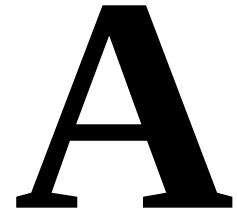
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---

## Command Denials



---

### Background

#### Introduction

DACS II will respond with a command denial message when an incorrect command is entered, there is trouble in the system (either software or hardware), or when an operator enters a command which has been restricted by the system administrator.

---

#### Objective

This chapter provides information to recognize clear command denials.

---

## Clear Command Denials

### Overview

When a user inputs an invalid command, the DACS II system denies the command and displays a denial message. The two types of denial messages are:

- Frame Denial Message
- Hexadecimal Condition Code Message.

### Denial Message Command Strings

DACS II responds with a word strings in the denial message after a command is entered incorrectly or equipment is not operating properly. The following table provides the word string and the corrective action required to obtain command completion

| Word String                | Corrective Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INACT</b>               | The INACT message indicates that the command is invalid with the feature package being used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>BAD SYNTAX</b>          | <p>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, ?)</p> <p> <b>NOTE:</b><br/>The DACS II indicates where the input error occurred, by placing = signs around the word or portion in the echoed command.</p> |
| <b>ERR, ABT</b>            | 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                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MC OOS</b>              | The MC (main controller) must be restored to service to execute the command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>MCOND</b>               | The MC is in the maintenance condition, and only commands which are considered frame maintenance commands can be used                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MC INSERVICE</b>        | The MC must be in the maintenance condition to execute certain PMEM and SMEM commands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MPDBASE</b>             | The main processor data base is not loaded                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>RESTRICTED, STOPPED</b> | 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 SET-PRVG command with option RMON for the user                                                                                                                                                                                                                                                                                                                                                  |

## **Clear Command Denials (Continued)**

### **Subrate Denial Message**

The following table provides the corrective action required for a subrate data denial message string:

| <b>Message String</b>                          | <b>Corrective Action</b>                                                                                                                                                                                     |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exceeds Limit of 21                            | Only 21 MJUs can be disconnected at one time. Split the MJUs to be disconnected into smaller groups                                                                                                          |
| INCL Required for All Subrate Circuits         | This is a precaution to ensure that data customers are informed of maintenance action. Verify that you are addressing the correct channel and notify customers if you are going to remove service            |
| OLD Channel Not Established to Subrate Feature | The addressed channel has not been established to subrate with command established to subrate with CRTE-CRS-TS command                                                                                       |
| OLD Channel Has Associated Parity Channel      | The PCH [ppp] option must be used to indicate the next or particular parity channel                                                                                                                          |
| New Channel Not Same As Old                    | The new channel was established to Subrate differently (DS0A or DS0B). Check channel entries                                                                                                                 |
| Exceeds EC/SRM/MJU Capacity                    | For EC, use ECLOC query to find which is being used (SRM or MJU); enter command to change ECLOC. For SRM/MJU, the next plug-in is required for more capacity                                                 |
| MPTM Keyword Disallowed                        | The MPTB keyword is only valid for multipoint junction unit circuit                                                                                                                                          |
| MA Field Does Not Exist                        | The MJU entered in the MA field does not exist                                                                                                                                                               |
| ALL Keyword Is Not Specified                   | The ALL must be used when there are branches. Verify command entry                                                                                                                                           |
| Associated with RT Digroups                    | An NPC entered in the command is associated with <i>SLC</i> Carrier System; channels for these are entered as virtual channels on the DGA NPC, which allows channels 1 through 96 to be addressed on one NPC |

### **Common Causes**

Command denials can be categorized under common causes. The following table provides the denial descriptions and corrective action required to obtain command completion:

| <b>Command Denial</b>                          | <b>Corrective Action</b>                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input Error</b>                             | Check each field of the command entry on the screen or printout against the documented command to find the error                                                                                                                                                                                                                         |
| <b>Not Equipped, Not In-Service, or Failed</b> | The named equipment is not grown (equipped) or in-service to support the execution of the command. The commands to create 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.                                   |
| <b>Incorrect NPC/Channel Number</b>            | 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                                                                                         |
| <b>Invalid Parameters</b>                      | Check each field of the command entry against the documented command to determine which keyword is incorrectly used                                                                                                                                                                                                                      |
| <b>Boot Failed</b>                             | 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 |

---

## **Clear Command Denials (Continued)**

---

### **DENY Output Message**

The Deny output message provides a 4-digit error code which appears on a line by itself and the remaining lines which give the explanation of the error code. Table A-1 provides the error codes.

Error codes starting with the same letter are in the same general category; for example, I for input, E for equipage, S for service. The code is taken from letters of the key words that constitute the meaning of the code.

---

(Continued on next page)

**Table A-1. mmmm Condition Codes**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENEQ       | CCB not eqd, not IS, or failed or inactive side CCB not eqd or not IS<br>CPR is not equipped<br>Copy source NPC is not equipped<br>DSPI not equipped, not in service, or failed<br>DSPU is not equipped<br>Database corrupt<br>ETSI not equipped, not in service, or failed<br>FC not eqd, not IS, or failed or inactive side FC not eqd or not IS<br>FMT not eqd, not IS, or failed, or inact side FMT not eqd, or not IS<br>FTMI not equipped, not in service, or failed<br>MIU is not equipped<br>Mate NPC is not equipped<br>NPC not equipped<br>NPC not provisioned as DGA<br>NPCTG not grown<br>NPCTP is not grown<br>No CBTYPE NPC equipped<br>No DSP unit equipped<br>Not enough DSPPs are equipped<br>Protection MIU is not equipped<br>Protection entity is unequipped<br>Required FLI not equipped, not in service, or failed<br>Required MIU not equipped, not in service, or failed<br>Required MXR not equipped, not in service, or failed<br>SYNC TB is not equipped<br>Service MXR is not equipped<br>Subject entity is not equipped<br>Sync source NPC is not equipped<br>TSI not eqd, not IS, or failed or inactive side TSI not eqd or not IS<br>The MXR is not grown<br>The pair MXR is not equipped<br>Unit not equipped, not in service, or failed<br>Test group unequipped<br>Virtual SLC NPC not provisioned |
| ENFE       | Cross-connect not consistent with feature package<br>Software does not contain Enhanced CEPT feature<br>Subject NPC does not support CEPT BER feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ENIE       | Option rr/m has not been set up on 2nd database<br>Termination is not connected as indicated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ENRE       | Two confs. were prev. connected or the concat. cause BRD-BBL loop<br>Corresponding NPC for FROM virtual channel is not provisioned<br>Corresponding NPC for TO virtual channel is not provisioned<br>Corresponding NPC for virtual channel is not provisioned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | FROM NPC is not provisioned as DGA                                |
|            | Illegal connectivity specified                                    |
|            | NPC not provisioned for CAS                                       |
|            | NPC not provisioned for NSA                                       |
|            | PMEM type no longer supported                                     |
|            | SMEM is a normal SMEM                                             |
|            | SSC circuit pack is still equipped; pull-out/remove SSC           |
|            | Subject entity is equipped                                        |
|            | TO NPC is not provisioned as DGA                                  |
| ERLC       | Attempt to remove DGA w/o INCL keyword or prior prot. sw. request |
|            | Customer control or red circuit exists                            |
|            | DGA protected; use INCL to remove, or unswitch protection         |
| ICNV       | PM scheduling report is already allowed for this entity           |
|            | PM scheduling report is already inhibited for this entity         |
|            | TS0 is crossconnected to TS0                                      |
|            | Bit value not allowed for NPC type                                |
|            | Current error corrector pack type specified in command            |
|            | Current Hub id specified in command                               |
|            | not allowed for clear 2MB                                         |
| IDMS       | Both FAC and PRIM values(keywords) are required                   |
|            | INCL keyword needed to perform this command                       |
|            | INCL must be specified for SRDC ckts                              |
|            | SIDE must be specified for substrate NPC                          |
|            | Some priority values required                                     |
|            | Unspecified L2 address                                            |
| IDNC       | FDL selected with width not 1                                     |
|            | Inconsistent or invalid circuit type for Nx64Kbit TA              |
|            | Old or new is a non-channelized type in a DS0 command             |
|            | One NPC is a non-channelized type and the other is not            |
|            | Some priority values not required                                 |
|            | TG width incompatible with circuit                                |
|            | The two FADS entered are not associated with one another.         |
|            | Incompatible HUB feature types                                    |
|            | Inconsistent BCON width for test access                           |
|            | Inconsistent HUB width for specified TG                           |
|            | Invalid channel designation for BCON                              |
|            | Not all FROM channels on same NPC                                 |
| IDNV       | A locally switched channel is specified as BBL, LEG, or BRD       |
|            | A substrate circuit pack is specified in the command line         |
|            | AIS entered for MONE/MONF/MONEF/SPLTA/SPLTB/SPLTAB                |
|            | AIS invalid for cross-connection specified                        |
|            | AIS keyword incompatible with NPC type                            |
|            | Adding two digroups from one bank on same DDC                     |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                    |
|------------|-----------------------------------------------------------------------|
|            | Alarm option and bank mode don't match                                |
|            | All NPC(s) are either not valid or not grown                          |
|            | Attempt to broadcast a locally switched channel                       |
|            | Attempt to one way cross-connect a locally switched channel           |
|            | BER must not be less than 4 for Clear DS1                             |
|            | Bad PRIM X'efgh values                                                |
|            | Bank id number not found                                              |
|            | CPR circuit pack specified in the command                             |
|            | Can't Use LCN 0/LGN 0 - designated as a supervisory channel only      |
|            | Can't delete because not all associated NPCs of the RT are entered    |
|            | Command not allowed                                                   |
|            | Conference first channel doesn't match input                          |
|            | Conference port cannot be dropped out of conference by switch command |
|            | Conference port is not in conference circuit                          |
|            | Connectivity can not be specified for CEF unit                        |
|            | Counting sequence and operational mode don't match                    |
|            | Cross-connect a non Mode I channel to DCLU                            |
|            | Cross-connect a non SLC channel to DCLU                               |
|            | DGA and DGB must be specified together in the command                 |
|            | DGA with NDL option is not provisioned with D4 or ESF framing format  |
|            | DGA/DGP of RT/DL Mode I must be assigned to one DDC                   |
|            | DGC and DGD must be specified together in the command                 |
|            | DGP designated to bank without data link                              |
|            | Digroup name and bank id don't match                                  |
|            | Digroups from same bank are added to two different FTUs               |
|            | Digroups from same bank have different counting sequence              |
|            | Digroups from same bank have different modes                          |
|            | Duplicate L2 address                                                  |
|            | Duplicate ports specified                                             |
|            | ENQ/ACK flow control is supported only on Snider link                 |
|            | Error in input                                                        |
|            | Framing format, digroup name & operational mode don't match           |
|            | INCL not specified and at least one NPC In Service                    |
|            | IU type NPC(s) cannot be provisioned for Minor Alarm                  |
|            | IW option is not allowed for new type of Clear-DS1 NPC                |
|            | Inconsistent Signaling on CEPT NPCTGs                                 |
|            | Inconsistent channel range width                                      |
|            | Invalid CEPT NPC                                                      |
|            | Invalid CFT code                                                      |
|            | Invalid FPI value                                                     |
|            | Invalid FROM channel number                                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Invalid MIU/MXR type specified                                      |
|            | Invalid NPC addressing scheme specified                             |
|            | Invalid SLC Mode-III channel number                                 |
|            | Invalid TC specification                                            |
|            | Invalid TO channel number                                           |
|            | Invalid channel 000 cross-connection specified                      |
|            | Invalid channel 031 cross-connection specified                      |
|            | Invalid channel number                                              |
|            | Invalid circuit type                                                |
|            | Invalid keyword(s) combination specified                            |
|            | Invalid line number                                                 |
|            | Invalid link number specified                                       |
|            | Invalid poll time                                                   |
|            | Invalid switch request for DCLU                                     |
|            | Leg type mismatch                                                   |
|            | MUX or TRB invalid for cross-connection specified                   |
|            | Mode I RT/DL IDs don't match for DGA/DGP on same DDC                |
|            | NAM invalid for cross-connection specified                          |
|            | NDL option is specified for DGA                                     |
|            | NDL option is used without DGA                                      |
|            | NPC containing channel 000 is invalid type.                         |
|            | NPC is a DGP                                                        |
|            | NPC is channelized type                                             |
|            | NPC is not part of a one-way connection                             |
|            | NPC number and bank id don't match                                  |
|            | NPC number and digroup name don't match                             |
|            | NPC parameter only valid with TU type TLI                           |
|            | NPC type is not DS type                                             |
|            | NPC type option Y is invalid for SLC-96 NPC                         |
|            | NPC used as a timing reference                                      |
|            | NPC(s) actual type incompatible with TYPE keyword and/or alarm type |
|            | No OOS keyword is given for out-of-service NPC                      |
|            | No PM data available                                                |
|            | No mapped circuit under test; emode/fmode can't be changed.         |
|            | Number of transmitting ports does not match existing conference     |
|            | OLD and NEW Data and Parity channels partially overlap              |
|            | OLD and NEW channels cannot be the same                             |
|            | OLD data channel cannot be parity channel type                      |
|            | Old and new are the same NPC in a DS1 command                       |
|            | One-way circuit under test; emode can't be changed.                 |
|            | Operation mode and digroup name don't match                         |
|            | Option not programmable for this NPC type                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b>  | <i>Explanation</i>                                                     |
|-------------|------------------------------------------------------------------------|
|             | PWR/MISC alarm is specified to a digroup other than DGA                |
|             | Parameter only valid with PA, PB, or PC type NPCs                      |
|             | RT-DCLU cross-connect with different channel number                    |
|             | RT-DCLU cross-connect with different ids                               |
|             | RTF keyword and the operation mode does not match                      |
|             | RTF keyword is used without DGA                                        |
|             | Range entered without FRC keyword                                      |
|             | Range not allowed for circuit type                                     |
|             | SC invalid for cross-connection specified                              |
|             | Selectable AIS not valid for specified NPC(s) type                     |
|             | Side specified for non-duplicated NPC                                  |
|             | Signaling processing is not activated for the channel                  |
|             | Superuser logged on                                                    |
|             | TG East/West type inconsistent with each other or circuit              |
|             | TS0 specified with width not 1                                         |
|             | TS16 specified for CAS TG                                              |
|             | TS16 specified for test with width not 1                               |
|             | The RT id entered is not a retrofit one                                |
|             | The common bit(s) is(are) not set in both FAC & PRIM                   |
|             | The facility parameter not programmable for specified x or z parameter |
|             | The parameter specified does not match with the NPC type               |
|             | The specified parameter is not applicable to operation mode of the RT  |
|             | Trunk type is not allowed in the circuit specified                     |
|             | Unmatched channel range                                                |
|             | Unmatched channel range involving SLC Mode III termination             |
|             | Unrunnable CFT code                                                    |
|             | Using the 24th channel of a DMI NPC                                    |
|             | Using the 24th channel of a T1DM NPC                                   |
|             | Virtual circuit is not specified for X.25 link                         |
|             | XON/XOFF flow control is supported only on Snider link                 |
|             | ZBTSI option is only valid with the ESF mode                           |
|             | Emode/fmode can't be changed under current test mode.                  |
|             | x & z parameters on DSxyz are inconsistent                             |
| <b>IDRG</b> | Command did not execute for any entity specified in the command        |
|             | Ending channel is out of range                                         |
|             | First and Last NPCs are outside a module boundary                      |
|             | First and Last NPCs are outside unit boundary                          |
|             | Invalid FROM channel number range                                      |
|             | Invalid TO channel number range                                        |
|             | Invalid range for specified FROM NPC type                              |
|             | Invalid range for specified NPC type                                   |
|             | Invalid range for specified TO NPC type                                |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | NPC range crosses unit boundary                                      |
|            | OFFSET range is invalid                                              |
|            | Old and New channel on same NPC and within the range                 |
|            | Only up to 4 historical data registers are allowed                   |
|            | TG width too large for single NPCTG                                  |
|            | Threshold value is out of range                                      |
|            | Unit type (xyz) not supported                                        |
|            | input channel out of range (SLC not supported)                       |
| IICM       | Clear gateway test access disallowed.                                |
|            | SRDC timeslots are allocated on this NPC                             |
| IIDT       | AIS not entered for SPLTE/SPLTF/SPLTEF/LOOPE/LOOPF                   |
|            | Database conference width does not match the range in input command  |
|            | Illegal BBL BBL combination                                          |
|            | Illegal BBL SYM combination                                          |
|            | Illegal BRD BRD combination                                          |
|            | Illegal BRD SYM combination                                          |
|            | Illegal LEG LEG combination                                          |
|            | Illegal SYM BBL combination                                          |
|            | Illegal SYM BRD combination                                          |
|            | Invalid change from previous mode                                    |
|            | Invalid change parameter combinations                                |
|            | Invalid input BBL as fmd in ONE-WAY command                          |
|            | Invalid input BBL in terminated TWOWAY/ONEWAY command                |
|            | Invalid input BRD as tmd in ONE-WAY command                          |
|            | Invalid test mode for a one-way test session                         |
|            | Invalid test mode for an unmapped test session                       |
|            | Invalid use of CONV keyword                                          |
|            | NPC is a channelized NPC                                             |
|            | NPC is a non-channelized NPC                                         |
|            | NPC is not a F-end                                                   |
|            | NPC is not a Facility Access Digroup                                 |
|            | NPC is not an E-end                                                  |
|            | NPC type mismatch                                                    |
|            | No NPC's out of service and OOS keyword used                         |
|            | No RDLT or CUS circuits and INCL keyword used                        |
|            | Report interval is not an integral number of accumulation interval   |
|            | TO side is not a DMB type NPC                                        |
|            | This NPC type does not allow unframed Clear-DS1                      |
|            | Transmission parameters in command will not change existing settings |
|            | Trunk conditioning is invalid                                        |
| IIFM       | Bad FAC value entered                                                |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | Exceeded depth limit of 6 on broadcast conference concatenation   |
|            | FMC cannot be cross-connected in this format                      |
|            | Invalid FROM NPC type for AIS insertion                           |
|            | Invalid NPC type for AIS insertion                                |
|            | Invalid TO NPC type for AIS insertion                             |
|            | Try to operate a ONE-WAY conference with a TWO-WAY input command  |
|            | Try to operate a TWO-WAY conference with an ONE-WAY input command |
| IPNV       | Accumulation Interval field is missing                            |
|            | Accumulation Interval field is not allowed                        |
|            | FAC keyword is invalid for this feature                           |
|            | Historical data can not be specified                              |
|            | Interval is not valid/not available                               |
|            | Invalid direction specified for NTST TLA/TLR                      |
|            | Invalid parameter combination                                     |
|            | Invalid use of INCL keyword                                       |
|            | Level field is not allowed                                        |
|            | MONDAT keyword is invalid for this feature                        |
|            | MONDAT set to ALL is not allowed                                  |
|            | MONTIM set to ALL is not allowed                                  |
|            | Mismatch between channel 0 crossconnect and keywords              |
|            | Monitored Date field is not allowed                               |
|            | Monitored Time field is not allowed                               |
|            | NPC is non-channelized                                            |
|            | NPC number out of range                                           |
|            | No PM data available                                              |
|            | Only 15MIN for accumulation interval is allowed                   |
|            | Only DAILY for accumulation interval is allowed                   |
|            | Only historical data can be specified                             |
|            | Only one parameter is allowed                                     |
|            | PRIM keyword is invalid for this feature                          |
|            | Scheduled reporting for this npc is inhibited                     |
|            | Scheduling report could not be found                              |
|            | The MONDAT and MONTIM parameters can not both be specified        |
|            | This NPC type does not allow Payload                              |
| NCON       | No conditions                                                     |
| SAAL       | Feature is active                                                 |
|            | Manual Pending is Active                                          |
|            | PA NPC threshold already in allow mode                            |
|            | Protection switching is already allowed                           |
|            | The switch is allowed (not inhibited)                             |
| SAAS       | All channels assigned, cannot be grown as NPCTG                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Another NPC is grown and added as this digroup                      |
|            | BCON BBL has one or more legs under test                            |
|            | Channel(s) is already registered                                    |
|            | Channels assigned, cannot be grown as test group                    |
|            | Channels assigned, cannot be grown as test port                     |
|            | Conference Port is currently registered to a different channel      |
|            | New bank id is an assigned one                                      |
|            | TG number previously assigned                                       |
|            | Termination is already assigned                                     |
|            | Termination is in process of being rolled                           |
|            | The MIU is already equipped                                         |
|            | Channel already under test                                          |
|            | Channel part of a TP or TG                                          |
|            | Circuit contains mapped channels for HUB request                    |
| SAIN       | Loop back inhibited for digroup                                     |
|            | No mapped slots on a tsi                                            |
|            | No unmapped slots on a bus                                          |
|            | PA NPC threshold already in inhibit mode                            |
|            | Parity channel cannot be within the range of a DS0 command.         |
|            | Protection switching is already inhibited                           |
|            | Subject entity is pested                                            |
|            | Termination is under test or is a test port or group                |
|            | The switch is already inhibited                                     |
|            | Can't change option, inhibition is active                           |
| SAIS       | Both syncs are in-service                                           |
|            | CCN side s is in service                                            |
|            | CRO is still equipped                                               |
|            | Conference already exists                                           |
|            | DS3U NPC already In-Service                                         |
|            | DSPI is in service                                                  |
|            | MIU is already in service                                           |
|            | Mate NPC (DGA/DGP) is in service                                    |
|            | NPC not IU/TI type                                                  |
|            | Some TLIs are still equipped                                        |
|            | Some TSIs to degrow are in service                                  |
|            | Subject entity is in service                                        |
|            | TLI 3 or 4 still equipped                                           |
|            | Test group is not idle or frame is not In Service                   |
|            | Test port is not idle or frame is not inservice                     |
|            | The MMFG is already In-Service                                      |
|            | The MXR is in service                                               |
|            | The selected FLI is IS and Pested and at least 1 Service MXR is eqd |
| SAOP       | RT's alarm exists                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                             |
|------------|----------------------------------------------------------------|
| SAOS       | This signal is already being sent                              |
|            | A DMB on the Unit is OOS                                       |
|            | Both syncs are out-of-service                                  |
|            | CCB is out of service                                          |
|            | CCI is out of service                                          |
|            | CCN side s is out of service                                   |
|            | CCNI is out of service                                         |
|            | DSPI out-of-service                                            |
|            | ETSI is out of service                                         |
|            | FC out of service                                              |
|            | FLI is out of service                                          |
|            | FMT is out of service                                          |
|            | FTMI is out of service                                         |
|            | File has already been cleared                                  |
|            | Formatter (FMT) on active CCN side is Out-Of-Service           |
|            | IU/TI type NPC failed                                          |
|            | MIU is out of service                                          |
|            | MXR is out of service                                          |
|            | Mate CCN side is out of service                                |
|            | Mate SYNC is out of service                                    |
|            | NPC out of service or failed                                   |
|            | Protection MIU is out of service                               |
|            | Protection MXR is out of service                               |
|            | Protection entity out of service or failed                     |
|            | SYNC is out of service                                         |
|            | Service MIU is out of service                                  |
|            | Service MXR is out of service                                  |
|            | Subject entity is out of service                               |
|            | Sync 0 is not in-service                                       |
|            | Sync 1 is not in-service                                       |
|            | The MMFG is Out Of Service                                     |
|            | The mate FLI is OOS and Protection MIU is equipped             |
|            | The mate FLI is OOS and Protection MXR is IS                   |
|            | The mate FLI is OOS and at least one Service MXR is equipped   |
|            | The protection FLI is out of service or pested (TOPRTN option) |
|            | The selected MIU associated with the NPC is Out-Of-Service     |
|            | The selected MXR associated with the NPC is Out-Of-Service     |
|            | The service FLI is out of service or pested (TOSRVC option)    |
|            | UC is out of service                                           |
| SAPS       | Frame ID is protected                                          |
|            | The Service MMFG is already under protection                   |
|            | The protection FLI is already selected (TOPRTN option)         |
|            | Can't change option, protection switch is active               |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SAPV       | Option LOCAL already exists<br>Option REMOTE already exists                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SARB       | Exceeded limit of reports with accum. interval of 15 min. or less<br>Exceeded maximum limit of PM reports                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SARL       | No FADs were activated by link n<br>No test ports were activated by link n                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SATF       | Can't run test on active side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SAWS       | An autonomous switch is in progress<br>C-bit modify function is active<br>C-bit operations are enabled<br>Conference exists in a DMB<br>Mapped slots exist on a tsi<br>NPC already allocated as sync timing source<br>NPC already grown as non-synchronization source<br>NPC already has Equipment Loopback<br>NPC is already grown and added as SLC digroup<br>The Service MMFG is not under protection<br>The service FLI is already selected (TOSRVC option)                                                                        |
| SNAS       | Connectivity contains unequipped units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SNIS       | CPR is out of service<br>Cannot clear journals for OOS unit<br>DSPU unit controller is out of service<br>NPC is OOS for a TGR command and OOS keyword not specified<br>NPC unequipped, out of service or failed<br>RT/DL has unrestored DGA<br>Sync source NPC is not inservice<br>TD on one(both) sync(s) is not equipped or not in-service<br>Unit(s) OOS, and additional backup required                                                                                                                                            |
| SNOS       | In-service NPC change not allowed<br>Subject PWR to be cleared is not failed                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| SNVS       | (Timing Distributor) TLI is not equipped<br>1 hr >= 24 hr for DM opt<br>15 min >= 24 hr for ERS opt<br>15 min >= 24 hr for SERS opt<br>15 min >= 24 hr for SLIP opt<br>15 min >= 24 hr for US opt<br>3 Timing Distributor type TLIs are equipped<br>A DMB mode was assigned to a FTU-type NPC on the input<br>A loopback is active on the FROM termination<br>A loopback is active on the TO termination<br>A user is already logged in on the link/vc<br>Active CCN side is out of service<br>Adding DL DGP forbidden for SLC 96 MD 1 |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Alarm bits cannot be passed through or inverted                      |
|            | All digroups not out of service                                      |
|            | Another signal already active prevents this signal from being sent   |
|            | Assignment of single priority to multiple SSPs                       |
|            | At least one UC is OOS or At least one UC is failed                  |
|            | At least one UC is not the correct type                              |
|            | Attempt to add to a null transmitting port                           |
|            | Attempt to remove a Service MIU which is under protection            |
|            | Attention: preceding ccode 83 is an anomaly - see problem list       |
|            | Autonomous loopback is active on DGA                                 |
|            | Backup required before executing this command                        |
|            | Bad sync mode                                                        |
|            | Bad use of INCL, cannot override the current state of the conference |
|            | Bad use of INCL, cannot use keyword on conf.-to-conf. connection     |
|            | Bit 3 provisioned for use as RAI3                                    |
|            | Bit 4 provisioned for use as RAIS                                    |
|            | Bit 4 provisioned for use as RBER                                    |
|            | Bit 5 provisioned for use as SFI                                     |
|            | Bit c not settable                                                   |
|            | Bits 3 through 8 are provisioned for Transmic 1G                     |
|            | Boot in progress, can't service request                              |
|            | Both ITS TG bundles must be on same TG193B card                      |
|            | Both sides of CCN are OOS                                            |
|            | Broadcast unassigned channel/NPC in QRY,TO                           |
|            | C-bit modify function is disabled                                    |
|            | CATP due to skipping continuity test for FMT                         |
|            | CCB is inservice but failed                                          |
|            | CCI is inservice but failed                                          |
|            | CCI is not present                                                   |
|            | CCNI is inservice but failed                                         |
|            | CPR in buffer overflow condition                                     |
|            | CRO type TLI (SSP portion not required)                              |
|            | CUS flag doesn't match that of conference                            |
|            | Can not create any more users                                        |
|            | Can not execute privileged command                                   |
|            | Can not perform DMB CHG on input direction A                         |
|            | Can not perform DMB CHG on input direction B                         |
|            | Can not perform DMB CHG on input direction F                         |
|            | Can not perform DMB CHG on input direction G                         |
|            | Can not perform DMB CHG on input direction L                         |
|            | Can not perform DMB CHG on input direction T                         |
|            | Can not remove Frame administrator                                   |
|            | Can not remove own link                                              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Can not use 12-th TP when NPCTP is in the T1DM or DMI mode          |
|            | Can't disconnect return leg unless entire conference disconnected   |
|            | Can't mount or unmount BOTH_MEM                                     |
|            | Can't mount or unmount PMEM                                         |
|            | Can't mount or unmount SMEM                                         |
|            | Can't mount or unmount password recovery card                       |
|            | Can't perform DMB CHG because NTR flag set on FROM side             |
|            | Can't perform DMB CHG because NTR flag set on TO side               |
|            | Can't RST MC CLR when a unit is equipped                            |
|            | Can't start new session - previous session still verifying          |
|            | Change not valid                                                    |
|            | Change to T1DM digroup with cross-connect that is not TRSP          |
|            | Change to non-ESF digroup with 16-state cross-connect               |
|            | Channel has a FAR, which is within the range                        |
|            | Channel or NPC not bridged                                          |
|            | Channel out of bound in a BCON/v.c                                  |
|            | Channels and conference port do not match                           |
|            | Clock absent for XPC to loop back                                   |
|            | Combination of bit g (b7) and h (b8) is invalid                     |
|            | Command and protocol are inconsistent                               |
|            | Command invalid while backup in progress                            |
|            | Command is Frame administrator (DAX) only.                          |
|            | Conference Port is already registered to the same group of channels |
|            | Conference is LPD: has no switchable return leg                     |
|            | Conference is NTR: has no switchable return leg                     |
|            | Conference port is currently connected                              |
|            | Conference port is not registered                                   |
|            | Conversion leg is terminated                                        |
|            | Cross-connect to CPR is required                                    |
|            | Customer controlled circuit, INCL not entered                       |
|            | DB MP or units ram error                                            |
|            | DB retrofit fail                                                    |
|            | DCTN conference channel cannot be rolled                            |
|            | DGA is not added                                                    |
|            | DGN on subject entity denied                                        |
|            | DGP is protecting a primary digroup                                 |
|            | DL ffff is used w/ operational mode other than Mode I               |
|            | DMI combined with T1DM                                              |
|            | DSPP not in service, or failed                                      |
|            | DSPP pack FTMI Failed or Out of Service                             |
|            | DSPP pack NPC Failed or Out of Service                              |
|            | DSPP pack UC Failed or Out of Service                               |
|            | Database is empty                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                 |
|------------|----------------------------------------------------------------------------------------------------|
|            | Database is not empty                                                                              |
|            | Database not loaded                                                                                |
|            | Delete or change a leg from a conference that has no leg                                           |
|            | Deny Clear-2MB for Alternate Maps                                                                  |
|            | Deny SLC for Alternate maps                                                                        |
|            | Deny SP Type NPCs for Alternate Maps                                                               |
|            | Deny non-channelized NPCs for Alternate Maps                                                       |
|            | Designated TG or circuit to be tested in process of being rolled                                   |
|            | Different DSxyz types are used for DGA/DGP on same DDC for Mode I                                  |
|            | Digroup is protected                                                                               |
|            | Disable not allowed - supports another feature                                                     |
|            | ETSI cannot be initialized when ECCN side is OOS or inservice but<br>pested                        |
|            | ETSI is inservice but failed                                                                       |
|            | ETSI is not present                                                                                |
|            | Entity can't be addressed in this configuration                                                    |
|            | FC is inservice but failed                                                                         |
|            | FLI is inservice but failed                                                                        |
|            | FMT is in service but failed                                                                       |
|            | FPI on SMEM does not match one on PMEM                                                             |
|            | FRC specified for protection, and service MMFG is In Service                                       |
|            | FROM is a two-way and no CONV specified                                                            |
|            | FROM is not a backbone leg                                                                         |
|            | FTMI is PESTED                                                                                     |
|            | FTMI is in service but failed                                                                      |
|            | FTMI type error                                                                                    |
|            | Feature deactivation would leave system with core software                                         |
|            | Feature not enabled                                                                                |
|            | File already exists                                                                                |
|            | File doesn't exist/can't be accessed                                                               |
|            | File is being accessed                                                                             |
|            | File is empty                                                                                      |
|            | Firmware timing invalid for Transmic 1G NPC                                                        |
|            | Flash Card is bad                                                                                  |
|            | Flash Card is empty                                                                                |
|            | Flash Card is not present                                                                          |
|            | Frame is not in MCOND                                                                              |
|            | Frame time is not set                                                                              |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Automatic CRC-4                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Firmware Timing                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Transmic 1G, 2G<br>G1 SMEM for SMEM->PMEM w/journals |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                             |
|-------------|----------------------------------------------------------------|
|             | G4 to G4.1 retrofit failed                                     |
|             | Gateway test access not supported                              |
|             | Hardware mismatch or not present                               |
|             | INCL keyword needed when restricted Insertion Word specified   |
|             | IW is UMUX (18) but NPC not type DE4yz                         |
|             | IW not allowed to be specified in Clear 2Mbit/s                |
|             | Illegal SSP type (not same as other SSPs)                      |
|             | Illegal priority value                                         |
|             | Illegal test access mode for TS0                               |
|             | Illegal test access mode for TS16                              |
|             | Improper roll command sequence                                 |
|             | Inactive side NPC out of service and inactive side in service  |
|             | Incompatible types of NPCs on a circuit pack                   |
|             | Incorrect language/addressing mode                             |
|             | Incorrect number of parameters                                 |
|             | Incorrect or missing password                                  |
|             | Incorrect pack type in slot                                    |
|             | Initialization of application in progress, retry command later |
|             | Input BRD (BBL) has same NPC and channel as BBL (BRD)          |
|             | Insufficient data for setting up a conference                  |
|             | Integrated Test Set is currently active on TG                  |
|             | Invalid NPC number specified                                   |
|             | Invalid PWR/MISC alarm level                                   |
|             | Invalid combination of "x" and "y" values                      |
|             | Invalid combination of "x" and "z" values                      |
|             | Invalid executable on card                                     |
|             | Invalid option, mailbox or flag                                |
|             | ITS NPC Hardware Error                                         |
|             | ITS TG Already Generating                                      |
|             | ITS TG Already Monitoring                                      |
|             | ITS TG is Idle                                                 |
|             | ITS TG Not Generating                                          |
|             | ITS TG Not Monitoring                                          |
|             | LEG mode was assigned to a DSPU-type NPC on the input          |
|             | LLB not initiated                                              |
|             | LPD invalid since existing conference is not already LPD       |
|             | Language "F" provisioned for this channel                      |
|             | Language is not allowed                                        |
|             | Last link in service                                           |
|             | Line Loop Back is active                                       |
|             | Line format types are incompatible                             |
|             | Link being used is not Link 1                                  |
|             | Logical conflicts found in the map                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                      |
|------------|-------------------------------------------------------------------------|
|            | Looped Circuit Access not allowed                                       |
|            | MP database not consistent with Configuration file                      |
|            | Major/Minor BER threshold value is invalid for SLC NPCs                 |
|            | Maj Min BER threshold is 7, but not in T1DM or Fe mode                  |
|            | Map/macro file write deferred until backup is completed                 |
|            | Mapped parity channel(s) on new                                         |
|            | Mate RT/DL mode is different                                            |
|            | Mate sync pack denied command                                           |
|            | Maximum number of CPRs have already been grown for this unit            |
|            | Minor <= major for BER opt                                              |
|            | Minor >= major for COFA opt                                             |
|            | Minor >= major for SLIP opt                                             |
|            | Minor Slip threshold disabled before Major Slip threshold               |
|            | Mismatch between MXR and NPC types                                      |
|            | Mismatch between service MXR and protection MXR types                   |
|            | New NPC already cross-connected or mapped channel(s) exist on New       |
|            | NPC addressing scheme selected is not allowed in the configuration file |
|            | NPC as 12th test port can not change to DMI nor T1DM                    |
|            | NPC has active circuit                                                  |
|            | NPC has been designated as NPCTG                                        |
|            | NPC has been designated as NPCTP                                        |
|            | NPC invalid type                                                        |
|            | NPC is NPCTG and chan 24 is used in a TG; Can't change to T1DM or DMI   |
|            | NPC is NPCTG, changing to CAS/NSA is not allowed                        |
|            | NPC is a Facility Access Digroup                                        |
|            | NPC is a test port                                                      |
|            | NPC is not a NPCTG                                                      |
|            | NPC is not a NPCTP                                                      |
|            | NPC is not added                                                        |
|            | NPC is not designated for this NPCTP/NPCTG                              |
|            | NPC is still provisioned to provide sync timing                         |
|            | NPC not DA or TA type.                                                  |
|            | NPC not deleted                                                         |
|            | NPC not designated as sync timing source                                |
|            | NPC providing timing to inservice SSP                                   |
|            | NPC type error                                                          |
|            | NPC type is inconsistent with FTMI type                                 |
|            | NPC type option xyz is unassigned or invalid for feature package        |
|            | NTR invalid since existing conference is not already NTR                |
|            | New NPC same as existing one                                            |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | New in CGA or PBA                                                   |
|            | No CBTYPE NPC capacity remaining                                    |
|            | No DL digroups can be added until the associated RT bank is created |
|            | No Facility Line Interface (FLI) is In Service                      |
|            | No SAFE alarm for DGP                                               |
|            | No available timeslots on any inservice NPCS associated with FC/FMT |
|            | No edit session active                                              |
|            | No equalization for CEPT FTMI                                       |
|            | No macro is currently executing                                     |
|            | No mapped channel on old                                            |
|            | No protection switch is currently active                            |
|            | No signals active                                                   |
|            | No unmapped time slot                                               |
|            | No user is logged in on the link/vc                                 |
|            | No user/link needs to be changed                                    |
|            | No zeros allowed for DAX privilege                                  |
|            | Not Timing Extractor type TLI (not SSP)                             |
|            | Not a CRO TLI                                                       |
|            | Not a DACS II compatible Flash Card                                 |
|            | Not enough DSPPs are in service                                     |
|            | Not enough TSIs for CCB test                                        |
|            | Not first channel in a BCON/virtual conf                            |
|            | Not valid for frame administrator                                   |
|            | Number of DGPs on each unit is limited to 32                        |
|            | Number of SLC RT's on each unit is limited to 80                    |
|            | OLD termination is not mapped                                       |
|            | Obsolete circuit type                                               |
|            | Old and new channels have not been paired by a BCAST command.       |
|            | One of the FAR end channels is being rolled                         |
|            | One of the far NPC(s) is SLC                                        |
|            | One or more FADs could not be released                              |
|            | One or more test ports could not be released                        |
|            | One way unassigned channel/NPC in QRY,TO                            |
|            | Only one channel allowed to have this language                      |
|            | Option NOT leg can not appear with F, T, or B                       |
|            | Option NOT leg is not a FTU leg                                     |
|            | Option NOT leg is not in conference                                 |
|            | Other FLI is OOS                                                    |
|            | Other NPC on this DDC not the same digroup for Mode I DGA/DGP       |
|            | PDI Version number mismatch                                         |
|            | PMEM and SMEM are different                                         |
|            | PMEM and SMEM synchronization fail                                  |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | PMEM error, boot from SMEM                                        |
|            | PMEM not in service or not ready                                  |
|            | PMEM not restored                                                 |
|            | Parity channel out of bound on new                                |
|            | Password recovery card is not READ-only                           |
|            | Point number mismatch                                             |
|            | Priority values are same                                          |
|            | Problem occurred while accessing BOTH_MEM                         |
|            | Problem occurred while accessing PMEM                             |
|            | Problem occurred while accessing SMEM or unformatted SMEM         |
|            | Protection switch existing is autonomous                          |
|            | RCV continuity test won't be run: SYNC OOS or pested              |
|            | RCV continuity test won't be run: at least one timeslot in use    |
|            | RCV continuity test won't be run: no DMB timeslots available      |
|            | RCV continuity test won't be run: no available IS NPCS for FC/FMT |
|            | RDLD flag doesn't match that of conference                        |
|            | RTBC conference exists                                            |
|            | Range overlapping between FROM and TO or between two TOs          |
|            | Ranges of old and new do not match                                |
|            | Reading Feature Package Id from PMEM failed                       |
|            | Red circuit, INCL not entered                                     |
|            | Release number mismatch                                           |
|            | Report already exists                                             |
|            | SLC 96 MD 1 RT DGP requires mate NPC to be unequipped             |
|            | SMEM error, boot from PMEM                                        |
|            | SMEM is not present                                               |
|            | SMEM unit is not restored                                         |
|            | SR NPC was specified - not allowed                                |
|            | SSC Diagnostic Failure                                            |
|            | SSP number is illegal                                             |
|            | SSP number required                                               |
|            | SSP type(options) same                                            |
|            | SSP with 0 priority present                                       |
|            | SSP with non 0 priority present                                   |
|            | SYNC is inservice but failed                                      |
|            | Signaling state of the trunk failed for the channel               |
|            | Skip error summary since adjacent pack not in service or pested   |
|            | Software Identification Block failed comparison                   |
|            | Software Identification Block is not readable                     |
|            | Some associated NPCs are equipped                                 |
|            | Some circuits not activated,cleared or pictured                   |
|            | Source does not contain requested information                     |
|            | Specified width does not match existing conference width          |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                                  |
|-------------|---------------------------------------------------------------------|
|             | Stratum not allowed                                                 |
|             | Sync architecture different                                         |
|             | Sync architecture is same                                           |
|             | Sync mode is same                                                   |
|             | Sync stratum is same                                                |
|             | Syncs are equipped                                                  |
|             | System macro/map space is full                                      |
|             | T1DM or DMI mode and channel 24 is connected                        |
|             | TB type in hardware mismatches DB                                   |
|             | Termination is a test port                                          |
|             | Termination is protected (RDLD)                                     |
|             | Termination is under customer control (CUS)                         |
|             | Termination is under test                                           |
|             | Test ports must be on CAS                                           |
|             | Test session already exists                                         |
|             | Testport/testgroup channel cannot be rolled                         |
|             | TG in TSM ON mode                                                   |
|             | TG not in TSG ON mode                                               |
|             | TLA/TLR invalid with ITS test groups                                |
|             | TO is a part of the same conference as a previous TO                |
|             | TO is already the return leg                                        |
|             | TO is not a leg of this/any conference                              |
|             | TO is the backbone leg of a conference                              |
|             | TO side of two-way to be converted is not an FTU NPC                |
|             | The INCL keyword is needed for DGA                                  |
|             | The MMFG is protected                                               |
|             | The NDL options are different for DGA's on the same DDC for Mode I  |
|             | The NPC of VC BBL leg doesn't match that in the input command       |
|             | The NPC to delete has not been previously added to map              |
|             | The OLD or NEW NPC is already being rolled.                         |
|             | The associated MMFG is under protection (for Service MIUs)          |
|             | The associated MXR is In-Service but pested                         |
|             | The conference does not exist                                       |
|             | The first channel of VC BBL leg doesn't match that in the input cmd |
|             | The first channel of VC BRD leg doesn't match that in the input cmd |
|             | The input BRD leg is not in VC                                      |
|             | The map is not valid                                                |
|             | The mode of the RT is not applicable                                |
|             | The reference map does not exist                                    |
|             | The requested digroup is carrying service                           |
|             | The selected MIU associated with the NPC is In-Service but failed   |
|             | The selected MXR associated with the NPC is In-Service but failed   |
|             | The session is terminated due to maintenance operation              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                              |
|-------------|-----------------------------------------------------------------|
|             | The total number of receiving ports specified exceeds the max.  |
|             | There are no INS MXRs to run test on                            |
|             | Timeslot channel numbering not allowed with CAS                 |
|             | Timing Extractor type TLI (need SSP info)                       |
|             | Timing Extractor type TLIs are present                          |
|             | Transmic 1G NPC designated as SYNC source invalid               |
|             | Transmitting port cannot be dropped                             |
|             | Tried to disconnect a nonexisting VC                            |
|             | Trunk conditioning doesn't match that of conference             |
|             | Try to add a BBL to VC, but the VC already has backbone         |
|             | Try to delete a BBL leg from VC; however, VC has no BBL leg     |
|             | Try to delete a BRD leg from VC; however, VC has no BRD leg     |
|             | Trying to add a BBL leg to a conference set up as SYM           |
|             | Trying to add a BBL to a DMB conference that already has one    |
|             | Trying to add a SYM leg to conference set up as broadcast       |
|             | Trying to add a broadcast leg to a conference set up as SYM     |
|             | Trying to add or delete a leg when a conference is under test   |
|             | Trying to change in NTR direction                               |
|             | Trying to change level in on BBL leg                            |
|             | Trying to change level out on BRD leg                           |
|             | TS0 connected to nonTS0 in Mode 2 - "a" should be "-" or "b"    |
|             | Two digroups from same bank added to different FTMIIs           |
|             | UC is in service but failed                                     |
|             | Unable to verify Configuration file since MP DB not loaded      |
|             | Unassigned operational mode                                     |
|             | Unframed clear 2Mbit/s NPC invalid for Bit 4 used as RA IS/RBER |
|             | Unframed clear 2Mbit/s NPC invalid for TS0 processing           |
|             | Unit is not FTU type                                            |
|             | Unit type error                                                 |
|             | Unmapped channel(s) on old                                      |
|             | Unpestering error registers for subj. entity failed             |
|             | Use of this NPC is RESERVED for SLC 96 MD 1                     |
|             | User does not exist                                             |
|             | User has been created                                           |
|             | User has logged in somewhere                                    |
|             | User is not logged in                                           |
|             | User logged off during session                                  |
|             | User login-id is not DAX                                        |
|             | User macro/map space is full                                    |
|             | User quit the menu                                              |
|             | User still owns files                                           |
|             | Width of existing two way does not match conference width       |
|             | Write to CPR failed                                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Writing Feature Package Id to PMEM failed                            |
|            | Wrong SSP type(Timing Extractor type)                                |
|            | Wrong TLI type                                                       |
|            | Wrong TLI type (need CRO grow command)                               |
|            | X option is illegal                                                  |
|            | XMIT continuity test won't be run: CFT code specified                |
|            | XMIT continuity test won't be run: no XMIT timeslots available       |
|            | Y option is illegal                                                  |
|            | Z option is illegal                                                  |
|            | Channel is OCON in opposite direction                                |
|            | Circuit already terminated                                           |
|            | Circuit not terminated                                               |
|            | Hub id not set when MJU pack grown                                   |
|            | Invalid mode for TLA/TLR                                             |
|            | Invalid test access mode                                             |
| SOSF       | All CBTYP NPCs out of service or failed                              |
|            | DSPU unit controller is failed                                       |
| SPFA       | No protection is available for the Service MMFG                      |
|            | Protection switch process failed                                     |
| SPSW       | The Protection MMFG is selected, and auto. switchback is unavailable |
|            | The protection MMFG is serving another facility                      |
| SROF       | (NPC) Hardware mismatch                                              |
|            | BOOT on subject entity failed                                        |
|            | CCN denied request                                                   |
|            | Can't lock or unlock ram database                                    |
|            | Circuits TCONed itself cannot be UTST                                |
|            | DB can't get the slave mail box                                      |
|            | DB can't send or receive mail                                        |
|            | DGN on subject entity failed                                         |
|            | Failed to boot CI                                                    |
|            | Failed to boot CONF file                                             |
|            | Failed to boot DB                                                    |
|            | Failed to boot journal--recurrence indicates database corruption     |
|            | Failed to boot subject CCN side                                      |
|            | Failed to boot unit                                                  |
|            | Failed to switch SYNC side                                           |
|            | General boot failure (vanilla flavor)                                |
|            | IU/TI type NPC                                                       |
|            | MIU is failed                                                        |
|            | MXR is failed                                                        |
|            | Mismatch between MXR and MIU HDW types                               |
|            | NPC Failed or Out of Service                                         |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b>  | <i>Explanation</i>                                         |
|-------------|------------------------------------------------------------|
| <b>mmm</b>  | No Memory Backup Has Been Scheduled                        |
|             | None of the designated NPCTG(s) are equipped               |
|             | None of the designated TG(s) are equipped                  |
|             | PMEM verification failed                                   |
|             | Read/write eeprom error                                    |
|             | RST failed to boot DB                                      |
|             | RST failed to boot program                                 |
|             | SSC software out of date                                   |
|             | Sync not completely reset                                  |
|             | Sync pack denied command                                   |
|             | Syncs failed to cross couple                               |
|             | The MIU boot failed                                        |
|             | The MIU diagnostics failed                                 |
|             | The MXR boot failed                                        |
|             | The MXR diagnostics failed                                 |
|             | Unit 1 denied request                                      |
|             | Unit 2 denied request                                      |
|             | Unit 3 denied request                                      |
|             | Unit 4 denied request                                      |
|             | Unit 5 denied request                                      |
|             | Unit 6 denied request                                      |
|             | Wrong MXR type grown for this MIU                          |
| <b>SRTN</b> | Test Port release failed                                   |
|             | Test group release failed                                  |
| <b>SWFA</b> | Active CCN side not IS or failed or pested or hardware OOS |
|             | Boot TLI failed                                            |
|             | Checksums verification failed                              |
|             | DB PMEM error OP-CL-RD-WR-SK                               |
|             | DB SMEM error OP-CL-RD-WR-SK                               |
|             | DSPI failed                                                |
|             | Data link failed                                           |
|             | Device failed to format                                    |
|             | Device failed to initialize                                |
|             | Failed to lock sync to timing reference                    |
|             | Far end failed to respond                                  |
|             | Hardware database mismatch                                 |
|             | MXR LOS with unselected FLI                                |
|             | Selected FLI has LOC with at least one inservice MXR       |
|             | Sync is not configured yet                                 |
|             | Unselected FLI has LOS with at least one inservice MXR     |

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**DACS II**  
**Release 9.0, MML**  
**Operations and Maintenance**  
Volume III - Trouble Clearing

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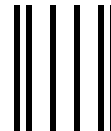
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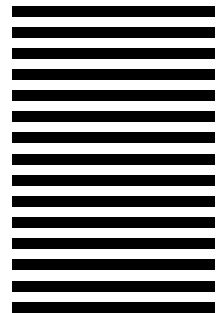
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## **Background**

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### **Purpose**

The purpose of this manual is to aid in acceptance and operation of the Digital Access and Cross-Connect System II (DACS II).

This document provides reference information required to support the craft personnel activities involved in the daily operation and maintenance of the DACS II. It also includes an overview that describes the physical and functional attributes of the DACS II.

---

### **Intended Audiences**

This document is for individuals who are responsible for the acceptance, provisioning, operation, and maintenance of the DACS II, Release 9.0.

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## New Features in This Release

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### Overview

The new features associated with DACS II Release 9.0 are:

- Threshold support for the Hybrid DS3 circuits
  - The introduction of the Intelligent Communication Interface (ICI) circuit pack.
  - Integrated Test Set (ITS).
- 

### Hybrid DS3 Threshold Support

This feature adds threshold support to the performance monitoring feature for Hybrid DS3 circuits. Users can set up four separate threshold values including the default threshold value for each performance monitoring parameter. When a threshold is crossed, a threshold crossing message is issued. However, with this feature, threshold crossings and their associated alarm messages can be suppressed (turned off).

---

### ICI Circuit Pack

The Intelligent Communication Interface (ICI) circuit pack (TM 782 card) provides the port connections for the seven administrative links:

- Four asynchronous links (links 1 through 4, SNIDER protocol)
- Two synchronous links (links 5 and 6, X.25 protocol)
- One TCP/IP link (link 7, telnet protocol).

The ICI circuit pack replaces the Main Controller's H/ECI circuit pack used prior to Release 9.0, and even plugs into the same slot used for the H/ECI circuit pack. The ICI pack will have all of the existing functionality of the H/ECI pack except the functionality available with the additional TCP/IP link connection.

---

### ITS

The Integrated Test Set (ITS) feature provides the DACS II with a built-in Bit Error Ratio Tester (BERT) capability. The ITS was developed to replace expensive test sets for facility troubleshooting, providing the capability of generating, reading, and evaluating test signals from the DACS II.

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### Non-CEF Information

Release 9.0 does not support Non-CEF frames. However, the Non-CEF information is left in the documentation for reference purposes.

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## How to Use This Manual

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### **Before Using the Procedures**

Before you attempt to use the procedures in this manual, you should become familiar with the contents of each volume.

---

### **Accessing the Information**

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

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

### **Prerequisites**

Before you use the procedures in this document, you should have completed the DACS II Operation and Maintenance course (TR3521 or TR3621).

If you were not able to take the training course, you should carefully study the information in Chapter 1 and the Command Denials located in Appendix A of Volumes I, II, and III.

---

### **Procedure Sequence**

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 the Trouble Identification section in Chapter 1 of Volume III. The sections in this volume 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.

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## Manual Contents

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### Volume Breakdown

This manual is divided into the following three volumes:

- Volume I - Operation and Maintenance Reference Material
- Volume II - Operation and Maintenance General Tasks
- Volume III - Trouble Clearing General Tasks.

The reference information in Volume I supports the General Tasks (procedures) documented in Volumes II and III.

---

### General Tasks and Supporting Elements

The chapters in Volume II and III are divided into General Tasks (GT) and Supporting Elements (SE). GTs are the major tasks performed by users, and SEs are sub-tasks within a GT.

There is a correspondence between the chapter numbers in Volume I and the GTs in Volume II. For example, the general tasks related to reference Chapter 6: Cross-connections and Disconnections begin at GT 6.1. In Volume III, the GTs for a particular type of trouble are grouped together in one chapter.

SEs are associated with a GT and are usually located immediately after the GT. Some SEs are reusable in other GTs in that particular chapter and in the GTs of other chapters. When a GT step requires an SE, the SE will typically be found at the end of the GT. GTs and SEs follow a similar numbering scheme. For example, *SE 5.1.1* indicates the first SE in GT 5.1.

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## Manual Contents (Continued)

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### Contents of Volume I

The contents of *Volume I - Operation and Maintenance Reference Material* are listed below:

■ **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 reference information which describes the acceptance of a DACS II frame after it has been installed.

■ **Chapter 3 - Provisioning**

This chapter contains reference information which describes circuit pack installation and the growing, restoring, removing, and degrowing of the common equipment (frame, synchronizer, and cross-connect network) and Units (FTU, DS3U, HDS3U, and DSPU).

■ **Chapter 4 - Test Access**

This chapter contains reference information which describes establishing test ports, making the DS0 and Clear-DS1 test connections, and establishing and testing subrate channels.

■ **Chapter 5 - Cross-Connections and Disconnections**

This chapter contains the reference information which describes making DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

■ **Chapter 6 - Administration**

This chapter contains the reference information which describes logging on/off the DACS II; creating, changing, and deleting alternate maps; and creating, activating, and deleting macros.

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## Manual Contents (Continued)

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### Contents of Volume I, Continued

#### ■ Chapter 7 - Maintenance

This chapter contains the reference information which describes routine PMEM and SMEM memory card maintenance, PMEM and SMEM card removal, and plug-in removal and replacement.

#### ■ Chapter 8 - Performance Monitoring

This chapter contains the reference information which describes scheduling and retrieving reports that monitor various DS1 performance parameters.

#### ■ Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume II

The contents of *Volume II - Operation and Maintenance General Tasks* are listed below:

- **Chapter 1 - (Left Intentionally Blank)**

- **Chapter 2 - Acceptance General Tasks**

This chapter contains the procedures to perform the acceptance of a DACS II frame after it has been installed.

- **Chapter 3 - Provisioning General Tasks**

This chapter contains the procedures to install circuit packs and to grow, restore, remove, and degrow the NPCs (FTU with or without *SLC*<sup>®</sup> Carrier, DS3U, HDS3U, and DSPU, Subrate, DMB, or DSP Applications).

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

- **Chapter 4 - Test Access General Tasks**

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

- **Chapter 5 - Cross-connections and Disconnections General Tasks**

This chapter contains the procedures to make DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

- **Chapter 6 - Administration General Tasks**

This chapter contains the procedures to make DS0, Clear-DS1, Channelized-DS1, and Subrate cross-connections and to disconnect the cross-connections.

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## **Manual Contents (Continued)**

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### **Contents of Volume II, Continued**

- **Chapter 7 - Maintenance General Tasks**

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

- **Chapter 8 - Performance Monitoring General Tasks**

This chapter contains the procedures to schedule and retrieve reports that monitor various DS1 performance parameters.

- **Appendix A - 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 procedures.

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## Manual Contents (Continued)

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### Contents of Volume III

The contents of *Volume III - Trouble Clearing General Tasks* are listed below:

- **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**

This chapter contains procedures for isolating 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**

This chapter contains procedures for isolating a conditional reset or back-up memory trouble.

- **Chapter 8 - Frame Audits**

This chapter contains procedures for isolating faults detected when frame audits are run.

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## **Manual Contents (Continued)**

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### **Contents of Volume III, Continued**

- **Chapter 9 - Software Error**

This chapter contains procedures for troubles indicated by a software trouble message.

- **Appendix A - Command Denials**

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

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## Manual Conventions

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**Special Font Used** This manual uses special fonts to differentiate computer input/output. The **constant width bold font** indicates message formats, keywords, letter representations of parameters, parameter values, and messages as they would appear on a DACS II terminal screen.

---

**Notes** Notes inform users of special considerations, situations, or items to remember. An example of a Note is shown below:

 **NOTE:**  
Terminated connection for DMB concatenation is not allowed.

---

**Safety Label** Cautions indicate the presence of a hazard that will or can cause a frame alarm or property damage if hazard is not avoided. An example of a Caution is shown below:

 **CAUTION:**  
*The UMC is inserted towards the direction that is terminated, potentially causing a loss of service.*

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## Related Documentation

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### Related DACS II Documents

The following documents support the DACS II:

- DACS II Installation Manual
  - IPH903 (DACS II CEF)
  - IPH903I (DACS II ESBF).

**Audience:** Customers planning to install the equipment

**Content:** Customer installation instructions.

- DACS II Release 7.0 Product Description Manuals:
  - 365-353-085 (24 Channel)
  - 365-353-086 (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 9.0 Operation and Maintenance Manuals:
  - 365-353-261 (PDS)
  - 365-353-271 (MML)
  - 365-353-281 (PDS 2.048-Mb/s Interface)
  - 365-353-291 (MML 2.048-Mb/s Interface).

**Audience:** End-user maintenance personnel

**Contents:** Procedures to operate and maintain the DACS II.

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- DACS II Release 9.0 Command and Message Manuals:

- 365-353-262 (PDS)
- 365-353-272 (MML)
- 365-353-282 (PDS 2.048-Mb/s Interface)
- 365-353-292 (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 9.0 Quick Reference Guides:

- 365-353-263 (PDS)
- 365-353-273 (MML)
- 365-353-283 (PDS 2.048-Mb/s)
- 365-353-293 (MML 2.048-Mb/s).

**Audience:** End-user maintenance personnel

**Content:** Abbreviated list of system commands and parameters.

- DACS II Release 9.0 Software Release Description:

- Comcode C108460080

**Audience:** End-user maintenance personnel

**Content:** Includes upgrade procedures for the new software release, status of problems fixed in previous releases, list of known problems, and operating issues for the specified software release.

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(Continued on next page)

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## Related Documentation (Continued)

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### Related DACS II Documents, Continued

- X.50/X.57 Subrate Application  
Release 1.0.3 for DACS II/Release 1.0.4 for DACS II ISX  
MML 2.048 Mbit/s Interface User's Manual

— 365-350-101 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the X.50/X.57 Subrate application on the DACS II or DACS II ISX. Commands and messages describing how to perform subrate cross-connects and subrate test access are included.

- DDS Subrate and MJU Application  
Release 1.0.4 for DACS II/Release 1.0.5 for DACS II ISX  
User's Manual

— 365-350-110 (PDS)

— 365-350-111 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DDS Subrate and MJU application on the DACS II or DACS II ISX. Commands and messages describing how to perform DDS subrate cross-connects, subrate test access, and subrate MJU operations are included.

- Digital Multipoint Bridge (DMB)  
DSP Platform Application  
Release 1.0.2 for DACS II/Release 1.0.3 for DACS II ISX  
User's Manual

— 365-353-144 (PDS)

— 365-353-154 (MML).

**Audience:** End-user maintenance personnel

**Content:** Complete manual describing how to install and operate the DMB application on the DACS II or DACS II ISX. Commands and messages describing how to perform DMB cross-connects and DMB test access operations are included.

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# **Trouble Identification**

## **General Tasks**

# **1**

---

### **Contents**

|                                                              |                          |
|--------------------------------------------------------------|--------------------------|
| ■ Select Trouble-Clearing Procedure                          | GT <a href="#">1.1-1</a> |
| ■ Isolate Frame Troubles                                     | GT <a href="#">1.2-1</a> |
| ■ Check REPT ALM IDLD or INFO Message                        | GT <a href="#">1.3-1</a> |
| ■ Check Autonomous Action or Command<br>In-Progress Messages | GT <a href="#">1.4-1</a> |
| ■ Check SC Information Messages                              | GT <a href="#">1.5-1</a> |

---



---

## Select Trouble-Clearing Procedure

# 1.1

---

### When to Use

Use this procedure if you are looking for a procedure to direct you through the evaluation of troubles in the trouble printout.

---

### Instructions

---

1. The actions involved with isolating and clearing troubles are typically performed as illustrated in the flowchart in Figure 1.1-1.
2. If you are looking for a summary of trouble types and indications so that you can isolate the trouble yourself, refer to Table 1.1-1 to find the appropriate chapter in this volume. This path should be used if you have some experience with the DACS II and you know the priority of handling multiple trouble messages.

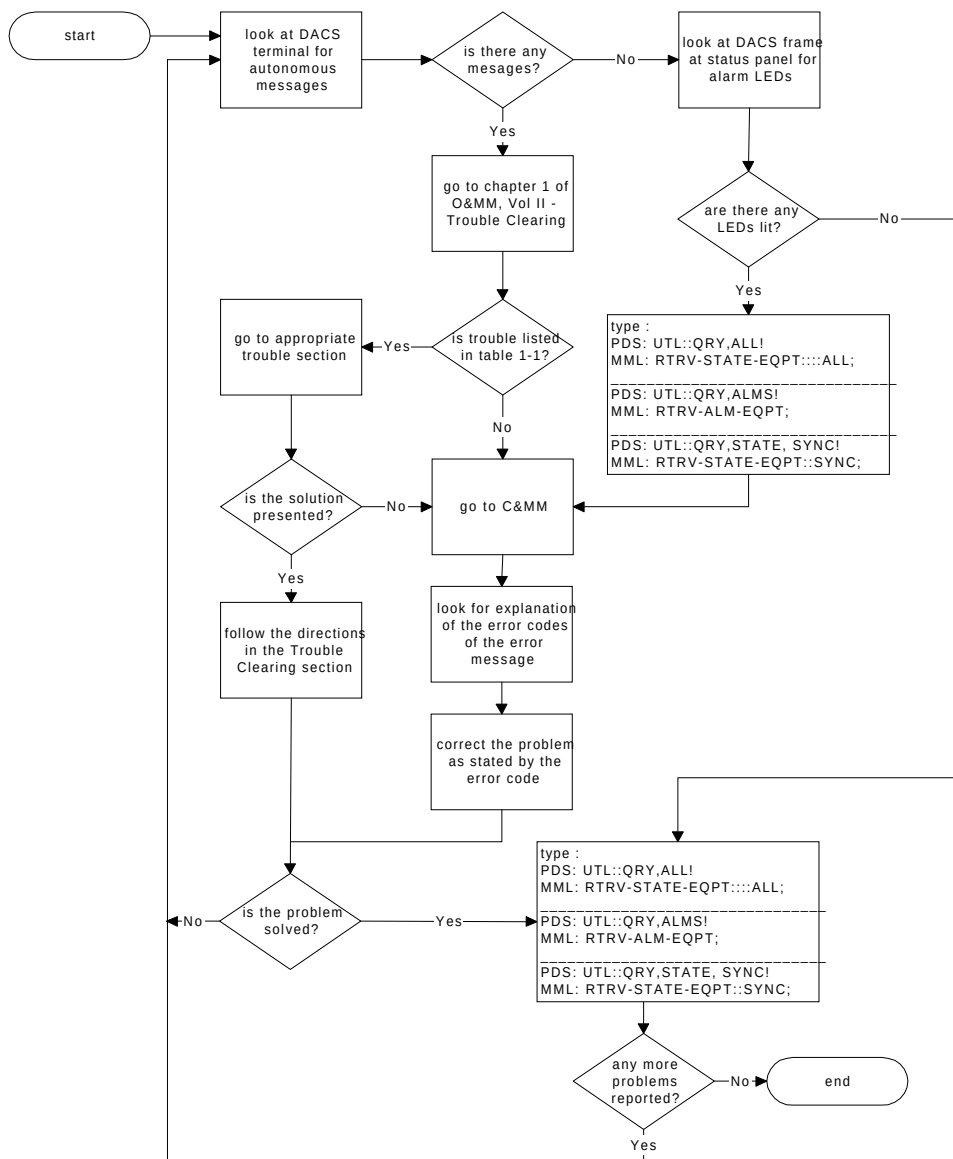


Figure 1.1-1. Trouble Clearing Flowchart

**Table 1.1-1. Trouble Summary and Chapter References**

| <b>Trouble Indication/<br/>Trouble Messages</b>                          | <b>Consequence Action</b>                                                              | <b>Trouble Cause</b>                                                  | <b>Trouble<br/>Section</b> |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------|
| Fuse bead extended (48V fuse & alarm panel)<br>LED lighted on fuse board | Plug-ins removed from service                                                          | Blown fuse: (1) Aged fuse failed, (2) Shorted backplane or plug-in.   | 2.1                        |
| PWR:TN-X-dddd,ERR                                                        | Major alarm: backup supplies the load<br>Critical alarm: plug-ins removed from service | (1) Power unit failed,<br>(2) Short on load                           | 2.2                        |
| ALM T3 ...DS3 {LOS BER OOF} COMPL                                        | Service interruption; AIS sent.                                                        | DS3 line failure                                                      | 3.1                        |
| AR01,MISC ALM ...MJ, CGA                                                 | Service interruption; trunk conditioning                                               | (1) Failed DS1 line, (2) Transmit/receive plug-in                     | 3.3                        |
| ALM ...<npc>:{MJ MN}, <parameter>                                        | Service interruption (with MJ alarm); trunk conditioning                               | (1) Line degradation,<br>(2) Transmit-end equipment                   | 3.5                        |
| ALM ...<npc>:{15ME 24HR} <parameter>                                     | Transmission impaired                                                                  | (1) Line degradation,<br>(2) Transmit equipment                       | 3.5                        |
| REPT EVT <entity> ESR<br>ANALYSIS REPORT ESR<br>REPT RMV EQPT            | Plug-in service removed; service switched to other side or protection                  | (1) Failed plug-in, (2) Wiring problem                                | 4.2                        |
| REPT EVT <entity> ERR<br>RMV <entity> DENY                               | Critical alarm: service interruption                                                   | (1) Multiple DS3 plug-ins failed, (2) Protection switching inhibited. | 4.3                        |
| ALM EQPT ...<side> OOS                                                   | Side failed; no duplex switching                                                       | Failed plug-in                                                        | 4.1                        |
| RTRV-ALM-EQPT; (input)                                                   | Frame alarm                                                                            | Power failed, plug-in failed, CCN/ECCN plug-in removed, etc.          | 1.2                        |
| DGN <entity> STF                                                         | 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                        |
| RESET-STOPPED                                                            | Frame controller inoperative                                                           | (1) Incorrect MC plug-in code, (2) Failed plug-in                     | 6.2                        |

| <b>Trouble Indication/<br/>Trouble Messages</b> | <b>Consequence Action</b>                                  | <b>Trouble Cause</b>                                                                                         | <b>Trouble Section</b> |
|-------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------|
| 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                    |
| {MP CI},OVERLOAD                                | Frame controller can't process commands; reset operated.   | Failed controller plug-in                                                                                    | 6.5                    |
| UNIT-qg UC, OVERLOAD                            | Unit controller can't process commands; UC restored.       | Failed controller plug-in                                                                                    | 6.5                    |
| CP MEM ...DENY                                  | Backup transfer failed; SMEM will not be current           | (1) Tape problem, (2) Frame controller trouble                                                               | 7.1                    |
| MC:RESET (COND cc) COMPLD                       | Frame controller inoperative or in MCOND                   | (1) Can't access PMEM/SMEM, (2) Failed plug-in                                                               | 7.2                    |
| DGNDDET Message O.82002                         | Frame audit messages                                       | Equipage/provisioning disagreement in memories.                                                              | 8.1                    |
| DGNDDET Message O.82001                         | Plug-in removed from service                               | Failed plug-in                                                                                               | 8.2                    |
| DGNDDET Message O.82003                         | 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                    |

---

**When to Use**      Use this General Task to isolate frame troubles.

---

### **Instructions**

---

To isolate frame troubles, follow these steps.

1. If alarm cutoff is needed, enter **OPR-ACO-ALL**. 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 GT 2.1 to clear blown fuse trouble.
3. Check printout for ERR PWR message.

- If ERR PWR message occurs in printout, go to GT 2.2 to clear power unit failure.
4. Enter **RTRV-ALM-EQPT : [xy] : : [ww]** ; 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 DS1 terminations are indicated by an M (major), \* (minor), I (INFO for type PB/PC NPC), or dash (no alarm) for the NPC.
  - DS3 facility alarms are indicated by a C\* (critical) in the UTL QRY ALMS DS3DS3 Alarm portion of the printout; dashes mean no alarms.
  - DS1 alarms (embedded in DS3) are indicated by an M (major) in the UTL QRY ALMS DS3U NPCSNPC-xxxx, MXR r of Unit portion of the printout.
  - Figure 1.2-1 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**.



"ALMS:a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s"

|   |   |                                    |
|---|---|------------------------------------|
| 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                             |
| t | = | Link 7                             |
| 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 1.2-1. Common Equipment Alarms**

5. Check printout for any of the messages in Table 1.2-1.
  - If you have any of the messages in Table 1.2-1, go to the reference listed for the message.

**Table 1.2-1. Facility Alarm Messages**

| Message Keywords                                      | Reference |
|-------------------------------------------------------|-----------|
| REPT ALM T3 -UNIT-qq;DS3-c:{AIS/BER/LOS/OOF}          | GT 3.1    |
| REPT ALM EQPT -AR01 MISC ALM MJ,CGA (DS1)             | GT 3.3    |
| REPT ALM EQPT -AR01 MISC ALM MJ,CGA (DS1 in DS3)      | GT 3.2    |
| REPT ALM AR01 -AR01 MISC ALM MJ,PBA (2.048 Mb/s line) | GT 3.4    |
| REPT ALM EQPT -<npc No.>:{MJ/MN},<parameter>          | GT 3.5    |
| REPT ALM T3 -UNIT qq;DS3-c::IDLD                      | GT 1.3    |
| REPT ALM EQPT -AR01 MISC ALM IDID CGA,IDLD            | GT 1.3    |

6. Check the printout for an ERR ESR ANALYSIS REPORT message. See Figure 1.2-2 for the typical sequence of messages.
  - If you have the ERR ESR ANALYSIS REPORT message, go to GT 4.2 to clear that message.

```

A ff REPT EVT EQPT
  "<entity>,TN-X-dddd,EVENT-eeee,ESR,ERR"
  "<error data bytes>"

A ff REPT ALMDET EQPT
  /* [0.01391] */
  "ANALYSIS, REPORT,EVENT-eeee,ESR,ERR"
  "<action>,<suspect plug-in No.1>"
  "<action>,<suspect plug-in No.2>"
  "<action>,<suspect plug-in No.3>"
  "<action>,<suspect plug-in No.4>"

A ff REPT RMV EQPT
  /* [0.33xxx] */
  "<entity>:<state>"

A ff REPT DGNDDET EQPT
  /* [0.41xxx] */
  "<entity>:{ATP|CATP-cc|STF-ppqq},<data bytes>"

```

**Figure 1.2-2. Error Analysis Report**

7. Check the printout for REPT RMV EQPT and REPT DGNDDET EQPT sequence of messages.
  - If you have the RMV and DGN sequence of messages, go to GT 4.3 to clear the ERR <entity> message.
8. Enter **RTRV-STATE-EQPT : [UNIT - [q]q] : ALL**; 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.

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 1.2-3.
10. If any circuits are out-of-service but not failed, enter the RST command per Figure 1.2-3.

**verb:[xy]:<CP identification>:[ww]{} or {}:<additional info.>}**

|               |                               |           |   |                                 |
|---------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::   | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::   | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT::  | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT:: } | CCI-s;                        | s         | = | side 0 or 1                     |
|               | CCNI-s;                       | s         | = | side 0 or 1                     |
|               | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|               | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|               | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|               | ETSI-S,ECCN-s;                |           |   |                                 |
|               | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|               | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = | module interface 1-4            |
|               | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|               | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|               | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|               | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|               | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|               |                               | INCL      | = | removes/restores MXR NPCs       |
|               | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|               | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|               |                               | s         | = | SIDE for DSPU                   |
|               | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::    | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

---

**Figure 1.2-3. Maintenance Command Construction**

11. Check printout for any messages that start with an A (for autonomous) or I (information) prefix.

- If you have an REPT EVT EQPT "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 1.2-1 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:
- ```
RTRV-ALM-EQPT;
RTRV-STATE-EQPT::[UNIT-[q]q]::ALL;
RTRV-STATE-COM:::ALL;
```

- If any CPs have failed status, enter the RMV command, replace the plug-in, and enter the RST command per Figure 1.2-2.
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:

```
RTRV-LOG:[xy]::[ww]:ERR:HWER,{INT-mn|
[DATE-mm-dd-yy,]TOD-hh-mm-ss}];
```

Suspect Entity:

```
RTRV-LOG:[xy]::[ww]: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, CI, CRO, PMEM, DMB, DSPI, EBX, EMTC, ETSI, FC, FTMI, LINK, MC, MP, MTC, NPC, DDC, FLI, FMT, MIU, MJU, MXR, SRM, 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 1.2-2 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 GT 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 ICI (Intelligent Communication Interface) 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 ...COMPLD (with no error explanations) message is received, this procedure is completed. Reconnect the administrative links.
  - If conditional completion is received, go to GT 7.2 to clear reset conditional completion.

**Table 1.2-2. Autonomous Messages**

| <b>Autonomous Message</b>                                                                       | <b>Reference</b> |
|-------------------------------------------------------------------------------------------------|------------------|
| ALM IDLD <parameter> NPC <npc No.> COMPL<br><parameter> = BER, SLIP, or other facility error    | GT 1.3           |
| ALM IDLD ECCN s OOS COMPL                                                                       | GT 1.3           |
| ALM MJ ECCN s OOS COMPL                                                                         | GT 4.1           |
| ALM MN SMEM COMPL                                                                               | GT 7.1           |
| ALM RESET {DATE/TOD/TOD DATE} ...COMPL                                                          | GT 6.3           |
| ALM [LOS/LEN/EXJ/PHS/OOF/MAJ/MIN] CLR ...COND Eccc COMPL                                        | GT 1.3           |
| ALM [LOS/LEN/EXJ/PHS/OOF/MAJ/MIN] SET ...COND Eccc COMPL                                        | GT 4.3           |
| ALM {15ME/24HR} <parameter> NPC <npc No.> COMPL                                                 | GT 3.5           |
| ALM {MJ/MN} <parameter> NPC <npc No.> COMPL<br><parameter> = BER, SLIP, or other facility error | GT 3.5           |
| AR01 MISC ALM IDLD {CGA/PBA} <npc No.> <alarm type> COMPL                                       | GT 1.3           |
| AR01 MISC ALM MJ CGA <npc No.> {A/B/F/L/M/R/X/Y/V} COMPL                                        | GT 3.3           |
| AR01 MISC ALM {PMA/DMA/MI} PBA <npc No.> <alarm type> COMPL                                     | GT 3.4           |
| {BADVERB/FRMERR/SEQERR} BAD SYNTAX ...STOPPED                                                   | GT 10.1          |
| BMTR ...DNY                                                                                     | GT 7.1           |
| BOOT FAILED - BAD BOOT DEVICE                                                                   | GT 6.4           |
| ICI RESET                                                                                       | GT 1.4           |
| ICI STARTUP STF                                                                                 | GT 6.2           |
| CMD MC {OOS/MCOND/INSERVICE/MPDBASE} ...STOPPED                                                 | GT 10.1          |
| DGN <entity> IN PROGRESS                                                                        | GT 1.4           |
| DGN CCB sq STF ppqq COMPL                                                                       | GT 5.21          |
| DGN CCI s STF ppqq COMPL                                                                        | GT 5.13          |
| DGN CCNI STF ppqq COMPL                                                                         | GT 5.13          |

| <b>Autonomous Message</b>                    | <b>Reference</b> |
|----------------------------------------------|------------------|
| DGN ICI STF ppqq COMPL                       | GT 5.3           |
| DGN PMEM STF ppqq COMPL                      | GT 5.4           |
| DGN ETSI sqq STF ppqq COMPL                  | GT 5.14          |
| DGN LINK a STF ppqq COMPL                    | GT 5.18          |
| DGN MC STF ppqq COMPL                        | GT 5.1           |
| DGN MP STF ppqq COMPL                        | GT 5.2           |
| DGN SYNC STF ppqq COMPL                      | GT 5.5           |
| DGN SYNC a,TLI m STF ppqq COMPL              | GT 5.7           |
| DGN SYNC,TLI 3,CRO STF ppqq COMPL            | GT 5.6           |
| DGN TSI STF ppqq COMPL                       | GT 5.13          |
| DGN SMEM STF ppqq COMPL                      | GT 5.16          |
| DGN UNIT qq,DSPI STF ppqq COMPL              | GT 5.10          |
| DGN UNIT qq,FC sb STF ppqq COMPL             | GT 5.11          |
| DGN UNIT qq,FLI s STF ppqq COMPL             | GT 5.18          |
| DGN UNIT qq,FMT s STF ppqq COMPL             | GT 5.19          |
| DGN UNIT qq,FTMI d STF ppqq COMPL            | GT 5.9           |
| DGN UNIT qq,MXR c STF ppqq COMPL             | GT 5.18          |
| DGN UNIT qq,UC STF ppqq COMPL                | GT 5.8           |
| EBX STARTUP STF                              | GT 6.2           |
| EMTC STARTUP STF                             | GT 6.2           |
| ERR ANALYSIS REPORT ...COMPL                 | GT 4.2           |
| ERR CMD ABT ...STOPPED                       | GT 10.1          |
| ERR ESR CCI s TN dddd EVENT eeee ...COMPL    | GT 4.3           |
| ERR ESR ETSI sqq TN dddd EVENT eeee ...COMPL | GT 4.3           |
| ERR ESR LINK a TN dddd STATUS a0 a1 a2 COMPL | GT 4.3           |
| ERR ESR MC ICI TN dddd EVENT eeee ...COMPL   | GT 4.3           |



| Autonomous Message                                                    | Reference |
|-----------------------------------------------------------------------|-----------|
| ERR ESR MC EBX TN dddd EVENT eeee ...COMPL                            | GT 4.3    |
| ERR ESR MC EMTC TN dddd EVENT eeee ...COMPL                           | GT 4.3    |
| ERR ESR MC MP TN dddd EVENT eeee ...COMPL                             | GT 4.3    |
| ERR ESR MC SSC TN dddd EVENT eeee ...COMPL                            | GT 4.3    |
| ERR ESR NPC <npc No.>[-<range>] SIDE s TN dddd<br>EVENT eeee ...COMPL | GT 4.3    |
| ERR ESR NPC <npc No.>[-<range>] TN dddd EVENT eeee ...COMPL           | GT 4.3    |
| ERR ESR SYNC a TLI m SSP b TN dddd EVENT eeee ...COMPL                | GT 4.3    |
| ERR ESR SYNC a TN dddd EVENT eeee ...COMPL                            | GT 4.3    |
| ERR ESR UNIT qq DSPI TN dddd EVENT eeee ...COMPL                      | GT 4.3    |
| ERR ESR UNIT qq FC sb TN dddd EVENT eeee ...COMPL                     | GT 4.3    |
| ERR ESR UNIT qq FLI k TN dddd EVENT eeee ...COMPL                     | GT 4.3    |
| ERR ESR UNIT qq FMT s TN dddd EVENT eeee ...COMPL                     | GT 4.3    |
| ERR ESR UNIT qq FTMI b TN dddd EVENT eeee ...COMPL                    | GT 4.3    |
| ERR ESR UNIT qq MIU c TN dddd EVENT eeee ...COMPL                     | GT 4.3    |
| ERR ESR UNIT qq MXR c TN dddd EVENT eeee ...COMPL                     | GT 4.3    |
| ERR ESR UNIT qq {UC/UBX} TN dddd EVENT eeee ...COMPL                  | GT 4.3    |
| ERR HARDWARE ....COMPL                                                | GT 4.8    |
| ERR MSGS TO LOG DISCARDED COMPL                                       | GT 4.6    |
| ERR PWR ...COMPL                                                      | GT 2.2    |
| ERR SOFTWARE ...COMPL                                                 | GT 9.1    |
| ERR SYNC a MODE {FAST/HOLDOVER/NORMAL} ...COND<br>Eccc COMPL          | GT 4.3    |
| ERR SYNC a TLI m SSP b [NPC <npc No.>]                                | GT 4.3    |
| FRADTS <nnpqq> CYCLE STARTED                                          | GT 1.4    |
| FRADTS BMCMP ...COMPL                                                 | GT 8.3    |
| FRADTS DGN ...COMPL                                                   | GT 8.2    |
| FRADTS FRCMP ...COMPL                                                 | GT 8.1    |

| <b>Autonomous Message</b>                               | <b>Reference</b> |
|---------------------------------------------------------|------------------|
| FRADTS MC DGN tttt COMPL                                | GT 8.2           |
| MC RESET ...COND cc COMPL                               | GT 7.2           |
| RMV <entity> COMPL                                      | GT 4.5           |
| MP STARTUP STF                                          | GT 6.2           |
| MTC STARTUP STF                                         | GT 6.2           |
| OVERLOAD {MP/ICI/UNIT qq UC} ...COMPL                   | GT 6.5           |
| RESET {DATE/TOD/TOD DATE} ...COMPL                      | GT 6.3           |
| RESET STOPPED                                           | GT 6.2           |
| RL (After Each Entry)                                   | GT 6.7           |
| SC ALM MJ CGA ...COMPL                                  | GT 3.7           |
| SC ALM MN {CGA/INH/MSW/PSW/DLF} ...COMPL                | GT 3.8           |
| SC ALM {CR/IDLD} DPLX ...COMPL                          | GT 1.5           |
| SC ALM COMP MN RT ...COMPL                              | GT 3.9           |
| SC ALM COMP IDLD RT ...COMPL                            | GT 1.5           |
| SC ALM {MJ/MN/IDLD} {MC/UC/PWR/FTMI/DSP}                | GT 1.5           |
| SC ALM MN {MISC/PWR/EEPROM/RGF} ...COMPL                | GT 3.11          |
| UTL RCY <entity> <action> COND cc COMPL                 | GT 1.4           |
| UTL RCY <entity> <action> COND cc DNY                   | GT 9.1           |
| UTL RCY IN PROGRESS                                     | GT 1.4           |
| <b>Autonomous Message<br/>(Numerical Order)</b>         | <b>Reference</b> |
| [O.01101]                                               |                  |
| M {BADVERB/FRMERR/SEQERR/CMD}:::[ww]:BAD-SYNTAX STOPPED | GT 10.1          |
| [O.01111]                                               |                  |
| M CMD::MC:[ww]:{OOS/MCOND/INSERVICE/MPDBASE} STOPPED    | GT 10.1          |
| [O.01121]                                               |                  |

| <b>Autonomous Message<br/>(Numerical Order)</b>                                                          | <b>Reference</b> |
|----------------------------------------------------------------------------------------------------------|------------------|
| A ff REPT EVT EQPT "CMD:ERR,ABT[,TN-X-abcd]"<br>[O.01131.01]                                             | GT 10.1          |
| M [<error field>/<act verb>]::[ww]:[<category>,<reason><br>{STOPPED DENY}<br>{STOPPED DENY}<br>[O.01201] | GT 10.1          |
| ** ff REPT ALM EQPT<br>"{CI/ICI}:RESET"<br>[O.01211]                                                     | GT 1.4           |
| A ff REPT DGN EQPT<br>"{CI/ICI}:STARTUP,{STF}"<br>[O.01221]                                              | GT 6.2           |
| A ff REPT DGN EQPT<br>"MP:STARTUP,{STF}"<br>[O.01241]                                                    | GT 6.2           |
| A ff REPT EVT EQPT<br>"BOOT:FROM-{PMEM/SMEM}"<br>[O.01241.01]                                            | GT 1.4           |
| A ff REPT EVT EQPT<br>"BOOT:IN_PROGRESS"<br>[O.01251]                                                    | GT 1.4           |
| A ff REPT EVT EQPT<br>":RESET-STOPPED"<br>[O.01261]                                                      | GT 6.2           |
| A ff REPT EVT EQPT<br>"MC:RESET-COMPLD,DACSII:gg,pp,r,kkttuuvv"<br>[O.01271]                             | GT 1.4           |
| BX {STF}<br>[O.01272]                                                                                    | GT 6.2           |
| EBX STARTUP {STF}                                                                                        | GT 6.2           |

| <b>Autonomous Message<br/>(Numerical Order)</b>                                                                                                   | <b>Reference</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| [O.01281]<br>MTC {STF}                                                                                                                            | GT 6.2           |
| [O.01282]<br>EMTC STARTUP {STF}                                                                                                                   | GT 6.2           |
| [O.01291]<br>A ff REPT INVID SFW                                                                                                                  | GT 6.2           |
| [O.01301]<br>A ff REPT EVT EQPT<br>"PWR:TN-X-dddd,ERR"                                                                                            | GT 2.2           |
| [O.01311]<br>A ff REPT EVT EQPT<br>"MC:[MP],TN-X-dddd[,EVENT-eeee][,ESR],ERR"                                                                     | GT 4.3           |
| [O.01311]<br>A ff REPT EVT EQPT<br>"MC:[EMTC],TN-X-dddd[,EVENT-eeee][,ESR],ERR"                                                                   | GT 4.3           |
| [O.01312]<br>A ff REPT EVT EQPT<br>"MC:[{MP/CI/SSC}],TN-X-dddd[,ESR],ERR"                                                                         | GT 4.3           |
| [O.01321]<br>A ff REPT EVT EQPT<br>"LINK-a:TN-X-dddd,ERR"<br>"STATUS:a0,a1,a2"                                                                    | GT 4.3           |
| [O.01331]<br>A ff REPT EVT EQPT<br>"SYNC-a:TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                        | GT 4.3           |
| [O.01333]<br>A ff REPT EVT EQPT<br>"SYNC-a:TLI-m,SSP-b[,NPC-abc],TN-X-dddd,ERR"<br>/* ALARM SET */<br>"[LOS][,LEN][,EXJ][,PHS][,OOF][,MAJ][,MIN]" | GT 4.3           |

| Autonomous Message<br>(Numerical Order)                                                                                                             | Reference |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| [O.01335]<br>A ff REPT EVT EQPT<br>"SYNC-a:TLI-m,SSP-b[,NPC-abc],TN-X-dddd,ERR"<br>/* ALARM CLEAR */<br>"[LOS][,LEN][,EXJ][,PHS][,OOF][,MAJ][,MIN]" | GT 4.3    |
| [O.01341]<br>A ff REPT EVT EQPT<br>"SYNC-a:TLI-m,SSP-b,TN-X-dddd[,NPC-[s]abc],EVENT-eeee[,ESR],ERR"                                                 | GT 4.3    |
| [O.01342]<br>A ff REPT EVT EQPT<br>"SYNC-a:TLI-m,TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                    | GT 4.3    |
| [O.01351]<br>A ff REPT EVT EQPT<br>"CCB-sf:TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                          | GT 4.3    |
| [O.01352]<br>A ff REPT EVT EQPT<br>"CCNI-s:TN-X-dddd,EVENT-eeee,ESR,ERR"                                                                            | GT 4.3    |
| [O.01353]<br>A ff REPT EVT EQPT<br>"TSI-sft:TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                         | GT 4.3    |
| [O.01354]<br>A ff REPT EVT EQPT<br>"CCI-s:TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                           | GT 4.3    |
| [O.01355]<br>A ff REPT EVT EQPT<br>"ETSI-sqq:TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                        | GT 4.3    |
| [O.01361]<br>A ff REPT EVT EQPT<br>"UNIT-qq:{UC/UBX},TN-X-dddd,EVENT-eeee[,ESR],ERR"                                                                | GT 4.3    |
| [O.01362]                                                                                                                                           |           |

| <b>Autonomous Message<br/>(Numerical Order)</b>                                           | <b>Reference</b> |
|-------------------------------------------------------------------------------------------|------------------|
| A ff REPT EVT EQPT<br>"ERR-SOFTWARE"<br>[O.01363]                                         | GT 11.1          |
| A ff REPT EVT EQPT<br>"UNIT-qq:FTMI-b,TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01364]        | GT 4.3           |
| A ff REPT EVT EQPT<br>"UNIT-qq:FC-sb,TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01366]         | GT 4.3           |
| A ff REPT EVT EQPT<br>"SYNC-a,MODE-{FAST/HOLDOVER/NORMAL/MATE}[TLI-m,SSP-c],<br>[O.01371] | GT 4.3           |
| A ff REPT EVT EQPT<br>"NPC-:SIDE-s,TN-X-dddd,EVENT-eeee [,ESR],ERR"<br>[O.01372]          | GT 4.3           |
| A ff REPT EVT EQPT<br>"NPC-:TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01381]                  | GT 4.3           |
| A ff REPT EVT EQPT<br>"{UNIT-qq,UC/MC[,CI/MP]}",OVERLOAD"<br>[O.01391]                    | GT 6.5           |
| A ff REPT ALMDDET EQPT<br>"ANALYSIS,REPORT,EVENT-eeee,ESR,ERR"<br>[O.01392]               | GT 4.2           |
| A ff REPT ALMDDET EQPT<br>"<circuit ID>:TN-dddd,ERR,HARDWARE"<br>[O.01393]                | GT 4.8           |
| A ff REPT EVT EQPT<br>":RESET,{DATE/TOD/DATE,TOD}"<br>[O.01401]                           | GT 6.3           |

| <b>Autonomous Message<br/>(Numerical Order)</b>                                                             | <b>Reference</b> |
|-------------------------------------------------------------------------------------------------------------|------------------|
| A ff REPT EVT EQPT<br>"UNIT-qq-FLI-k:TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01402]                           | GT 4.3           |
| A ff REPT EVT EQPT<br>"UNIT-qq-FMT-s:TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01403]                           | GT 4.3           |
| A ff REPT EVT EQPT<br>"UNIT-qq-MXR-c[-DEV-<devc>]:TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.01404]              | GT 4.3           |
| A ff REPT EVT EQPT<br>"UNIT-qq-MIU-c:TN-X-dddd,EVENT-eeee[,ESR],ERR"<br>[O.33xxx]                           | GT 4.3           |
| A ff REPT EVT EQPT<br>"<entity>:<state>"<br>[O.41004]                                                       | GT 1.4           |
| M DGN EQPT::<entity>:[ww] IN_PROGRESS<br>[O.55703]                                                          | GT 1.4           |
| M <verb>[ <modifier>][ <modifier>]:::[ww] IN_PROGRESS<br>[O.58011]                                          | GT 1.4           |
| A ff REPT EVT EQPT<br>"MC:MCOND"<br>[O.65011]                                                               | GT 7             |
| pa ff REPT ALM EQPT<br>"AR01,MISC ALM"<br>"<npc No.>:{MJ/MN/INFO},CGA,{A/B/F/L/M/R/V/X/Y}"<br>[O.65011]     | GT 3.3           |
| pa ff REPT ALM EQPT<br>"AR01,MISC ALM"<br>"<npc No.>:{PMA/DMA/MI},PBA,{A/B/E/I/L/M/R/S/V/X/Y}"<br>[O.65021] | GT 3.4           |

| <b>Autonomous Message<br/>(Numerical Order)</b>                                              | <b>Reference</b> |
|----------------------------------------------------------------------------------------------|------------------|
| A ff REPT ALM EQPT<br>"AR01,MISC ALM"<br>"<npc No.>:IDL,{CGA/PBA},<alarm type>"<br>[O.65031] | GT 1.3           |
| pa ff REPT ALM EQPT<br>"<npc No.>:{MJ/MN},<parameter>"<br>[O.65035]                          | GT 3.5           |
| pa ff REPT ALM EQPT<br>"<npc No.>,{15ME/24HR},<parameter>"<br>[O.65041]                      | GT 3.5           |
| A ff REPT ALM EQPT<br>"<npc No.>:IDL,{parameter}"<br>[O.65045]                               | GT 1.3           |
| A ff REPT ALM EQPT<br>"<npc No.>:IDL,{15ME/24HR},<parameter>"<br>[O.65051]                   | GT 1.3           |
| pa ff REPT ALM EQPT<br>"ALM,RESET,{DATE/TOD/DATE,TOD}"<br>[O.65053]                          | GT 6.3           |
| ** ff REPT ALM EQPT<br>"BOOT FAILED:BAD BOOT DEVICE"<br>[O.65054]                            | GT 6.4           |
| ** ff REPT ALM EQPT<br>"s:OOS"<br>[O.65055]                                                  | GT 4.1           |
| pa ff REPT ALM EQPT<br>"s:{MJ IDL}:OOS"<br>[O.65056]                                         | GT 4.1           |
| pa ff REPT ALM EQPT<br>"BMTR:SMEM:{MN/IDL}"                                                  | GT 7.1           |



| Autonomous Message<br>(Numerical Order)                                                                                                  | Reference |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| [O.65071]<br>A ff REPT OPR ACO ALL                                                                                                       | GT 1.4    |
| [O.65131]<br>pa ff REPT ALM EQPT<br>"SC,ALARM"                                                                                           | GT 3.3    |
| "RT/DL}-ffff,{DGA/DGB/DGC/DGD/DGP}-{s}abc:{MJ/MN}, \<br>{CLF/NE/FE}[,,{CGA/INH/PSW/MSW/DLF}][,k]"                                        |           |
| [O.65131]<br>pa ff REPT ALM<br>"SC,ALARM"<br>"{RT/DL}-ffff,{DGA/DGB/DGC/DGD/DGP}-uv-m-np:IDLD \<br>[,,{CGA/INH/PSW/MSW/DLF}][,k]"        | GT 1.3    |
| [O.65141]<br>pa ff REPT ALM<br>"SC,ALARM"<br>"{RT/DL}-ffff:[<alarm type>,<state>[,FE]"                                                   | GT 3.10   |
| [O.65151]<br>A ff REPT ALM EQPT<br>"SC,DPLX ALARM"<br>"{SYNC-a/CCI-s/ETSI-sqq/FC-sb-UNIT-qq/FMT-s-UNIT-qq/<br>NPC--SIDE-s}:{CR/IDLD},NE" | GT 1.5    |
| [O.65161]<br>A ff REPT ALM<br>"SC,ALARM"<br>"{MC/UC qq/PWR DDD/FTMI qqb/DSPI qq}:<state>,NE"                                             | GT 3.11   |
| [O.65171]<br>A ff REPT ALM EQPT<br>"SC,ALARM"<br>"RT-ffff:COMP,<state>[,INDX][,LBRV][,AB][,CD][,P][,ALP]"                                | GT 3.9    |
| [O.66001]                                                                                                                                |           |

| <b>Autonomous Message<br/>(Numerical Order)</b>                     | <b>Reference</b> |
|---------------------------------------------------------------------|------------------|
| pa ff REPT ALM T3<br>"UNIT-qq:DS3-c:<state>"<br>[O.66011]           | GT 3.1           |
| A ff REPT ALM T3<br>"UNIT-qq:DS3-c:<state>:IDLD"<br>[O.82001]       | GT 1.3           |
| A ff REPT DGNDDET EQPT<br>"ttt:eeee[-DEV-devc],d0"<br>[O.82002]     | GT 8.3           |
| A ff REPT DGNDDET EQPT<br>"ttt:d5,d4,d3,d2,d1,d0"<br>[O.82003]      | GT 8.1           |
| A ff REPT DGNDDET EQPT<br>"tt:d8,d7,d6,d5,d4,d3,d2,d1"<br>[O.82004] | GT 8.2           |
| A ff REPT AUD EQPT<br>"MC:ttt"<br>[O.82005]                         | GT 8.3           |
| A ff REPT EVT EQPT<br>"FRAME:AUD,nnppqq"                            | GT 1.4           |

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## Check REPT ALM IDLD or INFO Message

# 1.3

---

### When to Use

Use this General Task to deal 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 CGA (carrier group 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.

---

### Instructions

---

To check alarms or information messages, do the following.

1. Which one of the following keywords appears in the message?
  - If **IDLD**, continue with Step 2.
  - If **INFO**, proceed to Step 6.
2. This message reports that an alarm has cleared. For facility alarms, the NPC or DS3 position in the unit and the type of alarm are given in the message; for example, CGA (carrier group alarm), PBA (primary block alarm), and facility parameter BER (bit error rate).
3. If the message is the CGA type, refer to Table 1.3-1 for the meaning of the alarm type given at the end of the IDLD message.

**Table 1.3-1. CGA Alarm Types**

| Indicator | Meaning                                                     |
|-----------|-------------------------------------------------------------|
| C         | Combination of RAI and A16                                  |
| A         | Alarm Indication Signal                                     |
| B         | Both red and yellow<br>(not registered with TG80/TG80B NPC) |
| F         | Frame format error rate (TG180 NPC)                         |
| L         | Local multiframe alarm (DMI equipment)                      |
| M         | Remote multiframe alarm (DMI equipment)                     |
| R         | Red; incoming line failure                                  |
| V         | Line format violation (TG180 NPC)                           |
| X         | Multiple alarms (TG180 NPC)                                 |
| Y         | Yellow; outgoing line failure                               |

4. If the message is for a timing link failure (ERR SYNC messages) or for a DS3 line failure, refer to Table 1.3-2 for the meaning of the alarm type.
5. If the message is the PBA type for a 2.048-Mb/s line, refer to Table 1.3-3 for the meaning of the alarm type given at the end of the IDLD message.

**Table 1.3-2. 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 1.3-3. 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);<br>loss of frame primary block failure (LOF PBF). [Note 2] |
| R         | Incoming signal failure (PBF).                                                                             |
| 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.

6. An "A" after the CGA word and NPC number reports the receipt of an AIS (alarm indication signal, all 1s, blue signal) from the far end.
7. Consider the following situations in which the far end will send an all 1s signal:
  - On a DS1 facility connecting to multiplexers, the all 1s signal originates at the alarmed terminal (red) in the failed span and is forwarded along the route to prevent multiple red alarms that would hinder troubleshooting.
  - The far-end NPC can be grown to send an all 1s signal when it is removed from service.



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## Check Autonomous Action or Command In-Progress Messages

# 1.4

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### When to Use

Use this General Task to check autonomous action or command-in-progress messages.

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### Instruction

---

To check check autonomous action or command-in-progress messages, do the following:

**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 1.4-1 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/ICI RESET.

## Message Explanations

| Message Keywords                   | Explanation                                                                                                                      |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| DGN EQPT <entity> IN PROGRESS      | Autonomous or manually requested diagnostic is being run.                                                                        |
| RMV EQPT <entity> IN PROGRESS      | Autonomous or manually requested remove from service is being executed; this operation takes up to 3 minutes for the tape drive. |
| ACO State -Active                  | Alarm cutoff has been activated using the status panel control.                                                                  |
| REPT EVT ...FRAME:AUD              | Frame audit routine was autonomously initiated to compare values stored in different memory locations.                           |
| REPT RECOVY EQPT                   | Autonomous trouble recovery action is being executed.                                                                            |
| REPT ALM ...{CI   ECI   ICI} RESET | Notification to operation systems on links that the 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 DGNDDET Message No. O.82002, go to GT 8.1.
  - If DGNDDET Message No. O.82001, go to GT 8.2.
  - If DGNDDET Message No. O.82003, go to GT 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: **RTRV-ALM-EQPT**; and **RTRV-STATE-EQPT:::ALL**; and refer to the appropriate part (listed in order of importance) as follows:
    - If ERR ESR message, go to GT 4.3.
    - If FAILURE lighted on status panel, go to GT 6.1.
    - If retry later (RL) responses, go to GT 6.7.
    - If ERR SOFTWARE message, go to GT 9.1.
    - If frame alarm, go to GT 1.2.
    - If failed or out-of-service plug-ins, go to GT 2.1, 4.2, or 4.3.
    - If other trouble message, find the message in Table 1.2-2 at the end of GT 1.2 and go to that reference.
-



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**When to Use**

Use this General Task to check SC Information messages.

---

**Instruction**

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To check autonomous action of command-in-progress messages, do the following:

1. See Table 1.5-1 for an explanation of the message keywords and consider the following about the SC (SLC Carrier System) messages:

- These messages are issued to inform the personnel at operations centers of DACS II troubles which may interrupt operations. Other messages are used by the DACS II technicians to clear the trouble. The SC information messages are:

**SC, DPLX ALARM ...<state>, NE**

**SC, ALARM {MC|UC-qq|PWR-hhh|FTMI-qqb|DSPI}:<state>, NE**

- The NE keyword indicates that the trouble is at the near end (in the DACS II).
- The possibilities for the <state> field are: CR, MJ, MN, IDLD. These are for critical alarm, major alarm, minor alarm, and for message idled. When IDLD is received, the trouble has cleared and capabilities are restored.

**Table 1.5-1. Keyword Explanation**

| <b>Keyword</b>    | <b>Explanation</b>                                                                                                                                   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| MC                | Main controller failure. Customer service will not be affected, but DACS II message processing may be interrupted.                                   |
| UC qq             | Unit controller failure. Customer service will not will not be affected, but unit commands may be denied.                                            |
| FTMI qqb/<br>DSPI | Unit interface failure. Customer service will not be affected, but unit commands may be denied.                                                      |
| PWR hhh           | Power unit failed. A single power unit failure does not affect service because there is redundant power. Hexadecimal digits identify the power unit. |
| DPLX <entity>     | Both sides of a duplicated entity have failed. Customer service will be interrupted. The entity named in the message is the last side that failed.   |

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## Power Failures

## General Tasks

# 2

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### Contents

- Clear Blown Fuse Trouble GT [2.1-1](#)
  - Clear Power Unit Trouble GT [2.2-1](#)
  - Recover From Loss of Input Power GT [2.3-1](#)
-



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### When to Use

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.

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### Instructions

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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.*

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.

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 2.1-1 to Table 2.1-4 for the CEF
  - Table 2.1-5 for the non-CEF multibay frame
  - Table 2.1-6 for the single-bay frame.
- 5. Replace fuses.
- 6. If the fuse holds, verify that power unit output voltage is within limits (see Note 1) per Table 2.1-7 using a digital multimeter (such as KS-20599).

The FTU and DS3U 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.

After the wiring trouble is corrected, you will have to use the commands of Figure 2.1-1 to restore all plug-ins that were removed from service (see trouble printout).



**Table 2.1-1. 48-Volt Power (CEF) Feed A Fuse**

| 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, ETSIs                   | 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, DS3U, or HDS3U).

**Table 2.1-2. 48-Volt Power (CEF) - Feed B Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 2.1-3. 48-Volt Power (CEF) - Feed C Fuse**

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

**Note:** The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 2.1-4. 48-Volt Power (CEF) - Feed D Fuse**

| 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,<br>424AA, or 563A | Unit 8 (0PU)  | 70D,5A   | Green      |
| D13         | 411AA,SM566,<br>424AA, or 563A | Unit 9 (1PU)  | 70D,5A   | Green      |
| D14         | 411AA,SM566,<br>424AA, or 563A | Unit 10 (1PU) | 70D,5A   | Green      |
| D15         | 411AA,SM566,<br>424AA, or 563A | Unit 12 (1PU) | 70D,5A   | Green      |
| D16         | 411AA,SM566,<br>424AA, or 563A | Unit 13       | 70D,5A   | Green      |
| D17         | 411AA,SM566,<br>424AA, or 563A | Unit 14 (1PU) | 70D,5A   | Green      |
| D18         | 411AA,SM566,<br>424AA, or 563A | Unit 15 (1PU) | 70D,5A   | Green      |
| D19         | 411AA,SM566,<br>424AA, or 563A | Unit 16 (1PU) | 70d,5A   | Green      |

**Note:** . The type depends on the type of unit (IFTU, DSPU, DS3U, or HDS3U).

**Table 2.1-5. 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 | -             | (Indicating Fuse for A5-2) | 70G,.5A | Red        |
| A5-2 | 485AB         | PU1 (CCN 0)                | 70D,5A  | Green      |
| A6-1 | -             | (Indicating Fuse for A6-2) | 70G,.5A | Red        |
| A6-2 | 485AB         | PU2 (CCN 0)                | 70D,5A  | Green      |
| 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 | -             | (Indicating Fuse for B5-2) | 70G,.5A | Red        |
| B5-2 | 485AB         | PU3 (CCN 0)                | 70D,5A  | Green      |
| B6-1 | -             | (Indicating Fuse for B6-2) | 70G,.5A | Red        |
| 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      |

**Table 2.1-5. Multibay Power (Non-CEF) (Continued)**

| Fuse  | Power Unit/CP                          |                               |         |            |
|-------|----------------------------------------|-------------------------------|---------|------------|
|       | Type                                   | Designation/Location          | Size    | Bead Color |
| B9    | 411AA                                  | 0PU (UNIT 6)                  | 70D,5A  | Green      |
| C1    | 411AA                                  | 128-048<br>(Unit 1)           | 70D,5A  | Green      |
| C2    | 411AA                                  | 128-148<br>(Unit 2)           | 70D,5A  | Green      |
| C3    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 328-048*<br>(Unit 3)          | 70D,5A  | Green      |
| C4    | 411AA*,<br>424AA,<br>SM566, or<br>563A | 328-148*<br>(Unit 4)          | 70D,5A  | Green      |
| C5-1  | -                                      | (Indicating Fuse<br>for C5-2) | 70G,.5A | Red        |
| C5-2, | 485AB                                  | PU5 (1CCN)                    | 70D,5A  | Green      |
| C6-1  | -                                      | (Indicating Fuse<br>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*,<br>424AA,<br>411AA, or<br>563A | DCP6*<br>(Unit 6)             | 70D,5A  | Green      |
| D1    | 411AA                                  | 128-064<br>(Unit 1)           | 70D,5A  | Green      |
| D2    | 411AA                                  | 128-160<br>(Unit 2)           | 70D,5A  | Green      |
| D3    | 411AA*,<br>424AA,                      | 328-064*                      | 70D,5A  | Green      |

**Table 2.1-5. Multibay Power (Non-CEF) (Continued)**

| Fuse | Power Unit/CP     |                               |         |            |
|------|-------------------|-------------------------------|---------|------------|
|      | Type              | Designation/Location          | Size    | Bead Color |
| D4   | SM566, or<br>563A | (Unit 3)                      |         |            |
|      | 411AA*,<br>424AA, | 326-160*                      | 70D,5A  | Green      |
| D5-1 | SM566, or<br>563A | (Unit 4)                      |         |            |
|      | -                 | (Indicating Fuse<br>for D5-2) | 70G,.5A | Red        |
| D5-2 | 485AB             | PU7 (1CCN)                    | 70D,5A  | Green      |

**Table 2.1-6. 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             |

7. If the fuse holds, verify that power unit output voltage is within limits (see Note 1) per Table 2.1-7 using a digital multimeter (such as KS-20599).



**Table 2.1-7. Power Unit Requirements**

|                        |                                      | <b>Meter Connections</b> |                      |
|------------------------|--------------------------------------|--------------------------|----------------------|
| <b>Power Unit Code</b> | <b>Output Requirement (DC Volts)</b> | <b>Positive Lead</b>     | <b>Negative Lead</b> |
| SM565                  | +11.75 to +12.25                     | +V2                      | RTN                  |
|                        | –11.75 to –12.25                     | –V2                      | 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                         | +                        | –                    |

8. Refer to the appropriate table(s) that follows and the trouble printout to see the associated packs.
- Table 2.1-8 for controller and sync fuses (CEF)
  - Table 2.1-9 for controller and sync fuses (non-CEF)
  - Table 2.1-10 for IFTU fuses
  - Table 2.1-11 for DSPU fuses (flexible bay)
  - Table 2.1-12 for DSPU fuses (original interface bay)
  - Table 2.1-13 for DS3U fuses
  - Table 2.1-14 for CCN fuses (original interface bay)
  - Table 2.1-15 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).

9. Use RMV-EQPT commands per Figure 2.1-1 to remove any affected packs from service that were not removed as part of error recover RMV ...COMPLD in printout).

**NOTE:** Removing the NPC is service affecting.

### Figure 2.1-1. 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 2.1-1.
  - 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-EQPT commands per Figure 2.1-1 to restore affected packs (RMV ...COMPLD in printout). The commands are listed according to the hierarchy of the packs in the frame.
  - If the CCI cannot be restored, enter **STA-LOCL-RST : :PMEM**; and, after the boot completes, restore the CCI to service.
  - If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action to obtain command completion.

**Table 2.1-8. Sync and Controller Fuses (CEF)**

| Power Unit/<br>Location | Associated Circuit<br>Pack/Location | Power Unit/<br>Location | Associated Circuit<br>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 2.1-9. Sync and Controller Fuses (non-CEF)**

| <b>Synchronizer</b>                                               |                                             | <b>Main Controller</b>          |                                             |
|-------------------------------------------------------------------|---------------------------------------------|---------------------------------|---------------------------------------------|
| <b>Power Unit/<br/>Location</b>                                   | <b>Associated Circuit<br/>Pack/Location</b> | <b>Power Unit/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| 0SPU /227-010<br><br><br><br><br><br>A8 FUSE<br><br>1SPU /227-064 | 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                                 |
|                                                                   | 0TB /227-032                                | PU /225-148                     |                                             |
|                                                                   | 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 2.1-10. IFTU Fuse Assignment**

| <b>Fuse Boards</b> | <b>Designation (Note)</b>   | <b>Associated Plug-Ins</b>                       |
|--------------------|-----------------------------|--------------------------------------------------|
| ED-9C011-30        | +5A1 through +5A4           | 4 plug-ins (8 NPCs) per fuse<br>(see +5A5 below) |
| ED-9C011-30        | (1-4 through 17-20)<br>+5A5 |                                                  |
| ED-9C012-30        | +5A1 through +5A4           | 1 plug-in (2 NPCs) per fuse                      |
| ED-9C011-30        | (1 through 20)              |                                                  |
|                    | +5A5, number 1              |                                                  |
|                    | +5A5, number 2              |                                                  |
|                    | +5A5, number 3              | FTMI                                             |

**Table 2.1-10. IFTU Fuse Assignment**

| Fuse Boards                                                                                                                                                                                                                   | Designation (Note) | Associated Plug-Ins |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|
|                                                                                                                                                                                                                               | +5A5, number 4     | 0-Side FC           |
|                                                                                                                                                                                                                               | +5A5, number 5     | 1-Side FC           |
| <b>Note:</b> 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 2.1-11. DSPU Fuses (Flexible Bay)**

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

**Note:** Each fuse supplies two DSP circuit packs.

**Table 2.1-12. DSPU Fuses - Original Interface Bay**

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

**Table 2.1-13. DS3U Fuses**

| <b>Fuse Designation</b> | <b>Associated CPs</b> |
|-------------------------|-----------------------|
| L                       | P MXR (HMXR)          |
| K                       | 1 MXR (HMXR)          |
| J                       | 2 MXR (HMXR)          |
| I                       | 3 MXR (HMXR)          |
| H                       | 0 FMT (HFMT)          |
| G                       | UC                    |
| F                       | 1 FMT (HFMT)          |
| E                       | S FLI                 |
| D                       | P FLI                 |
| C                       | 4 MXR (HMXR)          |
| B                       | 5 MXR (HMXR)          |
| A                       | 6 MXR (HMXR)          |

**Table 2.1-14. CCN Fuses - Original Interface Bay**

| <b>CCN0</b>               |                                             | <b>CCN1</b>               |                                             |
|---------------------------|---------------------------------------------|---------------------------|---------------------------------------------|
| <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| JA1 /215-072              | 0CCNI /246-150                              | JA1 /215-088              | 1CCNI /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                             |

**Table 2.1-14. CCN Fuses - Original Interface Bay**

| <b>CCN0</b>               |                                             | <b>CCN1</b>               |                                             |
|---------------------------|---------------------------------------------|---------------------------|---------------------------------------------|
| <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> | <b>Fuse/<br/>Location</b> | <b>Associated Circuit<br/>Pack/Location</b> |
| 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                             |



**Table 2.1-14. CCN Fuses - Original Interface Bay**

| CCN0              |                                     | CCN1              |                                     |
|-------------------|-------------------------------------|-------------------|-------------------------------------|
| Fuse/<br>Location | Associated Circuit<br>Pack/Location | Fuse/<br>Location | Associated Circuit<br>Pack/Location |
| JB6               | 0TSI61 /246-130                     | JB6               | 1TSI61 /269-130                     |
|                   | 0TSI63 /246-136                     |                   | 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 2.1-15. 77-Type, FTU Fuses - Original Interface Bay**

| Fuse<br>(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 |

**Table 2.1-15. 77-Type, FTU Fuses - Original Interface Bay**

| <b>Fuse<br/>(Note)</b> | <b>Associated NPCs</b> |              |              |              |
|------------------------|------------------------|--------------|--------------|--------------|
|                        | <b>FTU 1</b>           | <b>FTU 2</b> | <b>FTU 3</b> | <b>FTU 4</b> |
| 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.

---

**When to Use**      Use this procedure to clear power unit trouble.

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### **Instructions**

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1. To see which power unit has failed, enter **RTRV-ALM-EQPT**;



**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.
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 2.2-1.

**NOTE:**

The FTU and DS3U power units feed a common bus, and low voltage can only be detected if one power unit is failed or disconnected.

**Table 2.2-1. Power Unit Requirements**

| Power Unit Code | Output Requirement (DC Volts)        | Meter Connections |               |
|-----------------|--------------------------------------|-------------------|---------------|
|                 |                                      | Positive Lead     | Negative Lead |
| SM565           | +11.75 to +12.25<br>–11.75 to –12.25 | +V2<br>–V2        | RTN<br>RTN    |
| 411AA           | +5.1 to +5.3                         | +                 | –             |
| TG58            | +4.75 to +5.25<br>–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 2.2-1 is met, re-install any power unit that was removed and proceed to Step **11**.
  - If the requirement of Table 2.2-1 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 DS3U, or HDS3U power unit (when LED is not lighted), use the process of elimination. Remove one power unit for that FTU/DS3U 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-EQPT::UNIT-[q]q:UC;** to avoid possible ESR COND 31 message. Replace the suspect power unit with one that has the same equipment code.

To find a failed FTU or DS3U power unit (when LED is not lighted), use the process of elimination. Remove one power unit for that DS3U, or HDS3U 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:**

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 2.2-1.
    - 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-EQPT::UNIT-[q]q:UC;**.
11. To allow future alarms from subject power unit, enter **INIT-REG::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 **RTRV-STATE-EQPT:::OOS;** to see which packs have been autonomously removed from service.

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-EQPT commands in Figure 2-2-1 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:[xy]:<CP identification>:[ww]{;} or {:<additional info.>}

|              |                               |           |   |                                 |
|--------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww].TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww].TB                  |           |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s         | = | side 0 or 1                     |
|              | CCNI-s;                       | s         | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|              | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|              | ETSI, ECCN-s;                 |           |   |                                 |
|              | UNIT-[q]q:[ww].UC;            | [q]q      | = | unit 01-16                      |
|              | UNIT-[q]q:[ww].{FTMI-d DSP1}; | d         | = | module interface 1-4            |
|              | UNIT-[q]q:[ww].FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww].FLI-k;         | k         | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww].FMT-s;         | s         | = | side (0,1)                      |
|              | UNIT-[q]q:[ww].MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|              |                               | INCL      | = | removes/restores MXR NPCs       |
|              | UNIT-[q]q:[ww].MIU-c;         | c         | = | DS3 group (1-6, P)              |
|              | NPC-<npc No.>:[ww].[SIDE-s];  | <npc No.> | = | NPC No.                         |
|              |                               | s         | = | SIDE for DSPU                   |
|              | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::   | UNIT-[q]q:[ww].MXR-c;         | c         | = | DS3 group (1-6, P)              |

---

**When to Use**

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.

---

**Instructions**

---

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 REPT EVT BOOT FROM PMEM message was not received, continue with Step 3.
  - If the reset sequence proceeds to the receipt of RESET COMPLD (with no error explanation) message, proceed to Step 16.
  - If the reset sequence proceeds to the receipt of RESET COMPLD (with error explanation) 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-EQPT : : SMEM, BKGRND !**



**NOTE:**

This command will overwrite the SMEM card with the contents of the PMEM card.



**NOTE:**

Any database changes made since the last archived copy was made, must be redone.

17. If early codes of NPCs (Series 4 DDC or 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 **RTRV-STATE-EQPT : : : 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 2.3-1:

**RTRV-STATE-COM: : : {00S | FAIL | PEST | ALL};**

M RTRV STATE EQPT ... COMPLD

"<subject>:g,h,i,j,k,l,m,n,o,p"

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

20. See Note. If any CPs are equipped but out-of-service, enter the RST (restore) command per Figure 2.3-1 for the pack.
- If command denial occurs, find the reason for denial in the output message and perform corrective action to obtain command completion.



**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 2.3-1 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:[xy]:<CP identification>:[ww]{;} or {:<additional info.>}; |                                   |           |                                      |
| {RMV-EQPT::                                                     | SYNC-a;                           | a         | = 0 or 1                             |
| /RST-EQPT::                                                     | SYNC-a:[ww]:TLI-<br>n[:SSP-b];    | n         | = 1-4; b = sync port (0 or 1)        |
| /DISC-EQPT::                                                    | SYNC:[ww]:TB                      |           |                                      |
| /DGN-EQPT::                                                     | CCI-s;                            | s         | = side 0 or 1                        |
|                                                                 | CCNI-s;                           | s         | = side 0 or 1                        |
|                                                                 | ETSI-sqq;                         | qq        | = unit 01-16                         |
|                                                                 | TSI-sft;                          | f         | = unit (receiving from) (1-6)        |
|                                                                 | CCB-sf;                           | t         | = unit (transmitting to) (1-6)       |
|                                                                 | ETSI,S,ECCN-s;                    |           |                                      |
|                                                                 | UNIT-[q]q:[ww]:UC;                | [q]q      | = unit 01-16                         |
|                                                                 | UNIT-[q]q:[ww]:{FTMI-<br>d DSPI}; | d         | = module interface 1-4               |
|                                                                 | UNIT-[q]q:[ww]:FC-sd;             | sd        | = FC side (0,1) and FC No.<br>(1-4)  |
|                                                                 | UNIT-[q]q:[ww]:FLI-k;             | k         | = service (S) or protection<br>(P)   |
|                                                                 | UNIT-[q]q:[ww]:FMT-s;             | s         | = side (0,1)                         |
|                                                                 | UNIT-[q]q:[ww]:MMFG-c:            | c         | = DS3 group (1-6, P)                 |
|                                                                 | [FRC][,INCL];                     | FRC       | = forces RMV with no prot.<br>switch |
|                                                                 |                                   | INCL      | = removes/restores MXR<br>NPCs       |
|                                                                 | UNIT-[q]q:[ww]:MIU-c;             | c         | = DS3 group (1-6, P)                 |
|                                                                 | NPC-<npc<br>No.>:[ww]:[SIDE-s];   | <npc No.> | = NPC No.                            |
|                                                                 |                                   | s         | = SIDE for DSPU                      |
|                                                                 | LINK-j;                           | j         | = link 1-6                           |
| DGN-EQPT::                                                      | UNIT-[q]q:[ww]:MXR-c;             | c         | = DS3 group (1-6, P)                 |

**NOTE:** Removing the NPC is service affecting.

---

### Figure 2.3-1. Maintenance Command Construction

22. To check for out-of-service, failed, and pested CPs, enter  
**RTRV-STATE-EQPT::[UNIT-[q]q]::ALL;.**
23. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 2.3-1.

- If command denial occurs, find the reason for denial in the output message and perform corrective action to obtain command completion.
  - If there are no pested CPs or command denials did not occur, this procedure is completed.
-

---

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| ■ Check Facility REPT ALM IDLD or INFO Message                   | GT <a href="#">3.11-1</a> |

---



---

## Clear REPT ALM T3 (Unit DS3) Message

# 3.1

---

**When to Use**                      Use this procedure to clear a REPT ALM T3 (Unit DS3) message

---

### **Instructions**

---



**NOTE:**

Receipt of this message indicates a DS3 signal failure. Since the DACS II equipment is not at fault, the protection switching is not operated. The DACS II sends an AIS signal downstream (except for high BER) on all the component NPC channels.

1. If alarm cutoff is needed, enter **OPR-ACO-ALL** ; .
2. Notice which alarm state is reported as follows:
  - LOS (loss of signal)
  - BER (bit error rate)
  - OOF (out-of-frame)
  - AIS (alarm indication signal).

3. If the AIS state is reported, take no action; this is an information message and the alarm will clear when the trouble is cleared in the upstream equipment. The AIS is sent from upstream equipment to indicate trouble and to prevent registering a local alarm so that the trouble can be isolated to the section with the incoming failure alarm.
  - If the AIS is not reported, proceed to Step 4.
4. To see if other DS3 lines have failed, possibly because of a cable cut or maintenance activity, enter  
**RTRV-ALM-T3:[xy]::[ww];**  
 and read the output message using Figure 3.1-1.

**"UNIT-[q]q:xxloba,<MMFG2>,<MMFG3>,<MMFG4>,<MMFG5>,<MMFG6>"**

- ttt = Total number of DS3 facilities in the output segment reporting reporting critical facility alarms.
- e = Number of lines in the output message.
- xx = DS3 status: CR (critical alarm), ER (error & pested), CL (clear), UX (unit OOS, no data), or dashes for unequipped.
- l = Loss of Signal: 1 (Present), 0 (Absent), or - (no data).
- o = Out of Frame: 1, 0, or - (no data).
- b = Bit Error Rate (High): 1, 0, or - (no data).
- a = Alarm Indication Signal: 1, 0, or - (no data).

---

**Figure 3.1-1. DS3 Alarm Readout**

5. To see LOC (loss of clock) indications at FLI pack, enter  
**RTRV-REG-EQPT::UNIT-[q]q::FLI-{S|P}:ESR;**  
 and read output message using Figure 3.1-2. Each byte consists of 2



hexadecimal digits which when converted to binary gives 8 bits (the bit positions are designated 76543210 from left-to-right). When a bit equals a 1, the LOC exists for that DS3 input.

**"ESR:<byte 1> <byte 2> <byte 3> <byte 4>"**

<byte 1> <byte 2> <byte 3> <byte 4> COMPL

<byte 3> = Loss of Clock on inputs as follows:

Bit 0 = LOC for DS3 No. 1

Bit 1 = LOC for DS3 No. 2

Bit 2 = LOC for DS3 No. 3

Bit 3 = LOC for DS3 No. 4

Bit 4 = LOC for DS3 No. 5

Bit 5 = LOC for DS3 No. 6

Bit 6,7 = Not Used

---

#### Figure 3.1-2. Error Source Register for FLI

6. At this point, you know the trouble is incoming signal loss. So, you can check the line signal using an external test set at the DSX-3 bay or you can assist the far end as required to loop back or isolate the line trouble.

- To check if FLI is causing loss of signal, continue with Step 7.

7. Enter

**RTRV-STATE-EQPT : : UNIT - [q]q : : PROTN;**

for the unit with the alarm to see the FLI maintenance state (IS, OOS, or ISF for in-service and failed) and switch state (SLT -selected, USLT -unselected).

- Make sure both FLI packs are installed in the unit, then enter appropriate command to switch to the other (unselected) FLI.

**SW-TOPROTN-EQPT : [xy] : UNIT - [q]q : [ww] : FLI;**

**SW-TOWRG-EQPT : [xy] : UNIT - [q]q : [ww] : FLI;**

If switch is denied because the other side is out-of-service, clear the trouble on that FLI per Section 4.9 to enable switching.



#### NOTE:

DS3 plug-ins must only be disconnected and replaced if the plug-ins can be removed from service; otherwise, the restore command will be denied after the replacement because the plug-in was never removed. If the mate plug-in is failed, it will have to be replaced to enable switching.

8. Enter  
**RMV-EQPT::UNIT-[q]q::FLI-{S|P};**  
to remove the FLI (now unselected) and replace it.
    - If RMV ...DENYmessage is received, find the reason for denial in the output message and perform corrective action to obtain command completion.
  9. Enter  
**RST-EQPT::UNIT-[q]q::FLI-{S|P};**  
to restore the replacement FLI.

If RST ...DENYmessage is received, find the reason for denial in the output message and perform corrective action to obtain command completion.
-

---

## Clear CGA on DS1 or PBA on E1 Embedded in DS3 Signal

# 3.2

---

**When to Use**                      Use this procedure to clear a REPT ALM T3 (Unit DS3) message

---

### **Instructions**

---



**NOTE:**

Each DS3 signal is composed of 28 DS1 signals. In the case of a hybrid DS3 signal, the signal may be composed of 28 DS1 signals or 21 E1 signals or a combination of the two. This procedure deals with CGA alarms on the embedded DS1 or PBA alarms on the embedded E1 and includes information to determine whether there is a DS3 trouble affecting all the DS1s (E1s) or if isolated DS1 (E1) signals have alarms.

1. If alarm cutoff is needed, enter **OPR-ACO-ALL** ; .
2. Notice the NPC number given in the CGA (PBA) message and notice which alarm state is indicated. See Table 3.2-1 for meanings of states.



**NOTE:**

For any of the outgoing DS1 (E1) signal failures, DACS II error recovery would do looped tests to check the MXR circuitry and would do protection switching if a trouble is present.



**NOTE:**

A red alarm supersedes an AIS; if the DACS II has a red alarm and an AIS is subsequently received in the incoming bit stream (as part of testing), the red alarm will remain instead of changing to AIS. When good transmission is restored (no alarm signal), the red alarm will clear.

**Table 3.2-1. Alarm Designations**

| Designation | Meaning                             |
|-------------|-------------------------------------|
| R           | Red alarm (incoming failure)        |
| Y           | Yellow alarm (outgoing failure)     |
| B           | Both red and yellow (D-bank looped) |
| L           | Local multiframe (LMA)              |
| M           | Remote multiframe (RMA)             |
| F           | Frame format error (FFER)           |
| V           | Line format violation rate (LFVR)   |
| A           | Alarm indication signal             |

3. Check printout for REPT ALMDET ...ANALYSIS REPORT or ERR ESR message showing hardware failure in ECCN or DS3U (HDS3U). A duplex side failure or an unprotected DS3U (HDS3U) failure would cause DS3 and DS1 (E1) signal failures.
  - If there is a failure message for ECCN or DS3U (HDS3U) plug-ins, go to *Hardware Failures* to clear ANALYSIS REPORT or ERR ESR message.
4. If you do not already know if the DS3 signal (or multiple DS1s [E1s]) failed, you can determine the extent of the trouble using the following queries:
  - To see all alarms on the frame, enter **RTRV-ALM-EQPT**;
  - To see DS3 line alarms, enter **RTRV-ALM-T3**;
  - To see the maintenance and protection status of one MMFG/DS3 in a unit, enter **RTRV-PSTATE-T3: :UNIT-[q]q: :DS3-c**;



**NOTE:**

For the DS3 line alarms, there is a field (xxloba) for each MMFG which gives the status (xx = CL, CR, ER, UX, or dash), the LOS (loss of signal - 0,1), BER (bit error rate - 0,1), or AIS (alarm indication signal - 1,0). The meanings of the status words are: CL (clear), CR (critical), ER (error condition, out-of-service or failed in-service), or UX (unit out-of-service, no data output).



**NOTE:**

For protection status, the keywords are made up of the following parts: INH (inhibited), ALW (allowed), MP (manual switch), AP (auto switch), and S (switch).

5. Which failure condition exists? See Note.

- If **DS3 LINE FAILED**, then go to Section 3.1 to clear DS3 alarm message.
- If **ONLY DS1 (E1) LINE(S) FAILED**, then continue with Step 6.



**NOTE:**

With a failed incoming DS3 signal, an AIS (alarm indication signal) is sent out on all the component NPC channels.

6. Enter **RTRV-PRMTR-T3 : [<xy>] : : [ww] : LBO**; to check the DS3 line build out setting.
7. Compare the settings with settings for other units going to the DSX-3, DACS IV, office records, and the following.

| LBO<br>SETTING | TO DSX-3              |                    | TO NETWORK ELEMENT    |                    |
|----------------|-----------------------|--------------------|-----------------------|--------------------|
|                | KS-19224,<br>L2 CABLE | 734A<br>CABLE      | KS-19224,<br>L2 CABLE | 734A<br>CABLE      |
| ON             | 0 to 75 feet          | 0 to 225 feet      | 0 to 150 feet         | 0 to 450 feet      |
| OFF            | 75 to 150<br>feet     | 225 to 450<br>feet | 150 to 300<br>feet    | 450 to 900<br>feet |

- If the LBO is incorrect, continue with Step 8.
- If the LBO is correct, the trouble must be at the far-end M13 (or other) muldem.



**NOTE:**

If clear-channel DS1s (E1s) are involved, a test access connection can be established to the facility to allow testing with external test equipment. Test access procedures are covered in Volume I.

8. If the MXR (HMXR) for the DS3 is not already out-of-service (RMV ...COMPLD in the trouble printout), enter **RMV-EQPT: :UNIT-[q]q: :MMFG-c[INCL]**; for the unit and multiplexer to be changed.

Where:

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

c = MMFG number for subject DS3 (1 through 6).

INCL = Optional, to remove all equipped component NPCs from service.

9. Enter **ED-PRMTR-T3: :UNIT-[q]q: :DS3-c: LBO-{ON|OFF}**; .
10. Enter **RST-EQPT: :UNIT-[q]q: :MMFG-c: [INCL]**;

Where: INCL = Optional, to cause all equipped NPCs on the subject multiplexer to be restored to service.

---

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## Clear DS1 Facility CGA (Except SLC<sup>®</sup> Carrier System)

# 3.3

---

### When to Use

Use this procedure to clear alarms caused by facility failures and NPC hardware failures. Alarms can also be caused by maintenance activity or by incompatible NPC growth specifications. If an obscure alarm occurs on a new facility or one in which the IW (insertion word) was recently changed, the line formats and IW specifications for the NPCs may not be end-to-end compatible.

---

### Instructions

---

This procedure deals with alarms caused by facility failures and NPC hardware failures. Alarms can also be caused by maintenance activity or by incompatible NPC growth specifications. If an obscure alarm occurs on a new facility or one in which the IW (insertion word) was recently changed, the line formats and IW specifications for the NPCs may not be end-to-end compatible.

1. If alarm cutoff is not already operated, enter **OPR-ACO-ALL** ;.
2. Enter **RTRV-ALM-EQPT : : NPC : : CGA** ; to list current CGAs and check far-end conditions to determine if the troubles are associated.
  - If DS1 line connects to 19.2-kb/s MJU shelf, see Table 3.3-1 for summary of how MJU alarms are reported to DACS II. Refer to the *DACS II DS1 Multipoint Junction Unit (MJU) Shelf - Description, Operation, and Maintenance* manual (365-352-007) for information on how to clear these alarms.

- If multiple NPCs are alarmed and the NPCs are in the same FTU, check printout for equipment failures. See *Chapter 1*.
- If multiple NPCs are alarmed and the alarms are not related (on same cable or due to maintenance activity), select one CGA to proceed with and, after isolating that trouble, repeat for the next one.

**NOTE:**

A critical alarm indication on the status panel and a "C" at the beginning of the alarm message means six or more in-service digroups have failed.

**Table 3.3-1. 19.2-kb/s Alarms Registered at DACS II**

| MJU Alarm | DACS II Alarm | Meaning                                                                                                                         |
|-----------|---------------|---------------------------------------------------------------------------------------------------------------------------------|
| HDW       | CGA R         | MJU hardware failure. Flashing light means can't initialize circuits on CP. Steady light means power or microprocessor failure. |
| LOS       | CGA AIS       | Incoming line signal loss detected at MJU.                                                                                      |
| LOF       | CGA Y         | Incoming loss of DS1 framing detected at MJU.                                                                                   |
| RFA       | CGA R         | Remote frame alarm (DACS II detected incoming signal loss and sent RFA to MJU).                                                 |

3. Find the alarm designation in the message (located after the NPC number) and check Table 3.3-2 for the meaning of the alarm (see the following Notes).

**NOTE:**

Trunk conditioning (AIS for clear-DS1; AIS for 24-channel range connections if specified in the cross-connections) is sent downstream from the equipment that registers a red (incoming) alarm. By sending the trunk conditioning downstream, other equipment is alarmed as required to make circuits unavailable, but only one terminal has a red alarm to show the failed section of the route.

**NOTE:**

A red alarm supersedes an AIS; if the DACS II has a red alarm and an AIS is subsequently received in the incoming bit stream (as part of testing), the red alarm will remain instead of changing to AIS.



When good transmission is restored (no alarm signal), the red alarm will clear.

**Table 3.3-2. Alarm Designations**

| <b>Indicator</b> | <b>Meaning</b>                                              |
|------------------|-------------------------------------------------------------|
| A                | Alarm Indication Signal                                     |
| B                | Both red and yellow<br>(not registered with TG80/TG80B NPC) |
| F                | Frame format error rate (TG180 NPC)                         |
| L                | Local multiframe alarm (DMI equipment)                      |
| M                | Remote multiframe alarm (DMI equipment)                     |
| R                | Red; incoming line failure                                  |
| V                | Line format violation (TG180 NPC)                           |
| X                | Multiple alarms (TG180 NPC)                                 |
| Y                | Yellow; outgoing line failure                               |

4. Which alarm did you start with when you came to this procedure? See Note.

- If **Y, B, or M (Remote Alarm)**, continue with Step 5.
- If **R or L (Local Alarm)**, proceed to Step 6.
- If **A**, no action is necessary. This signal (blue signal) originates upstream at an alarmed terminal and is forwarded along the route to prevent multiple red alarms. The trouble can be isolated to a single span with only one red alarm in the route. The far-end NPC can also be grown to send an all 1s signal when it is removed from service.



**NOTE:**

With the CGA present, the NPC sends trunk conditioning toward the connected facility to make far-end equipment unavailable for service. Consequently, even though the NPC could be quickly checked by looping at DSX-1 bay to see if the alarm clears or changes, the following tests should be used unless service has been patched off at the ends of the facility.

5. At DSX-1 bay, use DS1 signal test to check for pulses with no errors at the MON jack for the transmit of the DACS II. Be sure the test set controls are set for the correct line format (D4, ESF, T1DM, etc.).
  - If pulses without errors were detected, the trouble is either in the line going to the far end or in the alarm detection equipment at the far end. Have the far end perform looped D-bank test or check for pulses with an external test set. If the line is at fault, have facility maintenance crew isolate trouble.
  - If no pulses or if errors were detected, proceed to Step 7.

**NOTE:**

The trouble is isolated by testing the signal at intermediate offices with a test set to determine where the trouble first appears along the line. Document 365-800-003 details the isolation procedure for T1 lines.

6. At DSX-1 bay, use test set such as J98725A to test for pulses without errors at the MON jack for the receive line (to DACS II).
  - If pulses without errors were detected, continue with Step 7.
  - If no pulses or pulses with errors were detected, the trouble is on incoming facility or at far-end equipment. Have the far end perform looped D-bank test or check for pulses with external test set. If the line is at fault, have maintenance crew isolate trouble.

**NOTE:**

The trouble is isolated by testing the signal at intermediate offices with a test set to determine where the trouble first appears along the line. Document 365-800-003 details the isolation procedure for T1 lines.

7. 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-EQPT::NPC-<npc No.>::[:INCL];**

Where: <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

INCL = Optional, to enable the removal of which is designated as carrying special service circuits.

**NOTE:**

Enter **DGN-EQPT::NPC-<npc No.>;**.

The diagnostic tests the NPC transmission paths except for the line transformers. So, if the cabling is not at fault, the NPC could still be causing the trouble.

8. If DGN ...STF message is received, replace the plug-in for the NPC as follows and restore the NPC(s) to service.
    - Arrange a time when both NPCs on the DDC plug-in can be removed from service, and enter  
**RMV-EQPT::NPC-<npc No.>::[:INCL];**  
for each NPC; then replace the plug-in (for example, DDC).
    - Enter  
**RST-EQPT::NPC-<npc No.>;**  
for EACH of the removed NPCs.
  9. If the DGN ...STF message is not received, then the trouble is in cabling to DSX-1 bay. Repair or replace cabling using local procedures; after trouble is cleared, enter **RST-EQPT::NPC-<npc No>;** for EACH of the removed NPCs.
-



---

## Clear 2.048-Mb/s Facility AR01 MISC ALM Message

# 3.4

---

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| <b>When to Use</b> | Use this procedure to clear a 2.048-Mb/s Facility AR01 MISC ALM message |
|--------------------|-------------------------------------------------------------------------|

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### **Instructions**

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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 **OPR-ACO-ALL ;**.
2. To list all current primary block alarms, enter **RTRV-ALM-EQPT : :NPC : :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.
  - If the alarms on other facilities are not related, continue with procedure to clear trouble on one facility and repeat for others.

3. When more than one alarm indication is received on the same facility, refer to Table 3.4.1 to determine the priority of the alarm types.

**Table 3.4-1. Alarm Priorities**

| Priority | Alarm Type        | Class            | Prefix          |
|----------|-------------------|------------------|-----------------|
| 1        | A (for AIS)       | MI,DMA<br>or PMA | I, *, **, or *C |
| 2        | R (for PBF)       | PMA              | ** or *C        |
| 3        | Y (for RAI)       | MI               | I               |
| 4        | B (for MBER)      | DMA              | *               |
|          | E (for RBER)      | MI               | I               |
| 5        | V (for A16)[1]    | MI               | I               |
| 6        | L (for LMA)[1]    | PMA              | ** or *C        |
|          | X (EER or LOS)    | PMA              | **              |
| 7        | M (for R16)[1]    | MI               | I               |
|          | I (for RAIS)      | MI               | I               |
|          | S (for Sync Fail) | MI               | I               |

[1]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**), 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 jack on the DPC provides bridging access to the transmit paths at a level approximately 30 dB below the transmit level. The bottom jack is for the odd numbered NPC and the top jack is for the even numbered NPC.

**NOTE:**

The Y alarm type (TS0 bit 3) indicates loss of signal, excessive errors, or loss of frame alignment at the far end, and 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, place loopback at line interface bay.

**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

**RTRV-STATE-EQPT : NPC-<npc No.>;**

for alarmed facility and verify that the NPC is provisioned for CAS.

Where: <npc No.> = NPC number, either extended (for example, [0]001)  
or hierarchical (for example, 01-1-01).

**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<sup>-3</sup>.
  - 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 suspect.

11. If 2.048-Mb/s line signal loopback (toward line side) is requested to allow testing from the far end, place loopback at line interface bay.

**For Alarm Type A, V, M, I, S, 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 ERS 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 (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.
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 **RTRV-STATE-EQPT: :NPC-<npc No.>**;  
for alarmed facility to verify that the NPC is provisioned for CAS format (see Notes 1 and 2).

**NOTE:**

The first digit of the NPC growth specification will be an odd number when the CAS option is selected.

**NOTE:**

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-EQPT:[xy]:NPC-<npc No.>:[ww]:[:INCL];**

Where: INCL = Optional, needed to remove NPC with special circuits.

16. Enter **DGN-EQPT::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-EQPT::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-EQPT::NPC-<npc No.>:[ww]:[:INCL];** for other NPC, and replace the dual pack.
  18. Enter **RST-EQPT::NPC-<npc No.>;** for each of the removed NPCs.
-



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## DS1 Facility Error Messages (Except SLC Carrier System)

# 3.5

---

### When to Use

Use this procedure to clear alarms that are registered when any facility errors reach alarm threshold levels. The DS1 parameters that the DACS II monitors are: BER (bit error rate), BPV (bipolar violations), ERS (errored seconds), ER (error rate), SERS (severe-ERS), SLIP (slips), OOF (out-of-frame), FRER (framing error), CRC (cyclic redundancy), and COFA (change of frame alignment). 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.

---

### Instructions

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This procedure is used to clear alarms that are registered when any facility errors reach alarm threshold levels. The DS1 parameters that the DACS II monitors are: BER (bit error rate), BPV (bipolar violations), ERS (errored seconds), ER (error rate), SERS (severe-ERS), SLIP (slips), OOF (out-of-frame), FRER (framing error), CRC (cyclic redundancy), and COFA (change of frame alignment). 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.

**NOTE:**

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.

1. If alarm cutoff is not already operated, enter **OPR-ACO-ALL;**.
2. Enter **RTRV-STATE-EQPT::NPC-<npc No.>;** for NPC on alarmed facility.

Where: <npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

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 following command with the required parameter identifiers:  
**ED-PRMTR-EQPT:: {NPC-<npc No.> | TYPE-mnxyz}  
 ::rr/l&ss/m...&tt/n;**

Where:

|                      |   |                                                                                                                                                                                   |
|----------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NPC or<br>TYPE field | = | Selects number of NPCs to be changed: one NPC given as extended (for example, [0]001), hierarchical (for example, 01-1-01), or all NPCs with the same type specification (mnxyz). |
| rr,ss,tt             | = | Listing of any of the associated alarm types per Table 3.4-1.                                                                                                                     |
| l,m,n                | = | Predefined number (0 through 3) per Table 3.4-2 which selects alarm threshold.                                                                                                    |

**Table 3.8-1 DE/DS/TE/PB/PC Type Setup Options**

| <b>NPC Type</b> | <b>Option (rr)</b> | <b>Performance Parameter</b>               | <b>Threshold Range</b> | <b>Default Value</b> |
|-----------------|--------------------|--------------------------------------------|------------------------|----------------------|
| DE/TE/<br>DS    | 01                 | SLIP Major Alarm                           | 001-255                | 255                  |
|                 | 02                 | SLIP Minor Alarm                           | 001-255                | 4                    |
|                 | 03                 | Bit Error Rate Major Alarm                 | 10u-6d to 10u-3d *     | 10u-3d †             |
|                 | 04                 | Bit Error Rate Minor Alarm                 | 10u-6d to 10u-3d * †   | 10u-6d               |
|                 | 05                 | Errored Seconds (T1DM & ESF Formats)       | 00001-65535            | 864                  |
|                 | 06                 | Severely Errored Seconds                   | 001-255                | 255                  |
|                 | 07                 | COFA Major Alarm                           | 001-511                | 511                  |
|                 | 08                 | COFA Minor Alarm                           | 1-255                  | 17                   |
|                 | 09                 | SANE (Self Alarm - Near End)               | 0-65535                | 0                    |
|                 | 10                 | SAFE (Self Alarm - Far End)                | 0-65535                | 0                    |
| 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                  |
| PB/PC           | 38                 | US, Unavailable Seconds, 24 hours          | 1-65535                | 65535                |
|                 | 39                 | SLIPS, 15 minutes                          | 1-900                  | 900                  |
|                 | 40                 | SLIPS, 24 hours                            | 1-65535                | 65535                |

\* Range is  $10^{-7}$  to  $10^{-3}$  with ESF or T1DM line format.† Range is  $10^{-6}$  to  $10^{-4}$  (default) for clear-DS1.

**Table 3.5-1. DS1 Option Selection**

| Option (l,m,n) | Meaning                    |
|----------------|----------------------------|
| 0              | Default Value              |
| 1              | First Option Value (set1)  |
| 2              | Second Option Value (set2) |
| 3              | Third Option Value (set3)  |

4. Enter INIT-REG::NPC-<npc No.>[&&[&]-<range>]::<parameter>;, and after recording period, enter RTRV-PRMTR-EQPT::NPC-<npc No.>[&&[&]-<range>]::<parameter>;.

Where:

<parameter> = For DS1 facility: BER, BPV, COFA, CRC, ER, ERS, FRER, OOF, SERS, or SLIP.

<range> = Optional, last NPC of continuous range.

Three ampersands (&s) are needed for hierarchical.

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 DSX-1 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), then refer trouble to tester at far-end terminal equipment.
  - If errors were not registered at far end, continue with Step 7.



**NOTE:**

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 DSX-1 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 DSX-1 to loop the signal toward you.
10. At end receiving looped signal, check errors again either with test set or with DACS II; enter  
**INIT-REG::NPC-<npc No.>::<parameter>;**,  
and, after recording period, enter  
**RTRV-PRMTR-EQPT::NPC-<npc No.>::<parameter>;**.
  - 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 DSX-1 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  
**INIT-REG::NPC-<npc No.>::<parameter>;**  
and, after recording period, enter  
**RTRV-PRMTR-EQPT::NPC-<npc No.>::<parameter>;**.
  - 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 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-EQPT::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-EQPT::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-EQPT::NPC-<npc No.>::[:INCL];** for that NPC and replace the plug-in.
17. Enter **RST-EQPT::NPC-<npc No.>;** for each NPC. Remove all line interface bay signal loops.



**NOTE:**

The parameter counts are cleared during restore operation.



---

## Clear DS1 Facility Error Messages - SLC Carrier System

# 3.6

### When to Use

Use this procedure to clear major or minor alarms that are registered when facility parameters reach threshold levels. The facility parameters that the DACS II monitors are: BPV (bipolar violations), BER (bit error rate), ERS (errored seconds), ER (error rate), SERS (severe-ERS), SLIP (slips), OOF (out-of-frame), FRER (framing error), CRC (cyclic redundancy code), COFA (change of frame alignment), SANE (shelf alarm-near end), and SAFE (shelf alarm-far end). *When OOF or BER/BPV reach major thresholds, an SC ALM message occurs and protection switching operates (if provided) for the digroup.*

---

### Instructions

---

This procedure is used to clear major or minor alarms that are registered when facility parameters reach threshold levels. The facility parameters that the DACS II monitors are: BPV (bipolar violations), BER (bit error rate), ERS (errored seconds), ER (error rate), SERS (severe-ERS), SLIP (slips), OOF (out-of-frame), FRER (framing error), CRC (cyclic redundancy code), COFA (change of frame alignment), SANE (shelf alarm-near end), and SAFE (shelf alarm-far end). *When OOF or BER/BPV reach major thresholds, an SC ALM message occurs and protection switching operates (if provided) for the digroup.*



#### NOTE:

If protection switching is not provided, service on the subject digroup must be patched to the maintenance spare line in order to do the

looped line test in this procedure; unless you have a major alarm, postpone testing until nonbusy hours when service can be patched to a maintenance line.

**NOTE:**

The type of error (SLIP vs. ERS) and whether or not it occurs on a new facility often indicates the source of trouble. Timing SLIPs are usually caused by not having the far end optioned for loop timing or by a malfunctioning loop timing pack. These conditions are more likely on a new facility as is incorrect NPC provisioning.

1. If error message reports shelf alarms - SAFE (far end) or SANE (near end), you only need to check for associated SC ALM messages in this procedure since the shelf alarms are only information messages. The shelf alarms can occur just before the protection switch operates or can accompany other alarms.
2. If alarm cutoff is needed, enter **OPR-ACO-ALL** ;.
3. If there is an SC ALM message present for the same digroup, refer to the appropriate procedure in this chapter as follows:

For SC ALM ...MN, then go to Section 3.8.

For SC ALM ...MJ, then go to Section 3.7.

4. Obtain facility performance information and options for one of the alarmed NPCs by entering

**RTRV-STATE-EQPT::NPC-<npc No.>[&&[&]-<range>];**

Where:

<npc No.> = NPC number, either extended (for example, [0] 001) or hierarchical (for example, 01-1-01).

<range> = Last NPC in a range.

5. Read the reported occurrences and the threshold values for alarms from the listing in the message for the failed parameter to see which threshold options are available; enter **RTRV-OPT-T1::NPCS** ;.
6. If alarms are due to incorrect (too low) alarm threshold, enter following command with the required parameter identifiers:

**ED-PRMTR-EQPT:: {NPC-<npc No.>|TYPE-mnxyz}  
::rr/l&ss/m...&tt/n;**

Where:

- NPC or TYPE Field = Selects number of NPCs to be changed: one field NPC given as extended (for example, [0]001), hierarchical (for example, 01-1-01), or all NPCs with the same type specification (mnxyz).
- rr,ss,tt = Listing of any of the associated alarm typesg. l,m,n =T{ Predefined number (0 through 3). See Table 3.5-1.
- Monitoring of a parameter can be disabled by entering "c" for the alarm threshold.

- After changing the threshold, clear the count  
(**INIT-REG::NPC-<npc No.>**  
**[&&[&]-<range>]::<parameter>;**)  
If trouble persists, continue with Step 7.

7. If protection switching is provided for subject digroup, enter the following commands to operate the protection switch for the digroup and operate far-end loopback:  
**SW-PROTN-T1:: {NPC-<npc No.>|DGx};**  
**OPR-LPBK-T1:: DGx:: LLB: {RT|DL}-ffff;**

Where:

- ffff = RT or DCLU identification.
- DGx = Digroup designation (DGA, DGB, DGC, DGD).

- If protection switching is not provided, continue with Step 8.
8. During nonbusy hours, patch service from subject facility to maintenance spare line.
  9. If the protection switch and far-end loopback were not operated, have far end place loop on line-side at DSX-1 bay.
  10. Either use external test set to check looped line for errors or enter  
**INIT-REG::NPC-<npc No.>[&&[&]-<range>]::<parameter>;**  
and, after about 1 hour, enter  
**RTRV-PRMTR-EQPT::**  
**NPC-<npc No.>[&&[&]-<range>]::<parameter>;.**
  11. If alarm is received on facility or if count for parameter is near alarm threshold, then continue with Step 12.

- If there are no alarms or high counts, there is no trouble at this time. Either return the facility to service and watch for further trouble or test the facility for a longer time.
12. At DSX-1 bay, connect patch cord between DACS-side OUT and IN jacks to loop the signal back. Have far end remove any line-side signal loop.
  13. Either check errors again with test set or enter  
**INIT-REG::NPC-<npc No.>[&&[&]-<range>]::<parameter>;**  
 and, after about 1 hour, enter  
**RTRV-PRMTR-EQPT::NPC-<npc No.>[&&[&]-<range>]::<parameter>;.**
  14. If alarm is received or count for parameter is near alarm threshold, continue with Step 15.
    - If there is no alarm or high count, the trouble is on facility. After trouble is cleared, remove all DSX-1 bay signal loops.
  15. Enter  
**RMV-EQPT::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.

16. Enter  
**DGN-EQPT::NPC-<npc No.>;.**
17. If DGN ...STF message is received, then continue with Step 18.
  - If the DGN ...STF message is not received, the trouble is in cabling to DSX-1 bay; repair or replace cabling. Remove DSX-1 bay line loops and enter  
**INIT-REG::NPC-<npc No.>[&&[&]-<range>]::<parameter>;.**

**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 the internal loop during diagnostics.

18. Arrange a time when both NPCs can be removed from service, enter  
**RMV-EQPT::NPC-<npc No.>::[INCL];** for both NPCs, and replace the plug-in.
19. Enter **RST-EQPT::NPC-<npc No.>;** for each NPC. Remove all DSX-1 bay signal loops.



**NOTE:**

The parameter counts are cleared during restore operation.

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### When to Use

Use this procedure to clear CGA major alarm messages received on: (1) *unprotected* facilities or (2) the protection line itself *when the far end sends a shelf alarm*. The major alarm indicates a possible loss of service. The location is identified by the message keywords: CLF (carrier line failure) and direction (R or Y for receive or transmit), NE (near end; DACS II failure), or FE (far-end; RT failure). Before reporting the location, the DACS II automatically performs a line loopback test and checks the data link for remote alarm indications. Line looping at DSX-1 bays is not used to isolate troubles because line looping interferes with trunk conditioning sent to down stream equipment.

---

### Instructions

---

Use this procedure to clear a CGA major alarm messages received on: (1) *unprotected* facilities or (2) the protection line itself *when the far end sends a shelf alarm*.

1. If alarm cutoff is needed, enter **OPR-ACO-ALL ;**.
2. If the prefix on the alarm message is \*C, five or more digroups have failed. For this situation, check the possibility of maintenance activity or a cable cut that may be causing the failures.
3. From the alarm message, read the RT or DCLU ID, the digroup, and the NPC number which appears after the digroup. Also, notice the alarm location (NE, FE, CLF).

4. Consider the following possible causes of an MJ alarm:
  - Incoming line failure on an unprotected facility
  - Protection switching not available, either already in use or protection line failed. If the switch was manually operated, it must be manually released or the line failure must be cleared to remove the major alarm.
  - Receipt of a shelf alarm from the RT or DCLU or receipt of a yellow (Y) alarm from a *SLC*<sup>®</sup> 96 carrier Mode III RT
  - Failure of the *SLC* carrier data link
  - Failure (or removal from service) of a DACS II NPC.
5. Which message word appears after the NPC number in the alarm message?
  - If **NE**, continue with Step 6.
  - If **FE**, proceed to Step 9.
  - If **CLF**, proceed to Step 12.
6. Check printout for other SC ALM messages (such as MJ CGA) on the protection line which indicate that shelf and major alarms were sent from the RT or DCLU. These messages implicate the connecting equipment. Check the printout for ESR ANALYSIS REPORT messages that name the failed circuit in DACS II.
7. If the subject NPC for the facility failed diagnostics and removed from service, continue with Step 8.
  - If the NPC has not failed and been removed, find other trouble messages in printout and go to *Trouble Identification* to find trouble procedure reference.
8. Replace the plug-in for the NPC as follows to clear the trouble.
  - Arrange a time when the other NPC on the S96D or SS5D card can be removed from service; enter  
**RMV-EQPT : NPC-**  
**<npc No.> : [:INCL];**  
for that NPC, and replace the card.

Where:

- <npc No.> = NPC number, either extended (for example, [0] 001) or hierarchical (for example, 01101).
- INCL = Optional, needed to remove NPC with special circuits.



- Enter  
**RST-EQPT::NPC-<npc No.>;**  
for each NPC.
9. At DSX-1 bay, use office test set to check signal loss and excessive bit error rate at the MON jack for the transmit line (from DACS II).
    - If signal loss or excessive errors were found, continue with Step **10**.
    - If signal loss or excessive errors were not found, the trouble is either in the line going to the far end or at the far end. If the line is at fault, have facility maintenance crew isolate trouble by testing for signal at intermediate offices.
  10. Verify that NPC for alarmed facility is out-of-service to allow more complete diagnostic testing; if necessary, enter  
**RMV-EQPT::NPC-<npc No.>[:INCL];.**
  11. Enter  
**DGN-EQPT::NPC-<npc No.>.**
    - If DGN ...STF message is received, go to *Chapter 5, Manual Diagnostic Failures* to clear failed NPC diagnostic.
    - If DGN ...STF message is not received, the trouble is in cabling to DSX-1 bay. Repair or replace cabling; after trouble is cleared, enter  
**RST-EQPT::NPC-<npc No.>;**  
for each of the removed NPCs.

**NOTE:**

The diagnostic checks the NPC transmission paths except for the line transformers. If the diagnostic passes but there is no trouble in office wiring, the NPC could still be the trouble.

12. From alarm message, notice the alarm direction, either R (local/receive) or Y (remote/transmit). At DSX-bay, use office test set to check signal loss and excessive bit error rate at the MON jack for the failed direction as follows: for R CLF, the incoming line (to DACS II); for Y CLF, the outgoing line (from DACS II).
  - If signal loss or excessive errors were found, continue with Step **13**.
  - If signal loss or excessive errors were not found, then the trouble is either in the line going to the far end or at the far end. If the line is at fault, have facility maintenance crew isolate trouble by testing for signal at intermediate offices.
13. Which direction of CLF alarm do you have?
  - If **R**, continue with Step **14**.
  - If **Y**, refer trouble to line maintenance crew.

14. Enter  
**RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**  
and check the output message for SWMR (switch - manual request) or SWAR (switch - autonomous request) under PLSW heading. The presence of either keyword indicates that the protection switching is activated.
15. Refer trouble to line maintenance personnel; trouble is either on incoming facility or at far-end equipment.

**NOTE:**

If you want to use fault-locate test set to isolate trouble, enter TTST LLB TO command to produce far-end loopback, and connect test set to DSX-1 jacks for failed facility.

**NOTE:**

To prevent looped test set from reaching NPC and possibly clearing the alarm indication, keep cord end or dummy plug inserted in DACS II side DSX-1 IN jack.

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## Clear SC ALM MN {INH/MSW/PSW/ DLF/CGA} Message

# 3.8

### When to Use

This procedure deals with SC ALM messages received on *protected* facilities going to an RT bank or a DCLU (for 5ESS<sup>®</sup> switch). The location is identified by message keywords: CLF (carrier line failure), and the direction (R or Y for receive or transmit), NE (near end; DACS II failure), or FE (far end; RT failure). Before reporting the location for a facility trouble, the DACS II automatically performs a line loopback test and checks the data link for remote alarm indications. Line looping at DSX-1 bays is not used to isolate line troubles because it interferes with trunk conditioning and protection switching.

---

### Instructions

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Use this procedure to deal with SC ALM messages received on *protected* facilities going to an RT bank or a DCLU (for 5ESS<sup>®</sup> switch).

1. If alarm cutoff is needed, enter **OPR-ACO-ALL** ; .

2. Notice the following information in the alarm message: the alarm status MN, RT or DCLU ID, digroup, NPC (after digroup), and trouble location (NE, FE, CLF). See Table 3.8-1 for the interpretation of the alarm message keywords.

**Table 3.8-1. Alarm Interpretation**

| Keyword | Location | Interpretation                                                      |
|---------|----------|---------------------------------------------------------------------|
| INH     | NE or FE | Protection switching inhibited on digroup.                          |
| MSW     | NE or FE | Protection switching manually activated at DACS II.                 |
| PSW     | NE or FE | Protection switching automatically activated at DACS II or far end. |
| DLF     | CLF      | Series 5 data link failure.                                         |

3. Enter  
**RTRV-PRMTR-EQPT::NPC-<npc No.>::SCDG:STATE;**  
for the NPC and check the output message for the protection switch (PLSW) status (either manual or automatic requested/activated - SWMR, SWAR) and LLB status.



**NOTE:**

Protection switching occurs only on the RT side.

4. Consider the following possible causes of the alarm:
  - A line failed (or NPC was removed from service) and service was switched to the protection line.
  - LLB was received from far end and line loopback was activated.
  - The protection line alone failed.
  - Protection switching is inhibited (with no current line failures).
5. Check for INH (inhibit) keyword in message.
  - If NE (near end) is inhibited, determine if the inhibit is required (see Note). If it is not required, enter command to remove the inhibit:  
**ALW-SW-T1::NPC-<npc No.>::RT|DL}-ffff};.**  
You have completed this procedure.
  - If FE (far end) is inhibited on SLC Series 5 FPC, determine if the inhibit is required; if it is not required, contact far end or dispatch maintenance to remove the inhibit. Go to Step 7.
  - If INH keyword does not occur, continue with Step 6.



**NOTE:**

The switch may have been inhibited to free up the switch to protect other lines or for maintenance.

6. Check message for DGP and location CLF keywords (see Table 3.7-1. and Note).
  - If these keywords appear in the message, contact far end or dispatch maintenance.
  - If the DLF keyword appears in the message, it indicates that the Series 5 data link has failed either at the near or far end. If the NE keyword appears, the DACS II NPC is implicated; if the FE keyword appears, the trouble is at the RT site. Continue with this procedure for further testing.
  - Which message word appears after the NPC number in the alarm message?
    - If **NE**, continue with Step 7.
    - If **FE**, proceed to Step 12.
    - If **CLF**, proceed to Step 16.
7. Verify that NPC named for alarmed digroup is out-of-service (RMV NPC ...COMPLD in printout).  
If necessary, enter  
**RMV-EQPT::NPC-<npc No.>[:INCL];**  
to remove NPC from service.

Where:

- <npc No.> = NPC number, either extended (for example, [0] 001)  
or hierarchical (for example, 01101).
- INCL = Optional, needed to remove NPC special circuits.

8. Enter **DGN-EQPT::NPC-<npc No.>;** for the same NPC.



**NOTE:**

The diagnostic checks the NPC transmission paths except for the line transformers. So, if the diagnostic passes but there is no trouble in office wiring, the NPC could still be causing the trouble.

9. Is DGN ...STF message received?
  - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear failed NPC diagnostic.

- If DGN ...STF message is not received, check printout for related trouble messages and go to *Trouble Identification* to find the trouble reference. For SC ALM MJ CGA message, go directly to Section 3.7.
10. Connect an external test set to check for line errors at the DSX-1 MON jack for the *outgoing* span line.
    - If signal loss or high errors are detected, continue with Step **13**.
    - If no signal loss or high errors are detected, the trouble is either on ongoing span line or at RT equipment or DCLU. Before dispatching crew to RT or testing DCLU, you can use the fault-locate test set to isolate the trouble on the ongoing span line or test at DSX-1 for DCLU.
  11. Verify that NPC named for alarmed digroup is out-of-service (RMV NPC ...COMPLD in printout).  
If necessary, enter  
**RMV-EQPT::NPC-<npc No.>[:INCL];**  
to remove NPC from service.

Where:

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

INCL = Needed to remove NPC with designated special circuits.

12. Enter **DGN-EQPT::NPC-<npc No.>;** for the same NPC.



**NOTE:**

The diagnostic checks the NPC transmission paths except for the line transformers. So, if the diagnostic passes but there is no trouble in office wiring, the NPC could still be causing the trouble.

13. Is DGN ...STF message received?
  - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear failed NPC diagnostic.
  - If DGN ...STF message is not received, check printout for related trouble messages and go to *Trouble Identification* to find the trouble reference.
14. From alarm message, notice the direction of the failure which is given in the message as either R for local/receive or Y for remote/transmit. If the following steps show that the line is good, the direction of the alarm will dictate where to look for the problem.

15. Use an external test set to check for errors *in both directions* at DSX-1 **MON** jacks for connecting equipment and for the DACS II.
  - If errors or signal loss are found on the digital line, continue with Step **18**.
  - If errors or signal loss are not found, for R CLF alarm, repair or replace cabling alarm between the DSX-1 bay and the DACS II. For Y CLF alarm, have far-end isolate the trouble.
16. If the failed facility connects to RT equipment and you want to use the fault-locate test set to isolate the trouble on the incoming line, unseat the NPC for the failed primary and connect the test set to the DSX-1 jacks for the failed facility.



**NOTE:**

The OPR-LPBK-T1command can be used to produce a loopback at the RT in order to use the fault-locate test set to isolate trouble on the incoming line.



**NOTE:**

The NPC is moved to prevent the protection switch from releasing when the test set signal is received. The NPC must be installed after the test set is disconnected.

17. Refer line trouble to line maintenance personnel.
-





---

## Clear SC ALM COMP MN RT Message

# 3.9

---

### When to Use

Use this procedure to clear a SC ALM COMP MN RT message. This message indicates that the handshaking exchange required to initiate communications over the data link for *SLC*® Series 5 carrier has failed. This compatibility negotiation takes place at system startup and after the ADD command is used to change the configuration when the digroup A NPC is restored to service.

---

### Instructions

---

This message indicates that the handshaking exchange required to initiate communications over the data link for *SLC*® Series 5 carrier has failed. This compatibility negotiation takes place at system startup and after the ADD command is used to change the configuration when the digroup A NPC is restored to service.

1. If the alarm cutoff is needed, enter **OPR-ACO-ALL** ; .
2. Which explanatory keyword appears after the RT ID in the message?
  - If **AB or CD**, continue with Step 3.
  - If **P**, proceed to Step 4.
  - If **INDX**, proceed to Step 5.
  - If **LBRV or ALP**, proceed to Step 6.

3. The alarm indicates that the status of the digroup pairs is different. To clear the alarm, enter  
**RST-EQPT::NPC-<npc No.>;**

for the remaining digroup NPCs. These digroup pairs (A and B, C and D) are associated at the RT controller, are assigned together in the ADD command, and must be restored without delay so that the pairs have the same status.

Proceed to Step 7.

4. The alarm indicates that the status of the protection digroup NPC is different from that of the primary digroup NPCs. To clear the alarm, enter  
**RST-EQPT::NPC-<npc No.>;**  
for the protection digroup NPC.

Where:

<npc No.> = NPC number, either extended (for example, [0] 001) or hierarchical (for example, 01-1-01).

Proceed to Step 7.

5. The alarm indicates that DACS II is not able to adjust its software within its limits to match the controller at the RT. Verify that the RT equipment is correct for *SLC* Series 5 carrier and for direct connection to DACS II. After the trouble is cleared, enter DLT command to delete the digroup NPC designations and repeat the entire procedure at the DACS II to establish the facility.

Proceed to Step 7.

6. These alarms identify the portion of the handshaking exchange that failed. Contact technical consultant, and, after trouble is cleared, attempt to restore the NPCs to service or repeat the entire procedure at DACS II to establish the facility.
7. After all the digroup NPCs have been restored to service, verify that same alarm does not recur. Enter  
**RTRV-ALM-EQPT::RT-ffff;**  
for the target RT and verify that there is no COMP alarm (by the presence of a dash under heading).
8. If there is an alarm on any of the associated digroup NPCs, enter  
**RTRV-STATE-EQPT::NPC-<npc No.>;**  
and check for timing slips. If present, enter  
**INIT-REG::NPC-<npc No.>;**  
to clear the counts.

---

## Clear SC ALM MN {RT/DL} FE Message

# 3.10

---

**When to Use**                      Use this procedure to clear SC ALM MN {RT/DL} FE message

---

### **Instructions**

---

This trouble message applies to *SLC*® Series 5 carrier. The message indicates an alarm was received from the RT or DCLU (as shown by the FE keyword). Since the message indicates a problem with the far-end equipment, no digroup is named in the message.

1. If the alarm cutoff is needed, enter **OPR-ACO-ALL** ; .
  2. Obtain the RT (or DCLU) bank identifier from the message.
  3. Report the trouble to far-end personnel or dispatch maintenance to the far end. Check for possible failure of the ringing generator at the far end.
-



---

## Check Facility REPT ALM IDLD or INFO Message

# 3.11

---

### When to Use

Use this procedure to clear 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 CGA (carrier group 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.

---

### Instructions

---

Use this procedure to clear a facility alarm IDLD (idled) or INFO (information) messages.

1. Which one of the following keywords appears in the message?
  - If **IDLD**, then continue with Step 2.
  - If **INFO**, proceed to Step 6.
2. This message reports that an alarm has cleared. For facility alarms, the NPC (or DS3 position in the unit) and the type of alarm are given in the message; for example, CGA (carrier group alarm), PBA (primary block alarm), and facility parameter BER.

3. If the message is the CGA type, refer to Table 3.11-1 for the meaning of the alarm type given at the end of the IDLD message.

**Table 3.11-1. CGA Alarm Types**

| Indicator | Meaning                                                     |
|-----------|-------------------------------------------------------------|
| A         | Alarm Indication Signal                                     |
| B         | Both red and yellow<br>(not registered with TG80/TG80B NPC) |
| F         | Frame format error rate (TG180 NPC)                         |
| L         | Local multiframe alarm (DMI equipment)                      |
| M         | Remote multiframe alarm (DMI equipment)                     |
| R         | Red; incoming line failure                                  |
| V         | Line format violation (TG180 NPC)                           |
| X         | Multiple alarms (TG180 NPC)                                 |
| Y         | Yellow; outgoing line failure                               |

4. If the message is for a timing link failure (ESR SYNC messages) or for a DS3 line failure, refer to Table 3.11-2 for the meaning of the alarm type.
5. If the message is the PBA type for a 2.048-Mb/s line, refer to Table 3.11-3 for the meaning of the alarm type given at the end of the IDLD message.

**Table 3.11-2. 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                  |
| MAJ           | Error rate, major alarm       |
| MIN           | Error rate, minor alarm       |

6. An "A" after the CGA word and NPC number reports the receipt of an AIS (alarm indication signal, all 1s, blue signal) from the far end.
7. Consider the following situations in which the far end will send an all 1s signal:
  - On a DS1 facility connecting to multiplexers, the all 1s signal originates at the alarmed terminal (red) in the failed span and is forwarded along the route to prevent multiple red alarms that would hinder troubleshooting.
  - The far-end NPC can be grown to send an all 1s signal when it is removed from service.

**Table 3.11-3. PBA Alarm Parameters**

| Indicator | Meaning                                                                                                 |
|-----------|---------------------------------------------------------------------------------------------------------|
| A         | All 1s signal (AIS) received from far end.                                                              |
| B         | Incoming high bit error rate (BER).                                                                     |
| E         | Excessive errors received at far end (REER).                                                            |
| 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.





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| ■ Clear DS3 Equipment Critical Alarm              | GT <a href="#">4.10-1</a> |

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### When to Use

Use this procedure to clear an ALM ECCN OOS message.

---

### Instructions

---

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 REPT ALMDet ...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 4.1-1 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 ANALYSIS REPORT message or the pack named in the DGN ...STF message if no ANALYSIS REPORT.
4. Enter command to restore the replacement to service per Figure 4.1-1. If associated ETSIs on mate NPC were removed, enter command to restore those packs to service.

**NOTE:**

For DS3U or HDS3U, clearing a failure in the ECCN which caused MMFGs to be failed (and MXRs and MIUs pested) will reboot the MMFGs so that those MMFGs will not have to be restored manually.

- If DGN ...STF message is received, continue with Step 5.
- If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
- If RST ...COMPLD message is received, proceed to Step 8.

**NOTE:** Removing the NPC is service affecting.

### Figure 4.1-1. 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 4.1-1. 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 **RTRV-STATE-EQPT: : : 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 4.1-1, 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:

**RTRV-LOG: [xy] : : [ww] : ERR: HWER, {INT-mn | [DATE-mo-da-yr, ] TOD-hr-mn-sc};**

Suspect Entity:

**RTRV-LOG: [xy] : : [ww] : 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, FMT, 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 4.1-1. ESR Condition Codes - CCI, ETSI**

|         |                                                                                                                                                                                                                           |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COND 01 | Software could not access CCI; pack does not acknowledge.<br>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.                                                                                                                                                                                        |

**Table 4.1-1. ESR Condition Codes - CCI, ETSI**

|    |                                                                                                                                         |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|
| 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.<br>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.                                                                                                               |



**Table 4.1-1. ESR Condition Codes - CCI, ETSI**

|    |                                                           |
|----|-----------------------------------------------------------|
| 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.                              |



---

### When to Use

Use this procedure to clear an ALM CCN OOS message

---

### Instructions

---

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 REPT ALMDet ...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 4.2-1 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 REPT ...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 4.2-1. If associated TSIs on mate NPC were removed, enter command to restore those packs to service.

**NOTE:**

For DS3U or HDS3U, clearing a failure in the CCN which caused MMFGs to be failed (and MXRs and MIUs pested) will reboot the MMFGs so that those MMFGs will not have to be restored manually.

- If DGN ...STF message is received, continue with Step 5.
- If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
- If RST ...COMPLD message is received, proceed to Step 8.

**NOTE:** Removing the NPC is service affecting.

### Figure 4.2-1. 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 4.2-1. 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 **RTRV-STATE-EQPT:::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 4.2-1, 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:

**RTRV-LOG:[xy]::[ww]:ERR:HWER,{INT-mn|[DATE-mo-da-yr,]TOD-hr-mn-sc};**

Suspect Entity:

**RTRV-LOG:[xy]::[ww]: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 4.2-1. ESR Condition Codes - CCNI, CCB, TSI**

| <b>CCNI Pack</b> |                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COND 90          | Software could not access CCNI; pack does not acknowledge.<br>Corrective Action: (1) verify that CCNI is securely seated;<br>(2) look for loss of sync to CCNI and replace CCNI;<br>(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.<br>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.<br>Corrective Action: (1) replace CCNI;<br>(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.                                                                                     |
| <b>CCB Pack</b>  |                                                                                                                                                                                                                                   |

**Table 4.2-1. ESR Condition Codes - CCNI, CCB, TSI**

|                 |                                                                                                                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COND A0         | Software could not access CCB; pack does not acknowledge.<br>Corrective Action: (1) verify that CCB is securely seated;<br>(2) look for loss of sync to CCB and replace CCB;<br>(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).                                                                                                                                                                                                                 |
| <b>TSI Pack</b> |                                                                                                                                                                                                                                                               |
| B0              | Software could not access TSI; pack does not acknowledge.<br>Corrective Action: (1) verify that TSI is securely seated;<br>(2) look for loss of sync through CCB and replace TSI;<br>(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

# 4.3

---

**When to Use**                      Use this procedure to clear an ALM CCN OOS message

---

### **Instructions**

---

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.
  - If unprotected failure in DS3U or HDS3U (see Note), go to Section 4.10.



**NOTE:**

Either the DS3 protection switch is already active for another failure or protection switching is inhibited. For unprotected DS3 failures, the DACS II does not remove (COND AC DNY)(no protection deny) the second failed pack but pests alarms from the second failed pack. After the first failure is cleared, the protection switch can serve the second failure.

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. Also check for DS3 failure that would cause all 28 DS1s to fail. If neither of these conditions exist, proceed to Step 5.
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 pests alarms on the active side.

5. See Figure 4.3-1 for the general format and sequence of messages of the error recovery operation with a REPT ALMDT ...ANALYSIS REPORT . 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.

```

A ff REPT EVT EQPT
  "<entity>,TN-X-dddd,EVENT-eeee,ESR,ERR"
  "<error data bytes>"

A ff REPT ALMDET EQPT
  /* [0.01391] */
  "ANALYSIS, REPORT,EVENT-eeee,ESR,ERR"
  "<action>,<suspect plug-in No.1>"
  "<action>,<suspect plug-in No.2>"
  "<action>,<suspect plug-in No.3>"
  "<action>,<suspect plug-in No.4>"

A ff REPT RMV EQPT
  /* [0.33xxx] */
  "<entity>:<state>"

A ff REPT DGNDET EQPT
  /* [0.41xxx] */
  "<entity>:{ATP|CATP-cc|STF-ppqq},<data bytes>"

```

**Figure 4.3-1. 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 4.3-2. If associated ETSIs or TSIs on mate NPC were removed, enter command to restore those packs to service.



**NOTE:**

For DS3U or HDS3U, clearing a failure in the ECCN which caused MMFGs to be failed (and MXRs (HMXRs) and MIUs pested) will reboot the MMFGs so that those MMFGs will not have to be restored manually.

- If DGN ...STF message is received, continue with Step 8.
- If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
- If RST ...COMPLD message is received, proceed to Step 11.

verb:[xy]:<CP identification>:[ww]{;} or {:<additional info.>}

|              |                               |           |   |                                 |
|--------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s         | = | side 0 or 1                     |
|              | CCNI-s;                       | s         | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|              | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|              | ETSI,S,ECCN-s;                |           |   |                                 |
|              | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|              | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = | module interface 1-4            |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|              | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|              |                               | INCL      | = | removes/restores MXR NPCs       |
|              | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|              | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|              |                               | s         | = | SIDE for DSPU                   |
|              | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::   | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

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 DSP!}! | d         | = | module interface for units 1-4     |
|          | UNIT [q]q,FC sd!         | sd        | = | FC side (0,1) and FC No. (1-4)     |
|          | UNIT [q]q,FLI k!         | k         | = | service (S) or protection (P)      |
|          | UNIT [q]q,FMT s!         | s         | = | side (0,1)                         |
|          | UNIT [q]q,MMFG c         | c         | = | DS3 group (1-6,P)                  |
|          | [,FRC][,INCL]!           | FRC       | = | forces remove with no prot. switch |
|          |                          | INCL      | = | removes/restores MXR NPCs          |
|          | NPC <npc No.>[,SIDE s]!  | <npc No.> | = | NPC number                         |
|          |                          | s         | = | SIDE for DSPU                      |
|          | LINK j!                  | j         | = | link 1-6                           |
| DGN::    | UNIT [q]q,MXR c!         | c         | = | DS3 group (1-6,P)                  |
|          | UNIT [q]q,MIU c!         | c         | = | DS3 group (1-6,P)                  |

**Figure 4.3-2. 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 4.3-2 (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 4.3-2. 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 ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
  - If RST ...COMPLD message is received, proceed to Step **11**.
10. If you are clearing ERR SYNC messages, go to Section 4.5.
  - 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 **RTRV-STATE-EQPT:::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

# 4.4

---

### When to Use

Use this procedure to clear an ERR [ESR] <entity> message.

---

## Instructions

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 4.4-1 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):  
**RTRV-STATE-COM:::ALL;**  
**RMV-EQPT::SYNC-a::TLI-n:SSP-s;**  
**RST-EQPT::SYNC-a::TLI-n:SSP-s;**

| Alarm Keyword | Meaning          |
|---------------|------------------|
| LOS           | Loss of signal   |
| LEN           | Loss of energy   |
| EXJ           | Excessive jitter |
| PHS           | Phase shift      |



| Alarm Keyword | Meaning                 |
|---------------|-------------------------|
| OOF           | Out of frame            |
| MAJ           | Error rate, major alarm |
| MIN           | Error rate, minor alarm |

3. If the plug-in named in the [ESR] ERR 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 4.4-1, 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:[xy]:<CP identification>:[ww]{} or {:<additional info.>}**

|              |                               |      |   |                                |
|--------------|-------------------------------|------|---|--------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a    | = | 0 or 1                         |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n    | = | 1-4; b = sync port (0 or 1)    |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |      |   |                                |
| /DGN-EQPT::  | CCI-s;                        | s    | = | side 0 or 1                    |
|              | CCNI-s;                       | s    | = | side 0 or 1                    |
|              | ETSI-sqq;                     | qq   | = | unit 01-16                     |
|              | TSI-sft;                      | f    | = | unit (receiving from) (1-6)    |
|              | CCB-sf;                       | t    | = | unit (transmitting to) (1-6)   |
|              | ETSI,ECCN-s;                  |      |   |                                |
|              | UNIT-[q]q:[ww]:UC;            | [q]q | = | unit 01-16                     |
|              | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d    | = | module interface 1-4           |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd   | = | FC side (0,1) and FC No. (1-4) |

**verb:[xy]:<CP identification>:[ww]{} or {}:<additional info.>}**

|                                  |           |   |                                 |
|----------------------------------|-----------|---|---------------------------------|
| UNIT-[q]q:[ww]:FLI-k;            | k         | = | service (S) or protection (P)   |
| UNIT-[q]q:[ww]:FMT-s;            | s         | = | side (0,1)                      |
| UNIT-[q]q:[ww]:MMFG-c;           | c         | = | DS3 group (1-6, P)              |
| [FRC][,INCL];                    | FRC       | = | forces RMV with no prot. switch |
|                                  | INCL      | = | removes/restores MXR NPCs       |
| UNIT-[q]q:[ww]:MIU-c;            | c         | = | DS3 group (1-6, P)              |
| NPC-<npc No.>:[ww]:[SIDE-s];     | <npc No.> | = | NPC No.                         |
|                                  | s         | = | SIDE for DSPU                   |
| LINK-j;                          | j         | = | link 1-6                        |
| DGN-EQPT:: UNIT-[q]q:[ww]:MXR-c; | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

---

#### Figure 4.4-1. Maintenance Command Construction

5. Enter command to restore the replacement to service per Figure 4.4-1. If associated ETSIs or TSIs on mate NPC were removed, enter command to restore those packs to service.



**NOTE:**

For DS3U or HDS3U, clearing a failure in the ECCN which caused MMFGs to be failed (and MXRs (HMXRs) and MIUs pested) will reboot the MMFGs so that those MMFGs will not have to be restored manually.

- If DGN ...STF message is received, continue with Step 6.
  - If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action.
  - If RST ...COMPLD 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 **RTRV-STATE-EQPT:::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.

---



---

**When to Use**                      Use this procedure to clear an ERR SYNC message.

---

## **Instructions**

---

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.



**NOTE:**

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-EQPT : :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-EQPT : :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-EQPT : :SYNC-a ;** for the subject sync side.
8. After the TB ovens have reached temperature (30 minutes), enter **RST-EQPT : :SYNC-a ;**.

**COND E0-- OR E1-- CODES**

9. Unplug and reseat the DPLL pack and enter **DGN-EQPT : :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-EQPT : :SYNC-a ;**.
13. Replace SPU pack for failed sync side and reenter sync diagnostic command.
  - If DGN ...ATP (or CATP) is received, enter **RST-EQPT : :SYNC-a ;** for the subject sync side (0 or 1) and to clear all power alarms, enter **INIT-REG : :PWR-00 !**.

- If sync failure persists, enter **RMV-EQPT : :MC ;**, unplug the same CPU2, and check plug-in position for bent pins or damaged backplane. Reinstall CPU2, enter **RST-EQPT : :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-EQPT : :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 **RTRV-STATE-EQPT : :SYNC ;** to determine the active SSP. Remove the active SSP on the failed side as follows:  
**RMV-EQPT : :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-EQPT : :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-EQPT : :SYNC-a ;**. If the sync will remain in service even for a brief time, enter **DGN-EQPT : :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-EQPT : :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-EQPT : :SYNC-a : :TLI-n:SSP-s ;** for both removed SSPs.





---

### When to Use

Use this procedure to respond to a failed status for a plug-in.

---

### Instructions

---

1. To obtain listing of equipped CPs (circuit packs), enter  
**RTRV-STATE-EQPT : : [ {UNIT - [q]q | UNIT | ETSI |  
TSI | NPC | MXR} ] : : EQPD ;**  
See Figure 4.6-1 for link and CCN/ECCN plug-ins if entire frame is checked.

Where:

|                         |   |                                   |
|-------------------------|---|-----------------------------------|
| UNIT-[q]q, UNITS,       | = | Optional, to request the equipage |
| UNIT [q]q, UNITS,       | = | Optional, to request the equipage |
| ETSIs, TSIs, NPCs, MXRs |   | in specific unit or of specific   |
|                         |   | plug-ins instead of entire frame. |
| UNIT-[q]q, UNITS,       | = | Optional, to request the equipage |



#### 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 **RTRV-STATE-EQPT : : [UNIT - [q]q] : : ALL**; 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 **RTRV-STATE-COM : : : {OOS | FAIL | PEST | ALL}**; and see Figure 4.6-1 to read the link and ECCN/CCN output.

**Figure 4.6-1.**

M RTRV STATE EQPT ... COMPLD  
"<subject>:g,h,i,j,k,l,m,n,o,p"

g = Link 1  
h = Link 2  
i = Link 3  
j = Link 4  
k = Link 5  
l = Link 6  
t = Link 7  
m = Cross-Connect Side 0  
n = Cross-Connect Side 1  
o = CCI 0 / CCNI 0  
p = CCI 1 / CCNI 1

#### **Common Equipment Readout**

4. See Note. If any CPs are equipped but out-of-service, enter the RST (restore) command per Figure 4.6-2 for the pack.
  - If command denial occurs, find the reason for denial in the output message and perform corrective action to obtain command completion.

**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 4.6-2 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 **RTRV-STATE-EQPT::[UNIT-[q]q]::ALL;**.
- 7. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 4.6-2.
  - If command denial occurs, find the reason for denial in the output message and perform corrective action to obtain command completion.

verb:[xy]:<CP identification>:[ww]{;} or {:<additional info.>};

|              |                               |           |   |                                 |
|--------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s         | = | side 0 or 1                     |
|              | CCNI-s;                       | s         | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|              | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|              | ETSI, ECCN-s;                 |           |   |                                 |
|              | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|              | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = | module interface 1-4            |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|              | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|              |                               | INCL      | = | removes/restores MXR NPCs       |
|              | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|              | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|              |                               | s         | = | SIDE for DSPU                   |
|              | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::   | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

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                   |

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

|        |                           |           |   |                                |
|--------|---------------------------|-----------|---|--------------------------------|
| {RMV:: | SYNC a!                   | a         | = | 0 or 1                         |
|        | 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 TSISs on the side      |
|        | UNIT [q]q, UC!            | [q]q      | = | unit (1-16)                    |
|        | UNIT [q]q, {FTMI d DSP!}! | 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                       |

---

**Figure 4.6-2. Maintenance Command Construction**

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## Clear Transient Trouble Using ERROR LOG Message

# 4.7

---

**When to Use**                      Use this procedure to clear transient trouble using the ERROR LOG message

---

### **Instructions**

---

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. DGNDT 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 **RTRV-LOG:[xy]::[ww]: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 4.7-1.

| HOST00xx | ENTT00xx | ERRC00xxxx | ERRTxxxx | TRANxxxx | EVENxxxx |
|----------|----------|------------|----------|----------|----------|
| <data7>  | <spare>  | <spare>    | <data10> | <data11> | <data12> |
| <data13> | <data14> | <data15>   | <data16> | <data17> | <data18> |

**Figure 4.7-1. General Error History Message Format**

- Refer to Table 4.7-1 for the meaning of the first 2 data bytes (HOST - host ID and ENTT -entity) and to Table 4.7-2 for the meaning of data 3 (ERRC -error class).

**Table 4.7-1. 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        |



**Table 4.7-1. Host ID and Entity (Continued)**

| Host | Meaning       | ENTT | Meaning  |
|------|---------------|------|----------|
| 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 4.7-2. 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         |

**Table 4.7-2. Error Class Meanings**

| Code | Meaning                                         |
|------|-------------------------------------------------|
| 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 4.7-2 and Table 4.7-3).
  - 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 4.7-2).
  - 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** = 16ud 16ud 16ud 16ud  
**Example: Hex** = 005A  
**Decimal Number** = (0 x 16ud)  
+ (0 x 16ud)  
+ (5 x 16ud)  
+ (A x 16ud), where 16ud = 1  
**0s** = (0 x 0) = 0  
**5** = (5 x 16) = 80  
**A** = + (A x 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 4.7-2. Hexadecimal-to-Decimal Conversion Example**

**Table 4.7-3. 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 |

- Find the meaning of the condition code given in data 4 (ERRT) from Table 4.8-1 or Table 4.8-2 in GT 4.8.

**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.

- Enter command to remove the entity from service per Figure 4.7-3.

7. Enter command to diagnose same pack per Figure 4.7-3.

**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 GT 4.8) and enter commands to restore replacement packs to service per Figure 4.7-3.
10. If same transient messages are recorded again in error history on PMEM, contact technical consultant.

**verb:[xy]:<CP identification>:[ww]{;} or {:<additional info.>};**

|              |                               |      |   |                                 |
|--------------|-------------------------------|------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a    | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n    | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |      |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s    | = | side 0 or 1                     |
|              | CCNI-s;                       | s    | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq   | = | unit 01-16                      |
|              | TSI-sft;                      | f    | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t    | = | unit (transmitting to) (1-6)    |
|              | ETSI,S,ECCN-s;                |      |   |                                 |
|              | UNIT-[q]q:[ww]:UC;            | [q]q | = | unit 01-16                      |
|              | UNIT-[q]q:[ww]:{FTMI-d[DSPI]; | d    | = | module interface 1-4            |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd   | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww]:FLI-k;         | k    | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww]:FMT-s;         | s    | = | side (0,1)                      |
|              | UNIT-[q]q:[ww]:MMFG-c;        | c    | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC  | = | forces RMV with no prot. switch |
|              |                               | INCL | = | removes/restores MXR NPCs       |

|                                  |           |   |                    |
|----------------------------------|-----------|---|--------------------|
| UNIT-[q]q:[ww]:MIU-c;            | c         | = | DS3 group (1-6, P) |
| NPC-<npc No.>:[ww]:[SIDE-s];     | <npc No.> | = | NPC No.            |
|                                  | s         | = | SIDE for DSPU      |
| LINK-j;                          | j         | = | link 1-6           |
| DGN-EQPT:: UNIT-[q]q:[ww]:MXR-c; | c         | = | DS3 group (1-6, P) |

---

**Figure 4.7-3. Maintenance Command Construction**

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## Isolate Trouble with ERR COND Code Meanings

# 4.8

---

**When to Use**                      Use this procedure to isolate trouble with ERR COND Code meanings

---

### **Instructions**

---

1. From Table 4.8-1 or Table 4.8-2 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:

**RTRV-LOG: [xy] : : [ww] : ERR:HWER, {INT-mn |  
[DATE-mm-dd-yy, ]TOD-hh-mm-ss}];**

Suspect Entity:

**RTRV-LOG: [xy] : : [ww] : 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,  
CI, CRO, DMB, DSPI, EBX, EMT, ETSI,  
FC, FTMI, LINK, MC, MP, MTC, NPC,  
DDC, FLI, FMT, MIU, MJU, MXR, SRM,  
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 4.8-1. ESR Condition Codes - CCNI, CCB, TSI**

| <b>CCNI Pack</b> |                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COND 90          | Software could not access CCNI; pack does not acknowledge.<br>Corrective Action: (1) verify that CCNI is securely seated;<br>(2) look for loss of sync to CCNI and replace CCNI;<br>(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.<br>Corrective Action: enter command to restore CCNI.                                                                                                                                                        |
| 94               | Autonomous switch error. Circuit in CCNI for side switch independent of MP disagrees with mate CCNI.                                                                                                                              |



**Table 4.8-1. ESR Condition Codes - CCNI, CCB, TSI (Continued)**

|                 |                                                                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 95              | Bus status error. Circuit cannot determine active side.<br>Corrective Action: (1) replace CCNI;<br>(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.                                                                                      |
| <b>CCB Pack</b> |                                                                                                                                                                                                                                    |
| COND A0         | Software could not access CCB; pack does not acknowledge.<br>Corrective Action: (1) verify that CCB is securely seated;<br>(2) look for loss of sync to CCB and replace CCB;<br>(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).                                                                                                                                                                                      |
| <b>TSI Pack</b> |                                                                                                                                                                                                                                    |
| B0              | Software could not access TSI; pack does not acknowledge.<br>Corrective Action: (1) verify that TSI is securely seated;<br>(2) look for loss of sync through CCB and replace TSI;<br>(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.                                                                                                                                                    |

**Table 4.8-1. ESR Condition Codes - CCNI, CCB, TSI (Continued)**

|    |                                                                                                                                                                                                                                                               |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 4.8-2. ESR Condition Codes**

|                    |                                                                                   |
|--------------------|-----------------------------------------------------------------------------------|
| <b>MC-CI Pack</b>  |                                                                                   |
| COND D0            | RAM parity error.                                                                 |
| D5                 | Illegal/unknown condition code.                                                   |
| <b>MC-MP Pack</b>  |                                                                                   |
| 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.<br>Corrective Action: verify that MP pack is securely seated. |
| <b>MC-MTC Pack</b> |                                                                                   |
| 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.                                                                     |
| <b>MC-EBX Pack</b> |                                                                                   |
| COND D5            | Illegal/unknown condition code.                                                   |
| 16                 | Write RAM parity error, low byte.                                                 |
| 17                 | Write RAM parity error, low byte.                                                 |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                                               |                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------|
| 18                                            | RAM parity, CPU-EBX.                                                                                 |
| 19                                            | D9 bit error.                                                                                        |
| 1A                                            | D10 bit error.                                                                                       |
| 1B                                            | D11 bit error.                                                                                       |
| 20                                            | Access error.<br>Corrective Action: (1) verify that EBX is securely seated;<br>(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.                                                                     |
| <b>Unit-UC or UBX Pack (Types UA, UD, UC)</b> |                                                                                                      |
| COND 10                                       | CPU parallel bus parity error.                                                                       |
| 11                                            | CPU serial bus parity error.                                                                         |
| 0F                                            | CPU internal bus error.                                                                              |
| 31                                            | Unit UC is not sane.<br>Corrective Action: verify that unit CPU is securely seated.                  |
| D0                                            | Unit UC has RAM parity error.<br>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.<br>Corrective Action: replace UBX pack.                                             |
| D5                                            | Invalid condition code.                                                                              |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                  |                                                                                                                                                                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30               | Power failure.                                                                                                                                                                                                                                                         |
| <b>FTMI Pack</b> |                                                                                                                                                                                                                                                                        |
| 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.<br>Corrective Action: (1) verify that the FTMI is securely seated;<br>(2) verify that FCs are securely seated and not failed;<br>(3) verify that CCI 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.<br>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.<br>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.                                                                                                                                                                                                        |
| <b>FC Pack</b>   |                                                                                                                                                                                                                                                                        |
| COND D5          | Illegal/unknown condition code.                                                                                                                                                                                                                                        |
| 4C               | Software could not access FC; pack does not acknowledge.<br>Corrective Action: (1) verify that FC is securely seated;<br>(2) look for loss of sync from CCI and ETSIs and replace FC;<br>(3) look for unit UBX or UC trouble.                                          |
| 4D               | Pack timer error.                                                                                                                                                                                                                                                      |

**Table 4.8-2. ESR Condition Codes (Continued)**

|    |                                                                                                                                                                                                 |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4E | Circuit ID error.                                                                                                                                                                               |
| 4F | Transmit formatter error on ports from NPCs.<br>If most of the ports are listed in ESR, the FC is probably bad.                                                                                 |
| 50 | Receive formatter error on ports from NPCs.<br>Corrective action: (1) Restore FC; if restore denies, replace pack.<br>(2) If FC is removed again and NPC is implicated in message, replace NPC. |
| 51 | Sanity timer interrupt.                                                                                                                                                                         |
| 52 | RF bus error.                                                                                                                                                                                   |

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**DS3U MXR Pack**

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|         |                                      |
|---------|--------------------------------------|
| 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.    |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                      |                                          |
|----------------------|------------------------------------------|
| DD                   | Chan controller config register error.   |
| DE                   | Chan controller instruction RAM error.   |
| DF                   | Chan controller parity error.            |
| COND E1              | MXR access error.                        |
| E2                   | Hard error stuck bit.                    |
| E3                   | Facility error stuck bit.                |
| E4                   | MXR is in reset state.                   |
| E5                   | PIF bus parity error.                    |
| E6                   | Loss of clock from unselected FLI.       |
| E7                   | 45 MHz not phase locked to system clock. |
| E8                   | Firmware error.                          |
| E9                   | HSCC device error.                       |
| EA                   | PIF I/O device error.                    |
| EB                   | M13 summary register stuck bit.          |
| EC                   | Transceiver summary stuck bit error.     |
| ED                   | Program error.                           |
| EF                   | RAM error.                               |
| <b>DS3U MIU Pack</b> |                                          |
| COND 01              | CEC bit (on HSCC) not cleared.           |
| 02                   | Firmware error.                          |
| 03                   | Excessive transmit data underruns.       |
| 04                   | Invalid acknowledge from MXR.            |
| 05                   | No acknowledge from MXR.                 |
| 06                   | RAM data error.                          |
| 07                   | Invalid code checksum.                   |
| 08                   | FDL (on HSCC) register error.            |
| 09                   | MXR (on HSCC) register error.            |
| 0A                   | EPROM checksum error.                    |
| 0B                   | Timer 1 error.                           |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                                            |                                                                                                                                                                                                                                  |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0C                                         | Timer 2 error.                                                                                                                                                                                                                   |
| 0D                                         | DUART error.                                                                                                                                                                                                                     |
| 0E                                         | MIU access error.                                                                                                                                                                                                                |
| D5                                         | Illegal/unknown condition.                                                                                                                                                                                                       |
| D6                                         | Communication error.                                                                                                                                                                                                             |
| <b>FTU-NPCs (Common for DPCs and DDCs)</b> |                                                                                                                                                                                                                                  |
| COND 53                                    | DDC bus error.                                                                                                                                                                                                                   |
| 54                                         | Software could not access NPC; pack does not acknowledge.<br>Corrective Action: (1) verify that NPC is securely seated;<br>(2) check loss of sync from FC;<br>(3) check unit UBX or UC trouble;<br>(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.<br><br>Corrective Action: enter command to restore NPC.                                                                                                                                            |
| 5C                                         | Channel controller parity error.<br>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.                                                                                                                                                                                      |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| 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.                                    |
| <b>DSPU NPC - MJU</b> |                                                               |
|                       | 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.                      |
| <b>DSPU NPC - SRM</b> |                                                               |
|                       | Corrective Action for COND C8-CF: replace SRM (subject side). |
| COND C8               | Serial access error.                                          |
| C9                    | Clock error.                                                  |
| CA                    | Processor interface failure.                                  |
| CB                    | Input data interface failure.                                 |
| CC                    | Error correction block failure.                               |
| CD                    | Control memory failure.                                       |
| CE                    | Multiplexer block failure.                                    |



**Table 4.8-2. ESR Condition Codes (Continued)**

|                           |                                                                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CF                        | Output block failure.                                                                                                                                                                                                   |
| <b>FTU NPC - CEPT DPC</b> |                                                                                                                                                                                                                         |
| COND 3D                   | ROM error.                                                                                                                                                                                                              |
| 3C                        | TS0 monitoring overflow.                                                                                                                                                                                                |
| 3E                        | Loss of timing.                                                                                                                                                                                                         |
| 3F                        | OOS test ran while pack was in service.                                                                                                                                                                                 |
| <b>DSPU-DSPI</b>          |                                                                                                                                                                                                                         |
| COND 6D                   | Software could not access DSPI; pack does not acknowledge.<br><br>Corrective Action: (1) verify that DSPI is securely seated;<br>(2) look for loss of sync from UBX and replace DSPI;<br>(3) look for unit CPU trouble. |
| 6E                        | Bus parity error. Trouble either on unit CPU or DSPI.                                                                                                                                                                   |
| 6F                        | Bus address parity error.<br><br>Corrective Action: enter command to restore DSPI.                                                                                                                                      |
| D3                        | Stuck bit on unit CPU, but no ESR bits set on DSPI.                                                                                                                                                                     |
| <b>CPR Packs</b>          |                                                                                                                                                                                                                         |
| 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.                                                                                                                                                                                          |
| <b>DSPU NPC - DMB</b>     |                                                                                                                                                                                                                         |
| COND 70                   | Software could not access DMB. Corrective Action:<br>(1) verify that DMB is securely seated; (2) check clock loss from DSPI;<br>(3) replace DMB; and (4) replace DSPI.                                                  |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                 |                                                                                                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                   |
| <b>CCI Pack</b> |                                                                                                                                                                                              |
| COND 01         | Software could not access CCI. Corrective action:<br>(1) verify that CCI is securely seated; (2) look for loss of clock<br>(3) replace CCI; and (4) check MC, EBX, or CPU interface trouble. |

**Table 4.8-2. ESR Condition Codes (Continued)**

|                  |                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                                                   |
| <b>ETSI Pack</b> |                                                                                                                                                                                                                                     |
| COND 20          | Software could not access ETSI; pack does not acknowledge.<br>Corrective Action: (1) verify that ETSI is securely seated;<br>(2) look for loss of sync to ETSI and replace ETSI;<br>(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.                                                                                                                                                                                                       |

**Table 4.8-2. ESR Condition Codes (Continued)**

|    |                                                           |
|----|-----------------------------------------------------------|
| 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.                              |

**Table 4.8-2. ESR Condition Codes (Continued)**

| <b>SYNC Packs</b> |                                                                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| COND 96           | Transient error on sync pack.                                                                                                                |
| D5                | Illegal/unknown condition.                                                                                                                   |
| E000              | Gross SYNC error registered at CCI.<br>Communications with SYNC failed.<br>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.<br>Trouble with SYNC or in MC-MP.                                                                  |
| E100              | Transient caused by MP to SYNC communications failure.<br>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.                                                                              |

**Table 4.8-2. ESR Condition Codes (Continued)**

|           |                                                                                                                                                                                                |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 $\mu$ 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.                                                                            |
| 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.                                                                                                                          |

**Table 4.8-2. ESR Condition Codes (Continued)**

|      |                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.<br>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.<br>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.                                                                           |

**Table 4.8-2. ESR Condition Codes (Continued)**

|      |                                                            |
|------|------------------------------------------------------------|
| 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. |



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**When to Use**                      Use this procedure to clear an ERR HARDWARE message.

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### **Instructions**

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1. Notice which plug-in is named in the last line of the REPT ALMDT EQPT "ERR,HARDWARE" message. 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 **hardware database mismatch**, then continue with Step 5.
  - If **can't access link**, then proceed to Step 8.
  - If **hardware boot failed**, 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.  
**RTRV-STATE-EQPT : : [UNIT - [q]q] : : ALL ;**  
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-EQPT command for CP per Figure 4.9-1. This procedure is completed.

**verb:[xy]:<CP identification>:[ww]{} or {}<additional info.>}**

|              |                               |           |   |                                 |
|--------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s         | = | side 0 or 1                     |
|              | CCNI-s;                       | s         | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|              | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|              | ETSI,S,ECCN-s;                |           |   |                                 |
|              | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|              | UNIT-[q]q:[ww]:{FTMI-d DSPi}; | d         | = | module interface 1-4            |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|              | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|              |                               | INCL      | = | removes/restores MXR NPCs       |
|              | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|              | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|              |                               | s         | = | SIDE for DSPU                   |
|              | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::   | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

**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                   |

|                                     |                          |                                     |
|-------------------------------------|--------------------------|-------------------------------------|
| verb::<CP identification>[,option]! |                          |                                     |
| {RMV::                              | SYNC a!                  | a = 0 or 1                          |
|                                     | 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 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                        |
| DGN::                               | UNIT [q]q,MXR c!         | c = DS3 group (1-6,P)               |
|                                     | UNIT [q]q,MIU c!         | c = DS3 group (1-6,P)               |

---

**Figure 4.9-1. Maintenance Command Construction**

6. If plug-in named in message was not removed from service and diagnosed, enter the **RMV-EQPT** and **DGN-EQPT** commands for the CP per Figure 4.9-1.
  - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear the failed diagnostic.
7. Enter RST-EQPT command for plug-in.
  - If trouble persists, contact technical consultant.

**For Can't Access Link, 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 4.9-1.
  - If DGN ...STF message is received, go to *Manual Diagnostic Failures* to clear the failed diagnostic.

**For Hardware Boot Failed, Continue Here**
10. Hardware boot failed. If the subject pack has not been removed from service, enter RMV command to remove pack per Figure 4.9-1.
11. Enter RST command to restore same pack to service per Figure 4.9-1.

12. Find expanded explanation in Table 4.9-1 and perform corrective action. Refer to Figure 4.9-1 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 4.9-1 Error Hardware Explanations**

| <b>Code</b>                         | <b>Explanation/Corrective Action</b>                                                                                                                                                                                                |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hardware database mismatched        | Hardware code and data base do not agree.                                                                                                                                                                                           |
| Hardware failure                    | Attempt to write to named pack failed.                                                                                                                                                                                              |
| Hardware boot failed                | Attempt to boot (reset or restore) pack failed.                                                                                                                                                                                     |
| Can't access link                   | X.25 layer 3 protocol failure; far-end is not transmitting or responding. Check far-end equipment or software failure.                                                                                                              |
| Transmit time-out                   | 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 <b>DGN-EQPT : : LINK-j ;</b> and replace CI to clear failure. |
| Receive time-out                    | X.25 layer 1 or 2 protocol failure; far-end is not transmitting or responding. Check far-end equipment or software failure.                                                                                                         |
| Software failure...<br>link removal | Software failure forced link out-of-service. Enter <b>RST-EQPT : : LINK-j ;</b> .                                                                                                                                                   |
| Unit could not be reset             | Unit could not be reset for boot. Enter appropriate RMV command (UNIT-[q]q, UC or MC), replace CPU (in UNIT) and EMTC (in MC), and restore pack. Check unit to MC cabling.                                                          |
| Unit failed sanity check            | Unit failed sanity check for boot. Enter <b>RMV-EQPT : : UNIT-[q]q::UC;</b> , replace CPU in unit, and restore pack.                                                                                                                |
| Failure to insert TCC               | NPC failed to insert trunk conditioning. Enter <b>DGN-EQPT : : NPC;</b> . Remove and replace if necessary.                                                                                                                          |

**Table 4.9-1 Error Hardware Explanations (Continued)**

| <b>Code</b>                  | <b>Explanation/Corrective Action</b>                                                                                                                                                 |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Failure to remove TCC        | NPC failed to remove trunk conditioning. Remove and replace NPC.                                                                                                                     |
| Failure to switch CNN sides  | Failure to verify ECCN side switch. Enter <b>DGN-EQPT: :CCI-s</b> ; for each side. If no failure is found, enter commands to remove and restore each CCI to reestablish active side. |
| NPCs facility queue overflow | NPCs/facilities hardware error overflow. Check for DS3 or multiple facility failure or all NPCs in unit failing because of common equipment.                                         |

**Table 4.9-2 Error Hardware Explanations**

| <b>Code</b> | <b>Explanation/Corrective Action</b>                                                                                                                                                                                      |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 <b>DGN: :LINK!</b> 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 <b>RST: :LINK j!</b>                                                                                                                                                   |
| 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 <b>UNIT UC</b> , replace CPU in unit, and restore pack.                                                                                                                   |
| E9          | NPC failed to insert trunk conditioning. Enter <b>DGN: :NPC!</b> Remove and replace if necessary.                                                                                                                         |
| EA          | NPC failed to remove trunk conditioning. Remove and replace NPC.                                                                                                                                                          |

**Table 4.9-2 Error Hardware Explanations (Continued)**

| <b>Code</b> | <b>Explanation/Corrective Action</b>                                                                                                                                             |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EB          | Failure to verify ECCN side switch. Enter <b>DGN : : CCI s!</b> 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.                                                                                                                                                  |



---

## Clear DS3 Equipment Critical Alarm

# 4.10

---

### When to Use

Use this procedure to clear a DS3 Equipment Critical Alarm.

---

### Instructions

---

**NOTE:**

One thing to remember about DS3 protection switching is that a failed MMFG that cannot be automatically switched to protection will be marked ISF (in-service, failed). An MMFG with ISF status cannot be removed because the protection switch is in use, and the MMFG cannot be restored (after plug-in replacement) because it is already in-service. After one MMFG failure is cleared, another failed MMFG will switch to protection.

1. If alarm cutoff is needed, enter **OPR-ACO-ALL**.
2. Consider the following possible causes of the critical alarm:
  - The DS3 facility has failed. The DS3U (HDS3U) protection switching only protects against loss of service due to DS3U (HDS3U) plug-in failures.
  - More than one MXR (HMXR) function group has failed. Only one protection MXR (HMXR) function group is provided for backup protection.

- An MXR (HMXR) function group has failed and the protection switching for that group is inhibited.
3. Study printout to find the trouble message(s). Look for REPT ALMDET ...ANALYSIS REPORT messages. The DACS II analyzes all the error inputs and reports packs that have failed diagnostics and related packs that can also cause the failure.
  4. Check for blown fuses. 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 fuse boards or 80-type LED fuses.
    - If there is a blown fuse at the frame, go to *Power Failures*.
  5. If there is an REPT ALM T3 ...UNIT DS3 message, go to *Facility Alarms* to clear UNIT DS3 alarm.
    - If there is no unit DS3 alarm message, continue with Step 6.
  6. There are two vital retrieve commands for the DS3 equipment:
    - **RTRV-STATE-T3::UNIT-[q]q::DS3-c[&&-d];**  
which shows the protection state (PSTATE) and status of the MXR function group and the facility (or continuous range of MMFGs and facilities).
    - **TRV-STATE-EQPT::UNIT-[q]q::PROTN;**  
which shows the MXR and MIU maintenance and the protection states for each MMFG and FLI circuit pack.
  7. Enter the query commands from above and study the output information using the following:
    - Facility failures are indicated by the presence of OOF (out-of-frame), LOS (loss of signal), or HBER (high BER) in the DS3 query.
    - Table 4.10-1 gives the meanings of the various codes in the PSTATE output. The message is as follows: (1) the protection MMFG is listed first on the left, and (2) for each MMFG, the top code is the MXR maintenance status, next down the MIU (if any) status, next the MMFG protection status, and lastly, the protection availability.
  8. Which problem is indicated by the outputs of the query commands?
    - If **More Than One MMFG Has Failed**, proceed to Step 15.
    - If **Protection Switching Inhibited**, continue with Step 13.
    - If **Undetermined**, continue with Step 9.
  9. Enter command to switch FLI to protection as follows:  
**SW-TOPROTN-EQPT:[xy]:UNIT-[q]q:[ww]:FLI;**
  10. If critical alarm clears, continue with Step 11.

- If alarm does not clear, enter following command to switch back to service FLI and go to Section 4.3 to *clear ERR <entity> messages*.  
**SW-TOWRG-EQPT:[xy]:UNIT-[q]q:[ww]:FLI;**
11. Enter command to remove FLI per Figure 4.10-1 and replace service FLI plug-in (FLI S).
  12. Enter command to restore replacement per Figure 4.10-1.
    - If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action to obtain command completion.
    - If RST ...COMPLD message is received, enter following command to switch back to service FLI; this procedure is completed.  
**SW-TOWKG-EQPT:[xy]:UNIT-[q]q:FLI;**
  13. Enter **ALW-SW-EQPT::UNIT-[q]q::MMFG-c:PROTN;** for the MMFG for which switching is inhibited.
  14. If alarm status changes from critical to major, then proceed to Step 17.
    - If the status does not change, repeat from Step 8.

**Table 4.10-1. Maintenance and Protection Keywords**

| Keyword                   | Meaning                                                     |
|---------------------------|-------------------------------------------------------------|
| <b>Maintenance Status</b> |                                                             |
| IS                        | In-Service                                                  |
| ISF                       | In-Service, but Failed and Pested                           |
| OOS                       | Out-Of-Service                                              |
| UEQD                      | Unequipped                                                  |
| <b>Protection Status</b>  |                                                             |
| 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   |

**Table 4.10-1. Maintenance and Protection Keywords**

| <b>Keyword</b>                 | <b>Meaning</b>                                                |
|--------------------------------|---------------------------------------------------------------|
| MPINH                          | Manual Protection Switch Active and Auto Switchback Inhibited |
| APINH                          | Auto Protection Switch Active and Auto Switchback Inhibited   |
| (dashes)                       | Service MMFG Not Equipped                                     |
| <b>Protection Availability</b> |                                                               |
| AVL                            | Available for Switching                                       |
| NVL                            | Not Available for Switching                                   |
| (dashes)                       | MMFG Not Selected for Service                                 |

15. From the query information and the trouble printout, determine which MMFG is switched to protection.

**NOTE:**

The first MMFG to fail will be served by the protection MMFG, and the other failed MMFGs are marked ISF (in-service and failed). If all the MMFGs in the unit have failed, MMFG 1 will probably be the one that is switched to protection.

16. If you need to cause the protection switch to move to another failed MMFG, enter **SW-TOPROTN-EQPT: :UNIT - [q]q: :MMFG - c: FRC;** for the MMFG which you want to place on protection to maintain service or to enable maintenance (see Note).

**NOTE:**

If an MMFG is in-service and failed (because another MMFG was being served by protection), plug-ins cannot be replaced and restored to service. When switched to protection, the same MMFG will be removed from service (OOS) allowing maintenance.

17. Use the ERR ESR messages for the DS3U (HDS3U) plug-ins to determine which MMFG plug-in(s) are implicated and replace the named pack(s). The implicated circuit packs have either an OOS (out-of-service) or ISF (in-service and failed) status.
18. Enter command to restore the replacement plug-in to service per Figure 4.10-1.

| <b>verb:[xy]:&lt;CP identification&gt;:[ww]{;} or {:&lt;additional info.&gt;};</b> |                               |           |                                   |
|------------------------------------------------------------------------------------|-------------------------------|-----------|-----------------------------------|
| {RMV-EQPT::                                                                        | SYNC-a;                       | a         | = 0 or 1                          |
| /RST-EQPT::                                                                        | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT::                                                                       | SYNC:[ww]:TB                  |           |                                   |
| /DGN-EQPT::                                                                        | CCI-s;                        | s         | = side 0 or 1                     |
|                                                                                    | CCNI-s;                       | s         | = side 0 or 1                     |
|                                                                                    | ETSI-sqq;                     | qq        | = unit 01-16                      |
|                                                                                    | TSI-sft;                      | f         | = unit (receiving from) (1-6)     |
|                                                                                    | CCB-sf;                       | t         | = unit (transmitting to) (1-6)    |
|                                                                                    | ETSI,S,ECCN-s;                |           |                                   |
|                                                                                    | UNIT-[q]q:[ww]:UC;            | [q]q      | = unit 01-16                      |
|                                                                                    | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = module interface 1-4            |
|                                                                                    | UNIT-[q]q:[ww]:FC-sd;         | sd        | = FC side (0,1) and FC No. (1-4)  |
|                                                                                    | UNIT-[q]q:[ww]:FLI-k;         | k         | = service (S) or protection (P)   |
|                                                                                    | UNIT-[q]q:[ww]:FMT-s;         | s         | = side (0,1)                      |
|                                                                                    | UNIT-[q]q:[ww]:MMFG-c;        | c         | = DS3 group (1-6, P)              |
|                                                                                    | [FRC][,INCL];                 | FRC       | = forces RMV with no prot. switch |
|                                                                                    |                               | INCL      | = removes/restores MXR NPCs       |
| DGN-EQPT::                                                                         | UNIT-[q]q:[ww]:MIU-c;         | c         | = DS3 group (1-6, P)              |
|                                                                                    | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = NPC No.                         |
|                                                                                    |                               | s         | = SIDE for DSPU                   |
|                                                                                    | LINK-j;                       | j         | = link 1-6                        |
|                                                                                    | UNIT-[q]q:[ww]:MXR-c;         | c         | = DS3 group (1-6, P)              |

**Figure 4.10-1. Maintenance Command Construction**

19. If you were able to clear the trouble, then continue with Step 20.
  - If you were not, then go to Section 4.3.

**NOTE:**

When the service MMFG is restored to service, the next failed MMFG will switch to protection. If only two MMFGs failed, the alarm status will change from critical to major.

**NOTE:**

If a failed MMFG cannot be switched to protection, it will be marked ISF (in-service, failed). An MMFG with ISF status cannot be removed because the protection switch is in use, and the MMFG cannot be restored (after plug-in replacement) because it is already in-service.

20. Repeat Steps 15 through 19 to clear remaining DS3 alarms.
21. Enter **RTRV-STATE-EQPT : :UNIT - [q]q : :PROTN**; to check the maintenance and protection status of each of the MMFGs.
22. If the protection switch was operated (or inhibited) manually to enable maintenance, enter the command to reverse the operation as follows:  
**Release Protection**  
**SW-TOWKG-EQPT : :UNIT - [q]q : :MMFG-c ;**  
**Allow Switching**  
**ALW-SW-EQPT : :UNIT - [q]q : :MMFG-c :PROTN ;**
23. Enter **RTRV-STATE-EQPT : :UNIT - [q]q : :ALL**; to check for failed or out-of-service plug-ins. Clear failures as follows:
  - For failed plug-ins, enter RMV command for plug-in, replace it, and enter RST command per Figure 4.10-1.

For failed facilities, check facility errors and clear counts. If NPC was removed from service, enter RST command for NPC per Figure 4.10-1.

---

## Manual Diagnostic Failures

### General Tasks

# 5

---

### Contents

|                                                         |                           |
|---------------------------------------------------------|---------------------------|
| ■ Clear Failed MC Diagnostic                            | GT <a href="#">5.1-1</a>  |
| ■ Clear Failed MP Diagnostic                            | GT <a href="#">5.2-1</a>  |
| ■ Clear Failed CI Diagnostic                            | GT <a href="#">5.3-1</a>  |
| ■ Clear Failed SYNC Diagnostic                          | GT <a href="#">5.4-1</a>  |
| ■ Clear Failed CRO Diagnostic                           | GT <a href="#">5.5-1</a>  |
| ■ Clear Failed TLI Diagnostic                           | GT <a href="#">5.6-1</a>  |
| ■ Clear Failed UNIT UC Diagnostic                       | GT <a href="#">5.7-1</a>  |
| ■ Clear Failed FTMI Diagnostic                          | GT <a href="#">5.8-1</a>  |
| ■ Clear Failed DSPI Diagnostic                          | GT <a href="#">5.9-1</a>  |
| ■ Clear Failed FC Diagnostic                            | GT <a href="#">5.10-1</a> |
| ■ Clear Failed CCI Diagnostic                           | GT <a href="#">5.11-1</a> |
| ■ Clear Failed CCNI Diagnostic                          | GT <a href="#">5.12-1</a> |
| ■ Clear Failed ETSI Diagnostic                          | GT <a href="#">5.13-1</a> |
| ■ Clear Failed TSI Diagnostic                           | GT <a href="#">5.14-1</a> |
| ■ Clear Failed NPC (FTU) Diagnostic                     | GT <a href="#">5.15-1</a> |
| ■ Clear Failed DSPU NPC Diagnostic                      | GT <a href="#">5.16-1</a> |
| ■ Primary Memory (PMEM) Card Failure Recovery Procedure | GT <a href="#">5.17-1</a> |
| ■ Clear Failed Link Diagnostic                          | GT <a href="#">5.18-1</a> |
| ■ Clear Failed CCB Diagnostic                           | GT <a href="#">5.19-1</a> |

- Clear Failed DS3 FLI or MXR Diagnostic GT [5.20-1](#)
  - Clear Failed DS3 FMT or HFMT Diagnostic GT [5.21-1](#)
-



---

**When to Use**                      Use this procedure to clear a failed MC diagnostic.

---

### **Instructions**

---

1. If alarm cutoff is needed, enter **OPR-ACO-ALL**; . 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-EQPT : :CCI-s**; (s = Side 0 or 1).
  - If the MC (main controller) was removed from service (REPT RMV EQPT ...MC), 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 5.1-1 and refer to the trouble procedure for the failed diagnostic.
5. If an REPT RMV EQPT ...MC message did not accompany the DGN MC ...STF message, enter **RMV-EQPT : :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 5.1-1.

**Table 5.1-1. Implicated MC Plug-Ins**

| <b>Trouble Number</b>                       | <b>Implicated CP</b>            | <b>Diagnostic</b> | <b>Reference</b> |
|---------------------------------------------|---------------------------------|-------------------|------------------|
| 0100                                        | MP                              | DGN-EQPT::MP;     | GT 5.2           |
| 0200                                        | CI                              | DGN-EQPT::CI;     | GT 5.3           |
| 0400                                        | PMEM                            | DGN-EQPT::PMEM;   | GT 5.15          |
| 0500                                        | SMEM                            | DGN-EQPT::SMEM;   | GT 5.16          |
| 0600, 0700,<br>0800, or 0900                | EMTC/MTC                        | None              | None             |
| 0A01, 0A02, 0A03,<br>0A04, 0A05,<br>or 0C00 | EBX/BX2                         | None              | None             |
| 0B00, 1000                                  | EBX/BX2 or<br>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:**

The terminal must be set to the default baud rate (1200 baud) to see the information as it scrolls on the screen.

**NOTE:**

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:**

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...COMPLD (with no error explanation) message is received, this procedure is completed.
  - If RESET...COMPLD (with error explanation) message is received, go to *Data Base Troubles* to clear conditional reset completion.
8. Enter **DGN-EQPT : :MC;**
- If DGN MC ...STF message is received, contact technical consultant.
-



---

**When to Use**                      Use this procedure to clear a failed MP diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is needed, enter **OPR-ACO-ALL**; .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 COMPLD or RST MC DENY in printout), enter **RMV-EQPT : :MC**;



**NOTE:**

If the remove command is entered and the MC is already out of service, the entity out of service deny message will be received.

4. Replace the CPU2 (code TM778) located in the MC.



**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button.*

**NOTE:**

The terminal must be set to the default baud rate (1200 baud) to see the information as it scrolls on the screen.

**NOTE:**

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:**

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 ...COMPLD (with no error explanation) message is received, you have completed this procedure.
  - If RESET ...COMPLD (with error explanation) message is received, refer to *Data Base Troubles* to clear conditional reset completion.
5. If trouble persists, contact technical consultant for assistance.
-

---

**When to Use**                      Use this procedure to clear a failed CI diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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-EQPT : : MC**; .



**NOTE:**

If the remove command is entered and the MC is already out of service, the entity out of service deny message will be received.

3. Replace the CI or ICI, whichever is installed, circuit pack with the same circuit pack.
4. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.



**NOTE:**

The terminal must be set to the default baud rate (9600 baud) to see the information as it scrolls on the screen.

**NOTE:**

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:**

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 GT 5.2.
    - If STARTUP STF is not received, continue with Step 7.
  7. If MC RESET COMPLD (with no error explanation) is received, you have completed this procedure.
    - If MC RESET COMPLD (with error explanation) is received, refer to *Data Base Troubles* to clear reset completed conditionally.
-



---

**When to Use**                      Use this procedure to clear a failed SYNC diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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 COMPLD or RST SYNC DENY in printout), enter **RMV-EQPT : : 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-EQPT : :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-EQPT : :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-EQPT : :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-EQPT : :SYNC-a ;** for subject sync side.
13. If trouble persists, enter **RMV-EQPT : :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-EQPT : :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-EQPT : :SYNC-a**; to restore the sync.
- 18. Enter **ENT-EQPT : :SYNC-a : :FPLL**; to initiate sync fast start.
- 19. After approximately 5 minutes, enter **RTRV-STATE-EQPT : :SYNC**; to verify that the MODE for the subject side is NORMAL. Table 5.4-1 lists the outputs for each field of the query.

**Table 5.4-1. SYNC Status Outputs**

| Message Field    | Outputs and Meanings                                                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| CFR              | MASTER or SLAVED sync configuration.                                                                                                |
| STRATUM          | STR2, STR3, CEPT TOLL, or CEPT LOCAL.                                                                                               |
| MODE             | HOLDOVER, FAST, or NORMAL for each DPLL.                                                                                            |
| SOURCE           | 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-EQPT : :UNIT-[q]q : :FC-sb**;  
Where: sb = FC number which consists of side (s) and unit module (b).
- 21. Enter **RTRV-STATE-EQPT : : :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 5.4-1 for the pack.
  - If command denial occurs, find the reason for denial in the output message.

**NOTE:**

When a CP fails in the sync, ECCN/CCN, DSPU, DS3U, or HDS3U, 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 5.4-1 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 **RTRV - STATE - EQPT : : [UNIT - [q]q] : : ALL ;**.
25. If any CPs are still pested, enter the commands to first remove and then restore the CPs per Figure 5.4-1.

If command denial occurs, find the reason for denial in the output message.

verb:[xy]:<CP identification>:[ww]{;} or {:<additional info.>;}

|              |                            |   |   |                             |
|--------------|----------------------------|---|---|-----------------------------|
| {RMV-EQPT::  | SYNC-a;                    | a | = | 0 or 1                      |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b]; | n | = | 1-4; b = sync port (0 or 1) |
| /DISC-EQPT:: | SYNC:[ww]:TB               |   |   |                             |
| /DGN-EQPT::  | CCI-s;                     | s | = | side 0 or 1                 |
|              | CCNI-s;                    | s | = | side 0 or 1                 |

|                                  |           |   |                                 |
|----------------------------------|-----------|---|---------------------------------|
| ETSI-sqq;                        | qq        | = | unit 01-16                      |
| TSI-sft;                         | f         | = | unit (receiving from) (1-6)     |
| CCB-sf;                          | t         | = | unit (transmitting to) (1-6)    |
| ETSI, ECCN-s;                    |           |   |                                 |
| UNIT-[q]q:[ww]:UC;               | [q]q      | = | unit 01-16                      |
| UNIT-[q]q:[ww]:{FTMI-d DSPI};    | d         | = | module interface 1-4            |
| UNIT-[q]q:[ww]:FC-sd;            | sd        | = | FC side (0,1) and FC No. (1-4)  |
| UNIT-[q]q:[ww]:FLI-k;            | k         | = | service (S) or protection (P)   |
| UNIT-[q]q:[ww]:FMT-s;            | s         | = | side (0,1)                      |
| UNIT-[q]q:[ww]:MMFG-c;           | c         | = | DS3 group (1-6, P)              |
| [FRC],[INCL];                    | FRC       | = | forces RMV with no prot. switch |
|                                  | INCL      | = | removes/restores MXR NPCs       |
| UNIT-[q]q:[ww]:MIU-c;            | c         | = | DS3 group (1-6, P)              |
| NPC-<npc No.>:[ww]:[SIDE-s];     | <npc No.> | = | NPC No.                         |
|                                  | s         | = | SIDE for DSPU                   |
| LINK-j;                          | j         | = | link 1-6                        |
| DGN-EQPT:: UNIT-[q]q:[ww]:MXR-c; | c         | = | DS3 group (1-6, P)              |

**Figure 5.4-1. Maintenance Command Construction**

|                                     |           |   |                                |
|-------------------------------------|-----------|---|--------------------------------|
| 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 ETISs 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                       |



---

## Clear Failed CRO Diagnostic

# 5.5

---

**When to Use**                      Use this procedure to clear a failed CRO diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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 COMPLD in printout), enter **RMV-EQPT : : 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-EQPT : : 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-EQPT : : 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 create command as follows:  
  
**RMV-EQPT::TLI-3::CRO;** to remove additional TB pack from service.  
**DISC-EQPT::SYNC::TLI-3;** to degrow the additional TB.  
Enter command to regrow same TB with same type field as the TBs on the sides, **CRTE-EQPT::SYNC::TBpqr:TLI-3;**  
Wait 30 minutes for TB oven to reach temperature and then enter **RST-EQPT::TLI-3::CRO;**
  - If the CRO was equipped correctly, contact technical consultant for assistance.
-



---

**When to Use**                      Use this procedure to clear a failed TLI diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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 COMPLD or RST TLI DENY in printout), enter **RMV-EQPT::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 entity out of service denial message will be received.

5. Replace the subject TLI pack with the same code as the original.
6. Enter **DGN-EQPT::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-EQPT::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-EQPT::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

# 5.7

---

### When to Use

Use this procedure to clear a failed UNIT UC diagnostic.

---

### Instructions

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If failed unit UC is in a DS3 unit, continue with Step 3.
  - If failed unit UC is not in a DS3 unit, proceed to Step 6.
3. Enter **RTRV-STATE-EQPT::UNIT-[q]q:PROTN**; and determine which FLI (S or P) is selected. The selected one will have SLT under the heading for it in the FLI portion of the message.

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



#### NOTE:

Steps 4 and 5 are needed to prevent unnecessary transmission hits caused by repeated operation of the FLI protection switching when the unit UC is removed and restored.

4. Which FLI is selected?
  - If **FLI P**, continue with Step 5.

- If **FLI S**, proceed to Step 6.
5. Enter **RMV-EQPT::UNIT-[q]q::FLI-s;**  
to remove FLI S from service.
    - If the remove is denied (COND 11 DNY), the FLI S can be disconnected (that is, if FLI S is selected and the unit UC is out of service so that the FLI can be eventually restored) to prevent transmission hits.  
  
If the FLI S is failed (DGN FLI S STF in the trouble printout), also replace it while the unit UC is out of service. The preferred configuration is to have FLI S selected because reset/reboot operations revert to that configuration.
  6. If the UC (unit controller) has not been removed from service (as shown by previous **RMV UC COMPLD** or **RST UC DENY** in printout), enter **RMV-EQPT::UNIT-[q]q::UC;**

**NOTE:**

If the remove command is entered and the unit UC is already out of service, the entity out of service denial message will be received.

7. 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 9.
  - If other trouble number is received, continue with Step 8.
8. Which unit is affected?
  - If IFTU, or DSPU, replace the CPU2 (TM778) for the unit.
  - If DS3U or HDS3U, replace the UC (KER2 code) for the unit.
9. Enter **RST-EQPT::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 reason for denial in the output message.

10. If FLI S was removed from service (or disconnected) in this procedure, (install the plug-in and) enter **RST-EQPT: :UNIT-[q]q: :FLI-S;** to restore FLI S to service.
-



---

**When to Use**                      Use this procedure to clear a failed FTMI diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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-EQPT : :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 COMPLD or RST FTMI DENY in printout), enter **RMV-EQPT : :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-EQPT : :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-EQPT : :UNIT - [q]q : UC ;**  
Where: [q]q = Unit number (1 through 16).
  10. Replace UBX (UM28 code).
  11. Enter **RST-EQPT : :UNIT - [q]q : UC ;**.
  12. Enter **RST-EQPT : :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

# 5.9

---

**When to Use**                      Use this procedure to clear a failed DSPI diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL;**. 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 **RTRV-STATE-COM:::ALL;**  
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 COMPLD or RST DSPI DENY in printout), enter **RMV-EQPT::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-EQPT::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 ...COMPLD message is received, this procedure is completed.
  - If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action to obtain command completion.
-

---

**When to Use**                      Use this procedure to clear a failed FC diagnostic.

---

### **Instructions**

---



**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 the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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 **RTRV-REG-EQPT: :SYNC-a: :STR**; (a = Side 0 or 1), and see Figure 5.10-1.

**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-EQPT : :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 COMPLD or RST FC DENY), enter **RMV-EQPT : :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-EQPT : :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.

/\*STR:b01,b02,b03,b04,b05,b06\*/

"STR:byte1,byte2,byte3,byte4,byte5,byte6"

**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<br>010 for 2-Mb/s toll, 011 for stratum 2 |

**Figure 5.10-1. 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-EQPT : :ETSI-sqq;.**  
**RMV-EQPT : :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-EQPT : :ETSI-sqq;.**  
**RST-EQPT : :CCB-sf;.**
12. Enter **DGN-EQPT : :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-EQPT: :UNIT- [q]q: :UC; .**
  14. Replace the UBX (UM28 code) for the subject unit.
  15. Enter **RST-EQPT: :UNIT- [q]q: :UC;** for the subject unit.
  16. Enter **RST-EQPT: :UNIT- [q]q: :UC;** 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 5.10-1, 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 5.10-2.
  19. Enter **RST-EQPT: :UNIT- [q]q: :UC; !** for the subject unit and FC.

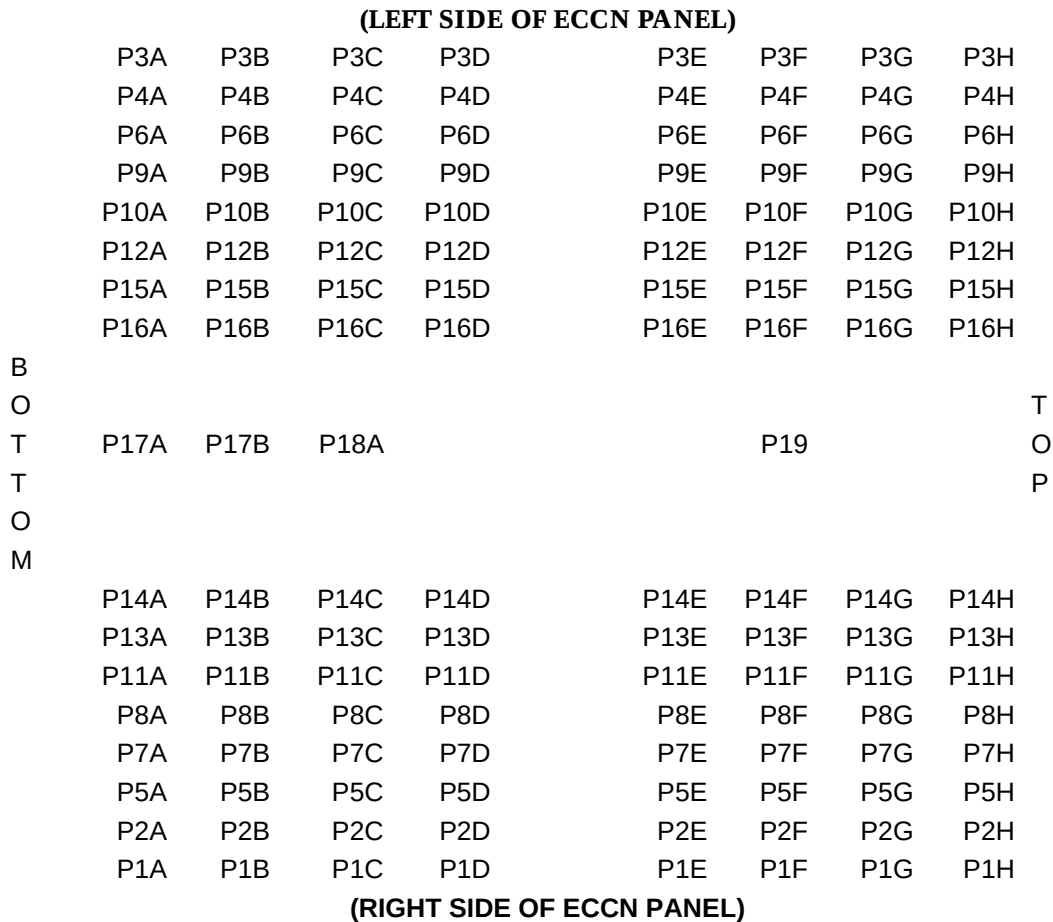
**NOTE:**

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 5.10-1. Cable Identification**

| <b>Unit Plug<br/>(Flex Bay)</b> | <b>Unit Plug<br/>(Orig. Bay)</b> | <b>ECCN Plug</b> | <b>Direction</b> | <b>Involved<br/>FC</b> |
|---------------------------------|----------------------------------|------------------|------------------|------------------------|
| 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                  |

B  
O  
T  
T  
O  
MT  
O  
P

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**Figure 5.10-2. Cable Connectors on ECCN Panel**

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**When to Use**                      Use this procedure to clear a failed CCI diagnostic.

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### **Instructions**

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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 the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . 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 COMPLD or RST CCI DENY in printout), enter **RMV-EQPT : : 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-EQPT: :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-EQPT: :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-EQPT: :MC**;

13. Disconnect and reseal 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-EQPT: :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 reseated.
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-EQPT: :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-EQPT: :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-EQPT: :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-EQPT: :ETSI-sqq;** for that pack.
26. Enter **DGN-EQPT: :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-EQPT: :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 **RTRV-STATE-EQPT: : :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.

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**When to Use**                      Use this procedure to clear a failed CCNI diagnostic.

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### **Instructions**

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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 the alarm cutoff is not already operated, enter **OPR-ACO-ALL**; . If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. If the CCNI has not been removed from service (RMV CCNI COMPLD or RST CCNI DENY in printout), enter **RMV-EQPT : :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-EQPT : :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-EQPT : 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 5.12-1 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-EQPT : 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-EQPT : 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, **ST-EQPT : TSI-sft ;** or **RST-EQPT : 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 **RTRV-STATE-EQPT : : [UNIT-q] : : 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.

| SINGLE CHARACTER |  | DATA 1 (ESR1, TSI FROM, TO UNIT ID)            |               |               |               |
|------------------|--|------------------------------------------------|---------------|---------------|---------------|
| VALUE            |  | 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         |





## Clear Failed ETSI Diagnostic

# 5.13

## When to Use

Use this procedure to clear a failed ETSI diagnostic.

## Instructions

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 not already operated, enter **OPR-ACO-ALL**; . 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 COMPLD or RST ETSI DENY in printout), enter **RMV-EQPT: :ETSI-sqq**;

Where: sqq = Failed ETSI number consisting of the side (s) and unit number (qq) that it serves.

- To avoid the possibility of alarms on ETSI ports, enter command to remove service from side with failed ETSI, **RMV-EQPT::CCI-s<sub>i</sub>** (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-EQPT : CCI-s**; (s = side).
6. Enter **DGN-EQPT : ETSI-sqq**;
  - If DGN ...STF message is received, continue with Step 7.
  - If DGN ...STF message is not received, enter **RST-EQPT : ETSI-sqq;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.
  - For FMT, a 1 in any of the 8 bits indicates the FMT for the side.

- For DSPU NPC, each bit (in the 8-bit number) represents one of the DSPs in the unit (**the odd bits are for the even DSPs and the even bits are for the odd DSPs**) as follows:

|                |                |
|----------------|----------------|
| bit 2 is DSP 1 | bit 1 is DSP 2 |
| bit 4 is DSP 3 | bit 3 is DSP 4 |
| bit 6 is DSP 5 | bit 5 is DSP 6 |
| bit 8 is DSP 7 | bit 7 is DSP 8 |

11. If any ports are alarmed, enter the RMV-EQPT command for the suspect pack per Figure 5.13-1 and reseal the same pack. Enter commands to restore the subject ETSI (for timing to unit) and the suspect pack.

If DSPU NPC is to be replaced, remove the side from service before doing replacement (**RMV-EQPT::CCI-s;**). Restore side to service after replacement (**RST-EQPT::CCI-s;**).

verb:[xy]:<CP identification>:[ww]{} or {}:<additional info.>;

|              |                               |           |   |                                 |
|--------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::  | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::  | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT:: | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::  | CCI-s;                        | s         | = | side 0 or 1                     |
|              | CCNI-s;                       | s         | = | side 0 or 1                     |
|              | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|              | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|              | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|              | ETSI-S,ECCN-s;                |           |   |                                 |
|              | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|              | UNIT-[q]q:[ww]:{FTMI-d DSPi}; | d         | = | module interface 1-4            |
|              | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|              | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|              | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|              | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|              | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|              |                               | INCL      | = | removes/restores MXR NPCs       |
|              | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|              | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|              |                               | s         | = | SIDE for DSPU                   |
|              | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::   | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

---

**Figure 5.13-1. Maintenance Command Construction**

12. If either a DGN ...STF or RST ...DENY message is received, enter command to remove the suspect pack, replace it, and enter the command to restore it to service.
13. Enter **DGN-EQPT : :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-EQPT : :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-EQPT : :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-EQPT : :CCI-s;** . .
18. Enter **DGN-EQPT : :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-EQPT : :ETSI-sqq;** for the subject ETSI pack.
19. If there is another pack listed in Table 5.13-1 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 5.13-1, 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-EQPT : :CCI-s ;**). Restore the side after the replacement (**RST-EQPT : :CCI-s ;**).

Repeat from Step **18**.

**Table 5.13-1. Implicated Plug-Ins**

| <b>Trouble No.</b>                             | <b>Plug-Ins</b>                   | <b>Commands</b>                                                                |
|------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------|
| 0001                                           | ETSI<br>CCI<br>DPLL (in sync)     | {RMV RST}-EQPT::ETSI-sqq;<br>{RMV RST}-EQPT::CCI-s;<br>{RMV RST}-EQPT::SYNC-a; |
| 0002, 0010, 0020, 0040,<br>0100, 0200, or 0800 | ETSI                              | {RMV RST}-EQPT::ETSI-sqq;                                                      |
| 0004                                           | ETSI<br>CCI<br>EBX (in MC)<br>BTs | {RMV RST}-EQPT::ETSI-sqq;<br>{RMV RST}-EQPT::CCI-s;<br>RMV-EQPT::MC;           |
| 0008, 0400, or 8000                            | ETSI<br>CCI                       | {RMV RST}-EQPT::ETSI-sqq;<br>{RMV RST}-EQPT::CCI-s;                            |
| 0080 or 1000                                   | ETSI<br>BTs                       | {RMV RST}-EQPT::ETSI-sqq;                                                      |

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.

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-EQPT::ETSI-sqq;**.
24. Enter **RMV-EQPT::CCI-s;** to remove the side from service. Replace the ETSI.
25. Enter **RST-EQPT::CCI-s;** to restore the side to service.
26. Enter **DGN-EQPT::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-EQPT::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-EQPT : :ETSI -sqq**; for the original ETSI. Repeat as necessary for each of the suspect ETSIs.

**NOTE:**

To prevent alarms, remove the side before replacing ETSI (**RMV-EQPT : :CCI -s**;). After replacement, restore the side to enable ETSI diagnostic and restoral (**RST-EQPT : :CCI -s**;).

**NOTE:**

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-EQPT : :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 5.13-1 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 5.13-1, 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.

To prevent alarms, remove the side before replacing an ECCN plug-in (**RMV-EQPT : :CCI-s ;**). Restore the side after the replacement (**RST-EQPT : :CCI-s ;**).

34. Enter **DGN-EQPT : :ETSI-sqq ;**.

- If DGN ...STF message is received, repeat from Step 32.
- If DGN ...STF message is not received, enter **RST-EQPT : :ETSI-sqq ;** for the subject ETSI pack.



---

**When to Use**                      Use this procedure to clear a failed TSI diagnostic.

---

### **Instructions**

---

1. If the alarm cutoff is not already operated, enter **OPR-ACO-ALL**.
2. If the subject TSI (time slot interchange) has not been removed from service (RMV TSI COMPLD or RST TSI DENY in printout), enter **RMV-EQPT::TSI-sft;**

Where: sft    =    Failed TSI number.

3. Replace the TSI pack (TM660 code) named in the failed diagnostic message.
4. Enter **DGN-EQPT::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-EQPT : : CCNI - s ;**  
where: s = Side (0 or 1).
  7. Replace that CCNI pack (UM30 code).
  8. Enter **RST-EQPT : : CCNI - s ;**.
  9. Enter **DGN-EQPT : : 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-EQPT : : TSI - sft ;**
    - If trouble persists, contact technical consultant.
-

---

## Clear Failed NPC (FTU) Diagnostic

# 5.15

---

### When to Use

Use this procedure to clear a failed NPC (FTU) diagnostic.

---

### Instructions

---

1. If the alarm cutoff is needed, enter **OPR-ACO-ALL;**. If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Enter **DGN-EQPT: :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 **RTRV-REG-EQPT: :XC-a: :STR;** for each side (a = 0,1) and determine the active side from output (rightmost data byte equals 05 for in-service and active).

- Enter **RTRV-STATE-COM:[xy]::[ww]:ALL;**  
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 **SW-DX-EQPT: :XC-a;** (for inactive side) to switch ECCN sides.
4. Enter **DGN-EQPT: :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-EQPT: :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-EQPT: :UNIT-[q]q: :FC-sb;**.
  6. At low traffic time, enter **SW-DX-EQPT: :XC-a;** (for inactive side) to switch to other ECCN side.
  7. Enter **DGN-EQPT: :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-EQPT: :ETSI-sqq;** replace the ETSI pack, and enter **RST-EQPT: :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-EQPT: :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, DDC) can be removed from service, enter command to remove the other NPC as follows:  
**RMV-EQPT::NPC-<npc No.>::[:INCL];**.

Where:

<npc No.> = NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).

INCL = Optional, needed to remove NPC with red circuits and CUS circuits. Enter

**PTRV-PRMTR-T1::<npc No.>::MARK;**  
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-EQPT::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 ...COMPLD message is received, this procedure is completed.
- If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action to obtain command completion.



---

### When to Use

Use this procedure to clear a failed DSPU NPC diagnostic.

---

### Instructions

---



**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 **OPR-ACO-ALL**; .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:**

Each DSP position consists of a pair of NPCs and the pair is addressed in commands by the first NPC of the pair.

3. If the subject NPC has not been removed from service RMV COMPLD or RST DENY in printout), enter  
**RMV-EQPT::NPC-<npc No.>::SIDE-s[:INCL];**  
Where:  

|           |   |                                                                                                                     |
|-----------|---|---------------------------------------------------------------------------------------------------------------------|
| <npc No.> | = | NPC number, either extended (for example, [0]001) or hierarchical (for example, 01-1-01).                           |
| s         | = | Side (0 or 1).                                                                                                      |
| INCL      | = | Optional, needed to remove NPC with cross-connected red circuits, and substrate circuits with established channels. |
4. Enter **DGN-EQPT::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-EQPT::CCI-s;** or **RMV-EQPT::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-EQPT::CCI-s;** or **RST-EQPT::CCNI-s;** (whichever is appropriate) to restore the network side to service.
8. Enter **DGN-EQPT::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-EQPT::UNIT-[q]q::DSPI;**, replace DSPI, and enter **RST-EQPT::UNIT-[q]q::DSPI;**.
10. Enter **DGN-EQPT::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-EQPT::UNIT-[q]q::UC;**, replace CPU, and enter **RST-EQPT::UNIT-[q]q::UC;**.
12. Enter **DGN-EQPT::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-EQPT::ETSI-sqq**; or **RMV-EQPT::TSI-sft**; ,replace the ETSI/TSI pack, and enter **RST-EQPT::ETSI-sqq**; or **RST-EQPT::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-EQPT::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-EQPT::NPC-<npc No.>::SIDE-s**; for the first NPC (if NPC pair) and side.
- If RST ...COMPLD message is received, this procedure is completed.
  - If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action.
16. From Table 5.16-1, 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 4-1. 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        |

**Table 4-1. Cable Identification**

| Unit Plug | ECCN Plug | Side | Direction | Involved DSP Plug-In |
|-----------|-----------|------|-----------|----------------------|
| 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 5.16-1
18. Enter **RST-EQPT::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 ...COMPLD message is received, this procedure is completed.

If RST ...DENY message is received, find the reason for denial in the output message and perform corrective action.

|                                   |      |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|------|
| <b>(LEFT SIDE OF ECCN PANEL)</b>  |      |      |      |      |      |      |      |
| 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 |
|                                   |      |      |      |      |      |      |      |
| 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  |
| <b>(RIGHT SIDE OF ECCN PANEL)</b> |      |      |      |      |      |      |      |

B  
O  
T  
T  
O  
MT  
O  
P

---

**Figure 5.16-1. Cable Connectors on ECCN Panel**

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## Primary Memory (PMEM) Card Failure Recovery Procedure

# 5.17

---

**When to Use**                      Use this procedure to recover from a primary memory (PMEM) card failure.

---

### **Instructions**

---

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 5.17-1 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-EQPT: :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.



**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing 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 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.

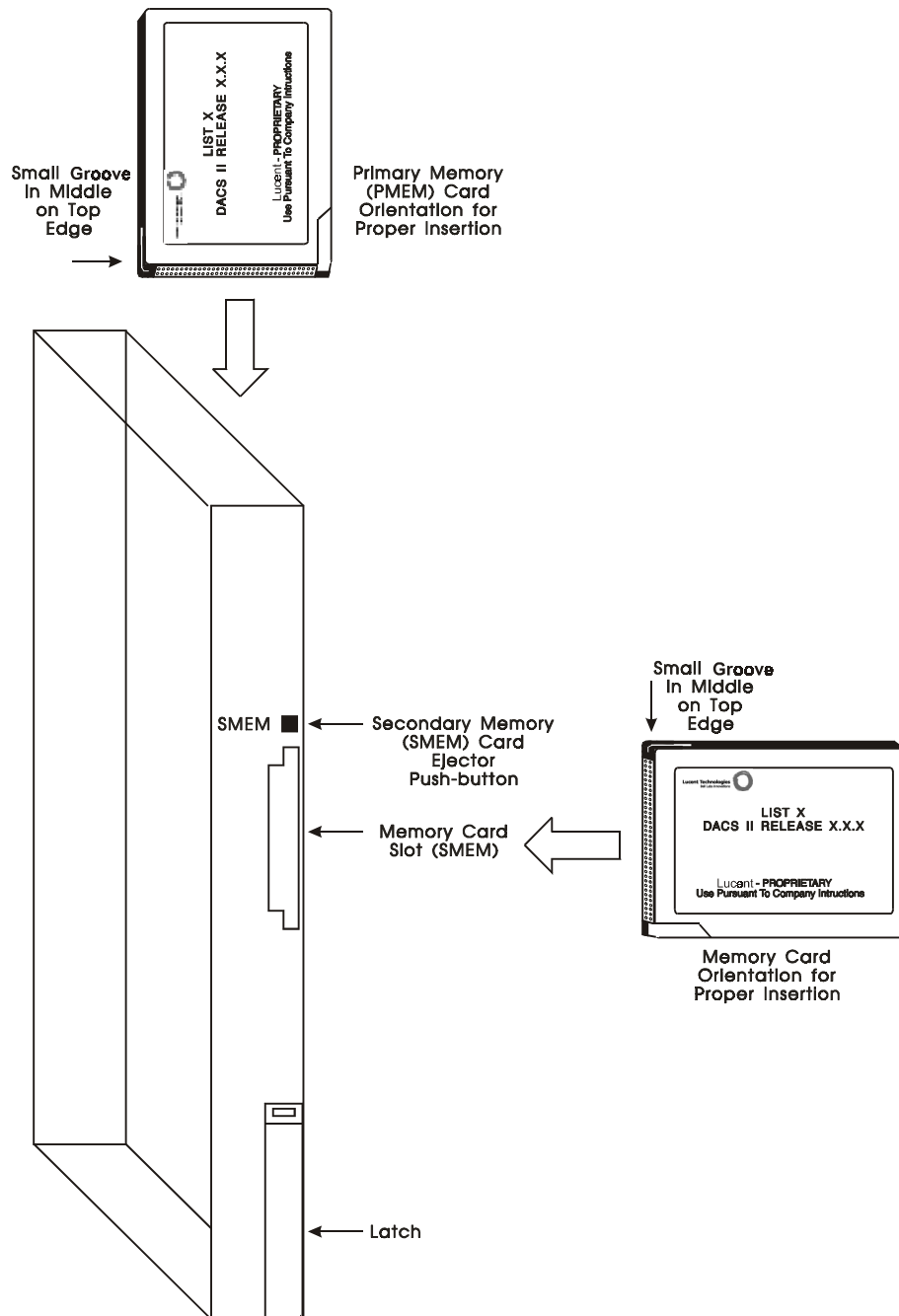


Figure 5.17-1. Memory Card Locations on CPU2

3. Replace the PMEM card (Figure 5.17-1) 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-EQPT: :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.



**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing 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 7. (The old PMEM card may be recycled as a future SMEM card.)
4. Replace the PMEM card (Figure 5.17-1) 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-EQPT: :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.



**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing 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 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-EQPT::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-EQPT::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-EQPT::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).
-



---

**When to Use**                      Use this procedure to clear a failed link diagnostic.

---

### **Instructions**

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1. If the alarm cutoff is needed, enter **OPR-ACO-ALL**; .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-EQPT : : 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 or ICI must be replaced.

5. If DGN LINK ...STF message is received for any other link, enter **RMV-EQPT::MC;**.
    - If DGN LINK ...STF message is not received for any other link, proceed to Step 8.
  6. Replace the CI or ICI 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 or ICI 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.
-

---

**When to Use**                      Use this procedure to clear a failed CCB diagnostic.

---

### **Instructions**

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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 needed, enter **OPR-ACO-ALL**; .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 COMPLD or RST CCB DENY in printout), enter **RMV-EQPT : :CCB-sf**;

Where:

s    =    Side (0 or 1)  
f    =    CCB number (1 through 6).

3. Enter **RMV-CNFGRN-EQPT : :UNIT-q : :CCN-s, TSIS**; 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-EQPT: :CCB-sf;** for the subject CCB.
6. Enter **RST-EQPT: :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-EQPT: :CCB-sf;**
  - If DGN ...STF message is not received, proceed to Step 15.
9. Enter **RMV-EQPT: :CCNI-s;** where: s = failed side (0 or 1).
10. Replace the CCNI pack (UM30 code) for the same CCN side.
11. Enter **RST-EQPT: :CCNI-s;** where: s = side 0 or 1.
12. Enter **DGN-EQPT: :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 located under the error analysis heading in 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 5.19-1 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 5.19-1. TSI Ports on CCB**

| Byte             | Specific Position Value | TSI From-Unit ID |
|------------------|-------------------------|------------------|
| ESR0<br>(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<br>(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<br>(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-EQPT::TSI-sft**; for that TSI, replace it, and enter **RST-EQPT::TSI-sft**;
15. Enter **RST-EQPT::CCB-sf**; for the subject CCB.

16. Enter **RTRV-STATE-EQPT::UNIT-q::OOS;** and **RTRV-STATE-COM:::OOS;** 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-EQPT::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-CNFG-RN-EQPT:[xy]:UNIT-q:[ww]:CCN-s, TSIS;** for the subject side and unit; otherwise, enter command to restore each TSI as follows, **RST-EQPT::TSI-sft;.**
-

---

## Clear Failed DS3 FLI or MXR Diagnostic

# 5.20

---

**When to Use**      Use this procedure to clear a failed DS3 FLI or MXR diagnostic.

---

### Instructions

---



**NOTE:**

This procedure is used primarily for diagnostic failures encountered during turnup (service restoral denied). Almost always, the failed diagnostic implicates the subject pack, but an associated DS3 plug-in can also be implicated. These associated plug-ins are named in the error recovery ANALYSIS REPORT for in-service failures.

1. If the alarm cutoff is needed, enter **OPR-ACO-ALL**; .If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Enter **RTRV-STATE-EQPT::UNIT-[q]q::PROTN**;  
([q]q = unit 1 through 16) and use Table 5.20-1 to determine the protection status of the packs.



**NOTE:**

The output message reads as follows: (1) the protection MMFG is listed first on the left, and (2) for each MMFG, the top code is the MXR maintenance status, next down is the MIU (if any) status, next is the MMFG protection status, and last, the protection availability.

**NOTE:**

When there is service on the DS3U or HDS3U, forcing the removal of an entity by the use of MMFG FRC keyword or removing MMFG service to enable FLI removal could result in loss of service.

3. If the subject entity has not been removed from service (RMV COMPLD or RST DENY in printout), enter required RMV-EQPT command for that failed entity per Figure 5.20-1. Remove MMFG for failed MXR.

**NOTE:**

The removal of an MMFG (for MXR or HMXR) or FLI will cause a protection switch. If protection is not available, the RMV-EQPT command will be denied.

**NOTE:**

If the mate FLI is out-of-service, the remaining FLI can only be removed if all the following are true: no NPCs grown on MXR or HMXR, no service MXRs or HMXRs grown, protection MIU not grown, and no MMFGs in-service.

| Keyword                   | Meaning                                                       |
|---------------------------|---------------------------------------------------------------|
| <b>Maintenance Status</b> |                                                               |
| IS                        | In-Service                                                    |
| ISF                       | In-Service, but Failed and Pested                             |
| OOS                       | Out-Of-Service                                                |
| UEQD                      | Unequipped                                                    |
| <b>Protection Status</b>  |                                                               |
| 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                                     |

| Keyword                 | Meaning                       |
|-------------------------|-------------------------------|
| Protection Availability |                               |
| AVL                     | Available for Switching       |
| NVL                     | Not Available for Switching   |
| (dashes)                | MMFG Not Selected for Service |

4. Replace the plug-in named in the failed diagnostic message.
5. Enter the DGN-EQPT command for the same plug-in per Figure 5.20-1. The NPCs on an MXR or HMXR are diagnosed when the MXR or HMXR is diagnosed.
  - If DGN ...STF message is received, continue with Step 6.
  - If DGN ...STF message is not received, enter RST-EQPT command for subject pack per Figure 5.20-1. For MXR or HMXR, restore MMFG. This procedure is completed.

| <b>verb:[xy]:&lt;CP identification&gt;:[ww]{;} or {:&lt;additional info.&gt;};</b> |                               |           |   |                                 |
|------------------------------------------------------------------------------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::                                                                        | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::                                                                        | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT::                                                                       | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::                                                                        | CCI-s;                        | s         | = | side 0 or 1                     |
|                                                                                    | CCNI-s;                       | s         | = | side 0 or 1                     |
|                                                                                    | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|                                                                                    | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|                                                                                    | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|                                                                                    | ETSI,ECCN-s;                  |           |   |                                 |
|                                                                                    | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|                                                                                    | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = | module interface 1-4            |
|                                                                                    | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|                                                                                    | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|                                                                                    | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|                                                                                    | UNIT-[q]q:[ww]:MMFG-c:        | c         | = | DS3 group (1-6, P)              |
|                                                                                    | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|                                                                                    |                               | INCL      | = | removes/restores MXR NPCs       |
|                                                                                    | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|                                                                                    | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|                                                                                    |                               | s         | = | SIDE for DSPU                   |
|                                                                                    | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::                                                                         | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**NOTE:** Removing the NPC is service affecting.

---

#### Figure 5.20-1. Maintenance Command Construction

6. If you are working with either a failed MXR (HMXR) or MIU diagnostic, continue with Step 8.
7. If you are not working with either of those diagnostics, there is an obscure problem; contact technical consultant.

8. Locate the trouble number which appears immediately after STF in the diagnostic message.
  9. If you have the following trouble number: 0010 (for DGN MXR (HMXR)), 0300 (for DGN MIU), or 0301 (for DGN MIU), continue with Step **10**.
    - If you do not have one of those trouble numbers, there is an obscure problem; contact technical consultant.
  10. If you have MXR (HMXR) trouble number 0010, determine from PSTATE query which FLI is SLT (selected). Enter RMV-EQPT command for the selected FLI per Figure 5.20-1. This will cause any service to switch to the mate FLI and allow you to replace the implicated FLI.
  11. If you have MIU trouble number 0300 or 0301, enter the RMV-EQPT command for the associated MMFG per Figure 5.20-1. This will cause any service to switch to the mate MMFG and allow you to replace the implicated MXR (HMXR).
  12. Replace the implicated pack and enter the RST-EQPT command for the same plug-in per Figure 5.20-1. If MXR (HMXR) was replaced, restore the MMFG for the MXR (HMXR).
  13. Enter DGN command for the original failed plug-in per Figure 5.20-1.
    - If DGN ...STF message is received, there is an obscure problem; contact technical consultant.
    - If DGN ...STF message is not received, continue with Step **14**.
  14. Enter RST-EQPT command for subject pack per Figure 5.20-1. For MXR (HMXR), restore MMFG.
    - If RST ...COMPLD message is received, this procedure is completed.
    - If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
-





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## Clear Failed DS3 FMT or HFMT Diagnostic

# 5.21

---

### When to Use

Use this procedure to clear a failed DS3 FMT or HFMT diagnostic.

---

### Instructions

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**NOTE:**

The FMT (HFMT) diagnostic runs continuity tests between the DS3U (HDS3U) 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 the alarm cutoff is needed, enter **OPR-ACO-ALL**; .If the command is ineffective, press the **ACO** button on the DACS II status panel.
2. Check the trouble printout for ERR ESR messages and RMV COMPLD messages.

**NOTE:**

When the FMT (HFMT) fails and is removed from service, service is switched to the other side of the CCN/ECCN and to the FMT (HFMT) pack on the other side.

**NOTE:**

If the FMT (HFMT) on one side is already failed and the FMT (HFMT) on the remaining side fails, that remaining FMT (HFMT) will not be removed from service (COND 19 DNY). It will be pested. The first failure must be cleared to allow the other FMT (HFMT) to be removed.

3. If the subject entity has not been removed from service (RMV COMPLD in printout), enter required RMV-EQPT **RMV-EQPT : :UNIT-qq : :FMT-s ;** (where qq is the unit number and s is the FMT (HFMT) side).
  - If remove command was denied (COND 19), continue this procedure with the FMT (HFMT) on the other side which has been removed from service.
4. Replace the FMT (HFMT) named in the failed diagnostic message. To obtain the coordinate location of the FMT (HFMT) in the frame, enter **RTRV-LOC-EQPT : :UNIT-[q]q : :FMT-s ;**.
5. Enter **DGN-EQPT : :UNIT-qq : :FMT-s ;** for the same FMT plug-in.
  - If DGN ...STF message is received, continue with Step 6.
  - If DGN ...STF message is not received, enter **RST-EQPT : :UNIT-qq : :FMT-s ;** to restore the subject FMT (HFMT) to service. This procedure is completed.
  - If DGN DNY (or CATP) is received because continuity tests were omitted (see Table 5.21-1, proceed to Step 11.
6. If the DGN FMT (HFMT) message shows trouble number STF 0F05 or 0F07 and an optional second line with UPN and XPN numbers, proceed to Step 12.
  - If the DGN FMT (HFMT) message shows trouble number STF 0F0D, proceed back to Step 4 and replace the FMT (HFMT) pack.
  - If the message does not show those trouble numbers, continue with Step 7.
7. If there is an ESR ANALYSIS REPORT message which lists other suspect plug-ins, continue with Step 8.
  - If there is not an ESR ANALYSIS REPORT with other plug-ins, there is an obscure problem; contact technical consultant.
8. Enter the command to remove the plug-in listed in the ESR ANALYSIS REPORT from service per Figure 5.21-1 and replace that plug-in.
9. Enter the command to restore the same plug-in (from above) to service per Figure 5.21-1.

| <b>verb:[xy]:&lt;CP identification&gt;:[ww]{} or {}:&lt;additional info.&gt;}</b> |                               |           |   |                                 |
|-----------------------------------------------------------------------------------|-------------------------------|-----------|---|---------------------------------|
| {RMV-EQPT::                                                                       | SYNC-a;                       | a         | = | 0 or 1                          |
| /RST-EQPT::                                                                       | SYNC-a:[ww]:TLI-n[:SSP-b];    | n         | = | 1-4; b = sync port (0 or 1)     |
| /DISC-EQPT::                                                                      | SYNC:[ww]:TB                  |           |   |                                 |
| /DGN-EQPT::                                                                       | CCI-s;                        | s         | = | side 0 or 1                     |
|                                                                                   | CCNI-s;                       | s         | = | side 0 or 1                     |
|                                                                                   | ETSI-sqq;                     | qq        | = | unit 01-16                      |
|                                                                                   | TSI-sft;                      | f         | = | unit (receiving from) (1-6)     |
|                                                                                   | CCB-sf;                       | t         | = | unit (transmitting to) (1-6)    |
|                                                                                   | ETSI-s,ECCN-s;                |           |   |                                 |
|                                                                                   | UNIT-[q]q:[ww]:UC;            | [q]q      | = | unit 01-16                      |
|                                                                                   | UNIT-[q]q:[ww]:{FTMI-d DSPI}; | d         | = | module interface 1-4            |
|                                                                                   | UNIT-[q]q:[ww]:FC-sd;         | sd        | = | FC side (0,1) and FC No. (1-4)  |
|                                                                                   | UNIT-[q]q:[ww]:FLI-k;         | k         | = | service (S) or protection (P)   |
|                                                                                   | UNIT-[q]q:[ww]:FMT-s;         | s         | = | side (0,1)                      |
|                                                                                   | UNIT-[q]q:[ww]:MMFG-c;        | c         | = | DS3 group (1-6, P)              |
|                                                                                   | [FRC][,INCL];                 | FRC       | = | forces RMV with no prot. switch |
|                                                                                   |                               | INCL      | = | removes/restores MXR NPCs       |
|                                                                                   | UNIT-[q]q:[ww]:MIU-c;         | c         | = | DS3 group (1-6, P)              |
|                                                                                   | NPC-<npc No.>:[ww]:[SIDE-s];  | <npc No.> | = | NPC No.                         |
|                                                                                   |                               | s         | = | SIDE for DSPU                   |
|                                                                                   | LINK-j;                       | j         | = | link 1-6                        |
| DGN-EQPT::                                                                        | UNIT-[q]q:[ww]:MXR-c;         | c         | = | DS3 group (1-6, P)              |

**Figure 5.21-1. Maintenance Command Construction**

10. Enter **DGN-EQPT : UNIT-qq : FMT-s ;** for the same FMT (HFMT) plug-in.
  - If DGN ...STF message is received, there is an obscure problem; contact technical consultant.
  - If DGN ...STF message is not received, enter **RST-EQPT : UNIT-qq : FMT-s ;** to restore the subject FMT to service. This procedure is completed.

11. Refer to Table 5.21-1 and, if diagnostic continuity tests must be run, perform corrective action per the table. Repeat Step **10** to reenter diagnostic.

**Table 5.21-1. Cable Test Denial Codes**

| <b>Code</b> | <b>Explanation</b>                                                                           | <b>Corrective Action</b>                                                                                                             |
|-------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| C3          | Cable tests are not run when CFT code is included in DGN command.                            | Reenter command without CFT code.                                                                                                    |
| C4          | Cable tests cannot be run if all ETSI time slots are mapped.                                 | Verify that ETSI for unit is installed/in-service. Cross-connections would have to be disconnected from the unit to run cable tests. |
| C5          | No available NPCs in unit to run tests                                                       | At least one NPC in the unit must be installed/in-service to run tests. Grow and restore NPC if necessary.                           |
| C6          | No available time slots on in-service NPCs.                                                  | Either another NPC must be added or cross-connections must be disconnected from the unit.                                            |
| C7          | No available time slots on in-service DMBs.                                                  | Either another DMBs must be added or cross-connections must be disconnected from the unit.                                           |
| C8          | No available time slots on in-service DS3 NPCs.                                              | Either another DS3 NPC must be added or cross-connections must be disconnected from the unit.                                        |
| C9          | Cable tests omitted because there is not an in-service NPC and thus no available time slots. | Grow and restore another NPC in the unit.                                                                                            |

12. Enter the command to remove the ETSI pack for the unit from the service per Figure 5.21-1. Replace the ETSI pack and enter the command to restore the pack in service per Figure 5.21-1.
13. Enter **DGN-EQPT::UNIT-qq::FMT-s**; for the same FMT plug-in.
- If the DGN FMT (HFMT) message shows trouble number STF 0F05 or 0F07 and an optional second line with UPN and XPN numbers, continue with Step **14**.

- If the DGN ...ATP message is received, proceed to Step 16.

**NOTE:**

The diagnostic reports one cable problem at a time; so if different UPN and XPN numbers occur, clear that trouble before contacting technical consultant.

- From Table 5.21-2, identify the faulty cable connecting to the subject DS3U (HDS3U) 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.
- Replace (or have repaired) the cable identified above. The ECCN plug numbers are stamped alongside the connectors on the ECCN panel; see Figure 5.21-2. The cable leads and terminal numbering on the connector plugs are identified in SD-96699-01.

**Table 5.21-2. FMT (HFMT) Cable Identification**

| Unit Plug | ECCN Plug    | Direction | Involved FMT |
|-----------|--------------|-----------|--------------|
| P1        | P<unit No.>A | Receive   | 0            |
| P2        | P<unit No.>E | Transmit  | 0            |
| P3        | P<unit No.>B | Receive   | 0            |
| P4        | P<unit No.>F | Transmit  | 0            |
| P5        | P<unit No.>C | Receive   | 0            |
| P6        | P<unit No.>G | Transmit  | 0            |
| P7        | P<unit No.>D | Receive   | 0            |
| P8        | P<unit No.>H | Transmit  | 0            |
| P10       | P<unit No.>A | Receive   | 1            |
| P11       | P<unit No.>E | Transmit  | 1            |
| P12       | P<unit No.>B | Receive   | 1            |
| P13       | P<unit No.>F | Transmit  | 1            |
| P14       | P<unit No.>C | Receive   | 1            |
| P15       | P<unit No.>G | Transmit  | 1            |
| P16       | P<unit No.>D | Receive   | 1            |
| P17       | P<unit No.>H | Transmit  | 1            |

- Enter **RST-EQPT: :UNIT-[q]q: :FMT-s;** to restore the subject FMT (HFMT).
  - If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.

| (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 |   |
| B                          | P15A | P15B | P15C | P15D | P15E | P15F | P15G | P15H |   |
| O                          | P16A | P16B | P16C | P16D | P16E | P16F | P16G | P16H | T |
| T                          | P17A | P17B | P18A |      |      | P19  |      |      | O |
| T                          | P14A | P14B | P14C | P14D | P14E | P14F | P14G | P14H | P |
| O                          | P13A | P13B | P13C | P13D | P13E | P13F | P13G | P13H |   |
| M                          | 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) |      |      |      |      |      |      |      |      |   |

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**Figure 5.21-2. Cable Connectors on ECCN Panel**


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## Controller and Link Troubles

### General Tasks

# 6

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### Contents

|                                            |                          |
|--------------------------------------------|--------------------------|
| ■ Clear Processor Failure Alarm            | GT <a href="#">6.1-1</a> |
| ■ Clear Frame Startup Trouble              | GT <a href="#">6.2-1</a> |
| ■ Clear RESET TOD/DATE Message             | GT 6-31                  |
| ■ Clear Overload Message                   | GT <a href="#">6.4-1</a> |
| ■ Clear Inoperative Terminal (System Hung) | GT <a href="#">6.5-1</a> |
| ■ Clear Repeated RL Command Response       | GT <a href="#">6.6-1</a> |
| ■ Establish Administrative Link at DACS II | GT <a href="#">6.7-1</a> |

---





---

## Clear Processor Failure Alarm

# 6.1

---

**When to Use**                      Use this procedure to clear a Processor Failure Alarm.

---

### **Instructions**

---

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 ...COMPLD 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-EQPT::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.

**CAUTION:**

*If the CPU2 is named, replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button. Do not perform the RESET in STEP 12.*

- 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.
-



---

|                    |                                                    |
|--------------------|----------------------------------------------------|
| <b>When to Use</b> | Use this procedure to clear Frame startup trouble. |
|--------------------|----------------------------------------------------|

---

### **Instructions**

---

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 9600 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/ICI startup, replace the CI or ICI, 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.

**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button.*

- For CI/ICI, replace CI or ICI.
  - 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), you have completed this procedure. Reconnect link cables.
  - If the reset completes with conditions (COND), 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.

**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button.*

- For CI/ICI, replace CI (TM658C) or ICI.
  - 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 6.2-1, determine the meaning of the condition (COND) code in the trouble message.

**Table 6.2-1. 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.

**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button.*

- e. To restore the SMEM card, enter the following command:

**RST -EQPT : : SMEM, BKGRND !**





---

## Clear RESET TOD/DATE Message

# 6.3

---

**When to Use**                      Use this procedure to clear a RESET TOD/DATE message.

---

### **Instructions**

---

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 or ICI 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 **OPR-ACO-ALL;**.
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 hrmsnc.
3. Check these times against the actual times.



**NOTE:**

Enter **RTRV-HDR;** to display the time again.

## 4. Does either time or date need to be reset?

- If the time needs to be reset, enter **ED-DATE:[xy]::[ww]:hh-mm-ss**; 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 **ED-DATE:[xy]::[ww]:[ce]yy-mm-dd:[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)                                                        |
| INT bb | = | Optional, to set interval at which the date will be printed, 01, 02, 04, 06, 08, 12, or 24 hours (default). |

---

---

**When to Use**      Use this procedure to clear an OVERLOAD Message.

---

### **Instructions**

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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-EQPT::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-EQPT::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-EQPT: :MC;**. If command cannot be completed, continue with Step 7.
7. Replace the MC pack implicated from the OVERLOAD message.

**CAUTION:**

*If the CPU2 is named, replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button. Do not perform the RESET in STEP 8.*

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)

# 6.5

---

**When to Use**      Use this procedure to clear inoperative terminal (system hung).

---

### **Instructions**

---



**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).
- Use a G9 adapter for a link to CIU (craft interface unit) for *SLC* Series 5 carrier. This is for an asynchronous link.

**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 **RTRV-PRMTR-LINK:[xy]:j[mm]:[ww];**

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 6.5-1 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 **ED-PRMTR-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.)

/\*Protocol\*/

"{S/X}"

/\*Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status\*/

"bb:e:k:q:x:m,p,hh"

Protocol = S for Snider (Async) or X for X.25 (Synchronous)  
 bb = <baud> = 03,06,12,24,48,96  
 e = <backspace> = 0 for true backspace, 1 for underscore backspace,  
 or dash (—) for synchronous link.  
 k = <alarm> = 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.  
 m = <mode> = 0 (idle), 1 (input message), or 2 (output message)  
 p = <software> = 0 (protocol exchanges in-service) or 1 (protocol  
 exchanges  
 out-of-service, which slows down DACS II  
 response time)  
 hh = <hardware> = 03 (hardware in-service) or 04 (hardware out-of-  
 service)

ADDITIONAL LINES FOR X.25:

```

/*Data Link Layer parameters: Frame address*/
"K-b,T1-eee,T3-ggg,N2-aa:{A/B}"
/*Packet Layer parameters*/
"W-c,P-ddd,T20-iii,T22-jjj,T23-kkk,T25-lll,T26-mmm,R20-nn,R22-p,R23-
q,R25-r"
/*PVC and SVC range: PVC and SVC group number*/
"ppss:gghh"
  
```

**Figure 6.5-1. Link Status Register**

6. Enter **DGN-EQPT: : 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-EQPT: : LINK-j ;** and **RST-EQPT: : LINK-j ;**
8. On suspect link, try entering **RTRV-HDR-NE ;** 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 or ICI 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.

**CAUTION:**

*Replacing the CPU2 will cause a power-up reset. DO NOT interrupt this reset by pressing the RESET button.*

- 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

# 6.6

---

**When to Use**                      Use this procedure to clear repeated RL command response.

---

### **Instructions**

---

1. If **RL** appears on the command line after the command is entered, reenter the command. If RL is received again, enter **RTRV-HDR-NE**; 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 GT 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

# 6.7

---

### When to Use

Use this procedure to establish an Administrative Link at the DACS II.

---

### Instructions

---

This procedure is used to prepare DACS II links for connections. There are six links available for connection of terminal equipment and operations systems. The characteristics of each link can be changed from the defaults provided by DACS II using the ED PRMTR LINK commands herein. The ICI 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).
- Use a G9 adapter for a link to CIU (craft interface unit) for *SLC* Series 5 carrier. This is for an asynchronous link.

**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:  
**ED-PRMTR-LINK: [xy]: j : [ww] : PTCOL-S[, BAUD-bb]**  
**[, ALM-k][, BS-e][, ENQ-q][, XON-x][: INIT];** or  
**ED-PRMTR-LINK: [xy]: j : [ww] : PTCOL-M[, ALM-k][: INIT];**  
**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)

- j = Physical link number (1 through 6)
- 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.
- 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:

```
ED-PRMTR-LINK: :j: :PTCOL-T, BAUD-bb;
ED-PRMTR-LINK: [<xy>]:j:[ww]:APPL-{ASCS|ASCD|PM}
[,L2AD-aa][,POLL-ttt];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, or PM = Selects application as follows:  
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  
**ED-PRMTR-LINK: [xy]: j : [ww] : PTCOL-X[, ALM-k][:INIT];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 **RTRV-PRMTR-LINK: [xy]: j [mm] : [ww] ;UTL::QRY,STR,LINK j [mm] !** to see the existing (or default) link parameter values (see Table 6.7-1. The link must be removed from service to change parameters. See Figure 6.7-1.
8. To enter different **data layer** values, list the subject parameter followed by the value (for example, K-5). Enter the command as follows:  
**ED-PRMTR-LINK: [xy]: j : [ww] : [K-b][, T1-eee][, T3-ggg][, N2-aa][, 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 6.7-1
  - 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:  
**ED-PRMTR-LINK: [xy]: j [mm] : [ww] : [<param>-<value>, ... <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 6.7-1 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 DENY message with explanation that link is out-of-service is received, enter **RST-EQPT : : LINK - l**; and reenter ED LINK command. Conversely, for synchronous link, enter **RMV-EQPT : : LINK - l**; if link is in-service.
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-EQPT : : 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.

/\*Protocol\*/

"{S/X}"

/\*Baud:Backspace:Alarm:Enq/Ack:Xon/Xoff:Mode,Software,Hardware status\*/

"bb:e:k:q:x:m,p,hh"

Protocol = S for Snider (Async) or X for X.25 (Synchronous)  
 bb = <baud> = 03,06,12,24,48,96  
 e = <backspace> = 0 for true backspace, 1 for underscore backspace, or dash (—) for synchronous link.  
 k = <alarm> = 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.  
 m = <mode> = 0 (idle), 1 (input message), or 2 (output message)

Protocol = S for Snider (Async) or X for X.25 (Synchronous)  
 p = <software> = 0 (protocol exchanges in-service) or 1 (protocol exchanges out-of-service, which slows down DACS II response time)  
 hh = <hardware> = 03 (hardware in-service) or 04 (hardware out-of-service)

ADDITIONAL LINES FOR X.25:

/\*Data Link Layer parameters: Frame address\*/  
 "K-b,T1-eee,T3-ggg,N2-aa:{A/B}"  
 /\*Packet Layer parameters\*/  
 "W-c,P-ddd,T20-iii,T22-jjj,T23-kkk,T25-lll,T26-mmm,R20-nn,R22-p,R23-q,R25-r"  
 /\*PVC and SVC range: PVC and SVC group number\*/  
 "ppss:gghh"

**Figure 6.7-1. Link Status Register**

**Table 6.7-1. Synchronous Link Level Parameters**

| Parameter Designation      | Meaning                      | Value Range            | Default |
|----------------------------|------------------------------|------------------------|---------|
| <b>Data Layer Values</b>   |                              |                        |         |
| 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      |
| <b>Packet Layer Values</b> |                              |                        |         |
| 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:



**Table 6.7-1. Synchronous Link Level Parameters**

| <b>Parameter Designation</b> | <b>Meaning</b>                                                                                             | <b>Value Range</b> | <b>Default</b> |
|------------------------------|------------------------------------------------------------------------------------------------------------|--------------------|----------------|
| 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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## **Data Base Troubles**

### **General Tasks**

# 7

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### **Contents**

- Clear BMTR DNY Trouble GT [7.1-1](#)
  - Clear Reset, Boot, RST MC Conditional Completion GT [7.2-1](#)
-



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**When to Use**                      Use this procedure to clear BMTR DNY trouble.

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### **Instructions**

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1. To transfer the database or executables between the memory cards via the CPY 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 **CPY** from WKG to MEM the frame must be in-service.  
If necessary—  
Enter **RST-EQPT::MC::MCOND**; to go to MCOND and log on as user DAX or user with RMON enabled.
2. Reenter the CPY MEM command that was denied.
3. If CPY ...DENY 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-EQPT::MC to exit maintenance condition.
4. Locate the denial error explanation in the output message.

**NOTE:**

Anytime the CPY MEM command is reentered and a different denial is received in the procedure, return here to clear the new denial.

5. Which denial explanation appears in the CPY output message?
  - If **Frame not in service**, proceed to Step 6.
  - If **MP or unit RAM error**, proceed to Step 8.
  - If **unit out-of-service**, proceed to Step 8.
  - If **problem occurred while accessing PMEM**, then proceed to Step 14.
  - If **source does not contain requested information**, then proceed to Step 14.
  - If **DB PMEM error OP-CL-RD-WR-SK**, proceed to Step 14.
  - If **DB can't send or receive mail**, proceed to Step 23.
  - If **can't lock or unlock RAM data base**, proceed to Step 23.
  - If **DB can't get slave mailbox**, proceed to Step 23.
  - If **invalid option, mailbox, or flag**, then proceed to Step 23.
  - If **SMEM not present**, then proceed to Step 28.
  - If **problem occurred while accessing SMEM**, then proceed to Step 28.
  - If **SMEM is not restored**, proceed to Step 28.
  - If **entity can't be addressed in this configuration**, then proceed to Step 32.
  - If **software identification block not readable**, then proceed to Step 35.
  - If **software identification block failed comparison**, then proceed to Step 35.
  - If **checksums verification failed**, proceed to Step 35.
  - If **memory card contains previous software journal files**, proceed to Step 37.
  - If **FPI on SMEM does not match one on PMEM**, proceed to Step 37.
  - If **can't mount/unmount PMEM**, proceed to Step 40.
  - If **PMEM not restored**, proceed to Step 40.
6. Enter the following:

**RST-EQPT : :MC;**

7. Reenter the **CPY** command.
  - If the command completes successfully, this procedure is completed.
  - If the same denial is received, contact technical consultant.

**For RAM Error or Unit Out-of-Service, Continue:**

8. Attempt to locate failed pack or out-of-service unit using the following commands:

**DGN-EQPT : :MP;**

**DGN-EQPT : :UNIT- [q]q : :UC;** (where [q]q = unit number 1 through 16)

- If commands are denied because MC is out-of-service, enter **RST-EQPT : :MC;**.
9. Enter **RTRV-STATE-EQPT : : :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. nUnequipped NPCs are indicated by dashes.

10. If you are clearing "unit out-of-service ..." and have units out-of-service, enter command(s) to restore service as follows:  
**RST-EQPT : :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 **STA-LOCL-RST : :PMEM;**. 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-EQPT : :MC : :MCOND**

**RST-EQPT : :SMEM**

- Reenter the **CPY** command.
- If the same denial is received, contact technical consultant.

**For Problem-Accessing PMEM, Source Does Not Contain, or DB PMEM Error, Continue:**

14. Enter **RST-EQPT : PMEM**; to ensure the PMEM is restored.
  - If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion (Supplemental Information - Replace PMEM Card).
15. Reenter the CPY command that was originally denied.
  - If "problem-accessing PMEM" or "PMEM error" is received again, proceed to "Supplemental Information - Replace PMEM Card."
  - If "source does not contain ..." is received again, proceed to "Supplemental Information - Replace PMEM Card."
  - If the **CPY** command completes successfully—  
Enter **RST-EQPT : MC**; to exit the maintenance condition. This procedure is completed.
16. If SMEM is the source for the CPY command and "source does not contain requested information" is received—  
Place the ESD grounding strap on your wrist and replace the SMEM card with the most recent archived copy.
17. Reenter the **CPY** command that was originally denied.
  - If problem persists contact technical consultant.
  - If **CPY** command completes, proceed with next step.
18. Enter the following command:  
**RMV-EQPT : 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 DB Can't Send ..., Can't Lock/Unlock DB, DB Can't Get Mailbox, or Invalid Mailbox ..., Continue:**
23. Check printout for ERR SOFTWARE messages that name the SMEM or PMEM.
24. Enter **DGN-EQPT : 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 COMPLD (with no error explanation) is received, continue with next step.
  - If RESET COMPLD (with error explanation) is received, go to Section 7.2.
27. Reenter the CPY command that was denied.
  - If the command completes, this procedure is completed. Enter **RST-EQPT : :MC**; to exit the maintenance condition.
  - If the same denial is received, contact technical consultant.

**For Problem -While Accessing SMEM or -SMEM Not Restored, Continue:**

28. Perform the following to ensure that the SMEM is installed and powered up:
  - Verify that the SMEM is installed.
  - Enter **RST-EQPT : :SMEM** to power up SMEM and place it in-service.
29. Reenter the original **CPY** command that was denied.
  - If the command is denied again, continue with the next step:
  - If CPY ...DENY message is not received when original CPY command is reentered,  
Enter **RST-EQPT : :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 CPY command that was denied.

- If the command is completed, this procedure is completed. Enter **RST-EQPT : :MC;** to exit the maintenance condition.
- If the same denial is received, contact technical consultant.

**For Entity Can't Be Addressed, Continue:**

32. The configuration information on the SMEM does not match the frame configuration. Enter **RTRV-PRMTR-NE;** 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 CPY command that was denied.
- If the command completes, this procedure is completed. Enter **RST-EQPT : :MC;** to exit the maintenance condition.
  - If the same denial is received, contact technical consultant.

**For Software - Not Readable, Software - Failed Comparison, or Checksums Verification Failed, Continue:**

35. If the correct SMEM is not installed, place the ESD grounding strap on your wrist and install it.
36. Reenter the CPY 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 Memory Card Contains Previous Software or FPI On SMEM Does Not Match, Continue:**

37. The wrong memory card is installed in the SMEM slot. The "memory card contains previous software" explanation indicates that it is an old memory card that contains previous software information, and "FPI on SMEM does not match" explanation 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 CPY command that was denied.
- If the command completes, this procedure is completed. Enter **RST-EQPT : :MC;** to exit the maintenance condition.

- If the same denial is received, contact technical consultant.
40. Enter command to restore PMEM to service, **RST-EQPT : :PMEM;**.
- If RST ...DENY message is received, find the reason for the denial in the output message and perform corrective action to obtain command completion.
41. Reenter CPY command that was denied.
- If the same denial is received, contact technical consultant.
  - If the denial message is not received, enter **RST-EQPT : :MC;** to exit the maintenance condition, this procedure is completed.
-



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## Clear Reset, Boot, RST MC Conditional Completion

# 7.2

---

**When to Use** Use this procedure to clear Reset, Boot, RST MC Conditional Completion.

---

### **Instructions**

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This procedure is used to respond to a conditional (with errors) completion of a frame reset, STA-LOCL-RST 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.

1. Locate the error explanation in the RESET, STA-LOCL-RST, 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 error explanation is given in the RESET, RST MC, or BOOT message?
  - If **Failed to Boot CONF 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 **Failed to Boot DB**, proceed with Step 4.
  - If **Failed to Boot Journal**, continue with Step 3.
  - If **Failed to Boot Unit**, proceed to Step 9.
  - If **PMEM Failed, SMEM Used**, proceed to Step 11.
  - If **PMEM Error, Boot from SMEM**, proceed to Step 11.
  - If **Failed to boot CI**, proceed to Step 13.

**Failed To Boot Journal, Continue**

3. If conditional completion was received as part of doing INIT SYS FRAME or using the DLT FPKG command, there is a discrepancy between the journal files in the working RAM and the PMEM.
  - Enter **RST-EQPT : :MC : :NOJRNL ;** 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.

**Failed To Boot DB, 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-EQPT : :MC : :MCOND**
  - b. If SMEM and/or PMEM is not in service—  
Enter the following command(s):  
**RST-EQPT : :PMEM**  
**RST-EQPT : :SMEM**
  - c. Logon as user DAX or user with RMON enabled—

- d. Enter **CPY-MEM: [xy] : : [ww] : SMEM, PMEM;** to copy the data base information onto the PMEM.
        - If CPY ...DENY message is received from the transfer, go to GT 7.1.
5. On the DACS II status panel, hold the **RESET ENABLE** switch to **ON** and momentarily press the **RESET** button.
  - If RESET ...COMPLD (with no error explanation) message is received, this procedure is completed.
  - If RESET ...COMPLD (with same error) 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-EQPT : : MC : : MCOND**
  - b. If SMEM and/or PMEM is not in service—  
Enter the following command(s):  
**RST-EQPT : : PMEM**  
**RST-EQPT : : SMEM**
  - c. Logon as user DAX or user with RMON enabled—
  - d. Enter **CPY-MEM: [xy] : : [ww] : SMEM, PMEM;** to copy the data base information onto the PMEM.
    - If CPY ...DENY message is received, go to Section 7.1.
    - If CPY 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 ...COMPLD (with no error explanation) message is received,

**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 mml) message is received, contact technical consultant.

**For Failed To Boot Unit, Continue**

9. Enter **RTRV-STATE-EQPT : [UNIT - [q]q] : ALL**; to find the unit UC which is out-of-service. The subject unit may have been removed by error recovery.
10. Enter **RST-EQPT : 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 PMEM Failed-SMEM Used for Boot, 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 Failed to boot CI, Continue**

13. Replace the CI or ICI 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 ...COMPLD (with no error explanation) message is received, this procedure is completed.
  - If RESET ...COMPLD (with error explanation) message is received, contact technical consultant.



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## Frame Audits

## General Tasks

# 8

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### Contents

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- Clear DGNDDET Message 82002 GT [8.1-1](#)
  - Clear DGNDDET Message 82001 or AUD 82004 Trouble GT [8.2-1](#)
  - Clear DGNDDET Message 82003 GT [8.3-1](#)
-



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**When to Use**                      Use this procedure to clear a DGNDDET message 82002.

---

### **Instructions**

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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 DGNDDET 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 DGNDDET 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 DGNDDET 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 DGNDDET 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 number the associated corrective action appears in:

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 002                | 8-1            |
| 003                | 8-1            |
| 004                | 8-1            |
| 005                | 8-1            |
| 006                | 8-1            |
| 007                | 8-1            |
| 008                | 8-1            |
| 009                | 8-4            |
| 00A                | 8-4            |
| 00B                | 8-4            |
| 00C                | 8-4            |
| 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            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 029                | 8-1            |
| 033                | 8-3            |
| 034                | 8-3            |
| 035                | 8-3            |
| 036                | 8-3            |
| 037                | 8-3            |
| 038                | 8-3            |
| 039                | 8-3            |
| 03B                | 8-4            |
| 03C                | 8-4            |
| 03D                | 8-4            |
| 03E                | 8-4            |
| 03F                | 8-4            |
| 040                | 8-3            |
| 041                | 8-3            |
| 042                | 8-3            |
| 043                | 8-4            |
| 044                | 8-4            |
| 045                | 8-4            |
| 046                | 8-4            |
| 047                | 8-4            |
| 048                | 8-4            |
| 049                | 8-4            |
| 04A                | 8-4            |
| 04B                | 8-4            |
| 04C                | 8-4            |
| 04D                | 8-4            |
| 050                | 8-3            |
| 052                | 8-3            |
| 055                | 8-3            |
| 056                | 8-3            |
| 057                | 8-3            |
| 058                | 8-3            |
| 059                | 8-3            |
| 05A                | 8-3            |
| 05B                | 8-3            |
| 05C                | 8-3            |
| 060                | 8-3            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 061                | 8-3            |
| 062                | 8-3            |
| 063                | 8-3            |
| 064                | 8-3            |
| 065                | 8-3            |
| 066                | 8-3            |
| 069                | 8-3            |
| 06A                | 8-3            |
| 06B                | 8-3            |
| 06C                | 8-3            |
| 06D                | 8-3            |
| 06E                | 8-3            |
| 06F                | 8-3            |
| 070                | 8-3            |
| 071                | 8-3            |
| 072                | 8-3            |
| 073                | 8-3            |
| 074                | 8-3            |
| 076                | 8-3            |
| 077                | 8-3            |
| 078                | 8-3            |
| 079                | 8-3            |
| 07A                | 8-3            |
| 07B                | 8-3            |
| 07C                | 8-3            |
| 07D                | 8-3            |
| 07E                | 8-3            |
| 07F                | 8-3            |
| 080                | 8-3            |
| 081                | 8-3            |
| 084                | 8-3            |
| 102                | 8-1            |
| 103                | 8-1            |
| 104                | 8-1            |
| 105                | 8-1            |
| 106                | 8-1            |
| 112                | 8-1            |
| 113                | 8-1            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 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            |
| 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            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 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            |
| 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            |
| 240                | 8-3            |
| 241                | 8-3            |
| 242                | 8-3            |
| 250                | 8-3            |
| 251                | 8-3            |
| 253                | 8-4            |
| 254                | 8-4            |
| 255                | 8-4            |
| 256                | 8-4            |
| 257                | 8-4            |
| 258                | 8-4            |



| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 259                | 8-4            |
| 25A                | 8-4            |
| 25B                | 8-4            |
| 25C                | 8-4            |
| 25D                | 8-4            |
| 25E                | 8-4            |
| 25F                | 8-4            |
| 260                | 8-4            |
| 261                | 8-4            |
| 262                | 8-4            |
| 263                | 8-4            |
| 264                | 8-4            |
| 265                | 8-4            |
| 270                | 8-5            |
| 271                | 8-5            |
| 272                | 8-5            |
| 273                | 8-5            |
| 274                | 8-5            |
| 275                | 8-5            |
| 276                | 8-5            |
| 277                | 8-5            |
| 278                | 8-5            |
| 279                | 8-5            |
| 27A                | 8-5            |
| 27B                | 8-5            |
| 27C                | 8-5            |
| 27D                | 8-5            |
| 27E                | 8-5            |
| 27F                | 8-5            |
| 280                | 8-5            |
| 281                | 8-5            |
| 282                | 8-5            |
| 283                | 8-5            |
| 284                | 8-5            |
| 285                | 8-5            |
| 286                | 8-5            |
| 287                | 8-5            |
| 288                | 8-5            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 289                | 8-5            |
| 28A                | 8-5            |
| 28B                | 8-5            |
| 28C                | 8-5            |
| 28D                | 8-5            |
| 28E                | 8-5            |
| 28F                | 8-5            |
| 290                | 8-5            |
| 291                | 8-5            |
| 292                | 8-5            |
| 293                | 8-5            |
| 294                | 8-5            |
| 295                | 8-5            |
| 296                | 8-5            |
| 297                | 8-5            |
| 298                | 8-5            |
| 299                | 8-5            |
| 29A                | 8-5            |
| 29B                | 8-5            |
| 29C                | 8-5            |
| 29D                | 8-5            |
| 29E                | 8-5            |
| 29F                | 8-5            |
| 2A0                | 8-5            |
| 2A1                | 8-5            |
| 2A2                | 8-5            |
| 2A3                | 8-5            |
| 2A4                | 8-5            |
| 2A5                | 8-5            |
| 2A6                | 8-5            |
| 2A7                | 8-5            |
| 2A8                | 8-5            |
| 2A9                | 8-5            |
| 2AA                | 8-5            |
| 2AB                | 8-5            |
| 301                | 8-1            |
| 302                | 8-1            |
| 303                | 8-1            |

| <b>Frame Audit</b> | <b>Table #</b> |
|--------------------|----------------|
| 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            |
| 320                | 8-4            |
| 321                | 8-4            |
| 322                | 8-4            |
| 323                | 8-4            |
| 324                | 8-4            |
| 325                | 8-4            |
| 326                | 8-4            |
| 327                | 8-4            |
| 328                | 8-4            |
| 329                | 8-4            |
| 32A                | 8-4            |
| 32B                | 8-4            |
| 32C                | 8-4            |
| 32D                | 8-4            |
| 32E                | 8-4            |
| 32F                | 8-4            |
| 330                | 8-4            |
| 331                | 8-4            |
| 332                | 8-4            |
| 333                | 8-4            |
| 334                | 8-4            |
| 335                | 8-4            |
| 336                | 8-4            |

2. Refer to Table 8.1-1, 8.1-2, 8.1-3, or 8.1-4 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 DGNDDET on an NPC or facility, the NPC number is determined by converting the HEX pack value to decimal. See Figure 8.1-1 for an example and Table 8.1-6 for hexadecimal numbers from 1 to 160. To get the NPC number in other units, add 160 for each preceeding unit.
3. If the DGNDDET recurs and the unit controller has not already been removed and restored, enter **RMV-EQPT::UNIT-[q]q::UC;** and **RST-EQPT::UNIT-[q]q::UC;**
  4. If the DGNDDET message recurs and the frame has not already been booted, enter **STA-LOCL-RST::PRI;**.
  5. If any DGNDDET 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 8.1-1. Equipage/Provisioning**

| <b>ttt =</b>                                                                    | <b>Pack</b>  | <b>Data Bytes*</b>                   | <b>Corrective Action</b>                                                                                                                                                 |
|---------------------------------------------------------------------------------|--------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 002                                                                             | FTMI         | d5=unit No.                          | Enter RMV-EQPT::UNIT-[q]q::UC;<br>and RST-EQPT::UNIT-[q]q::UC;                                                                                                           |
| 003                                                                             | FC           | d4=pack No.                          |                                                                                                                                                                          |
| 007                                                                             | UNIT         | (NPCs - HEX No.)†                    |                                                                                                                                                                          |
| 032                                                                             | DSPI         |                                      |                                                                                                                                                                          |
| 008                                                                             | ECCN         | d4=ECCN side (0, 1)                  | Enter RMV-EQPT::CCI-s;<br>and RST-EQPT::CCI-s;                                                                                                                           |
| 011                                                                             | NPC          | d5=unit No.<br>d4=NPC No. (HEX No.)† | Enter RMV-EQPT::NPC-<npc No.>;<br>and RST-EQPT::NPC-<npc No.>;                                                                                                           |
| 021                                                                             | CCN          | d5=side (00 or 01)                   | (1) Remove and restore any<br>Pack on subject side<br>(2) Enter STA-LOCL-RST::PRI;                                                                                       |
| 022                                                                             | CCNI         | d4=pack No.                          |                                                                                                                                                                          |
| 023                                                                             | CCB          |                                      |                                                                                                                                                                          |
| 024                                                                             | TSI          | TSI=d5,d4,d3                         |                                                                                                                                                                          |
| 025                                                                             | CCN          | d5=side (00 or 1)                    | Enter STA-LOCL-RST::PRI;                                                                                                                                                 |
| 205                                                                             | FTMI         | d5=unit No.                          | (1) Enter RMV-EQPT and RST-EQPT<br>commands for subject pack<br>(2) Look for DGN-STF<br>(3) If recurs, enter<br>RMV-EQPT::UNIT-[q]q::UC; and<br>RST-EQPT::UNIT-[q]q::UC; |
| 207                                                                             | FC           | d4=pack No. (01-04)                  |                                                                                                                                                                          |
| 208                                                                             | NPC          | (NPCs=HEX No.)†                      |                                                                                                                                                                          |
| 209                                                                             | NPC          |                                      |                                                                                                                                                                          |
|                                                                                 |              |                                      |                                                                                                                                                                          |
| 210                                                                             | FC           | d3=side, d4=FTMI<br>d5=unit No.      | Enter RMV-EQPT::UNIT-[q]q::FC-sf;<br>and RST-EQPT::UNIT-[q]q::FC-sf;                                                                                                     |
| 301                                                                             | CCN<br>Group | d5=side                              | Remove and restore any pack on side.<br>If side is active, go to other<br>side first (SW-DX-EQPT::XC-a;)                                                                 |
| 302                                                                             | TSI          | TSI=d5,d4,d3                         | Enter commands to RMV-EQPT                                                                                                                                               |
| 303                                                                             | CCB          | d5=side, d4=CCB No.                  | and RST-EQPT subject pack                                                                                                                                                |
| 308                                                                             | LINK         | d5=link No. (01-06)                  | Enter commands to                                                                                                                                                        |
| * 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.                          |              |                                      |                                                                                                                                                                          |

| <b>ttt =</b> | <b>Data Bytes*</b>                 | <b>Corrective Action</b>                                                                                                         |
|--------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 004,005,006  | d5=Unit No.<br>d4=FTMI No. (01-04) | (1) Enter <b>RMV : :UNIT [q]q, UC!</b><br>and <b>RST : :UNIT [q]q, UC!</b><br>(2) If recurs, enter<br><b>UTL : :BOOT, FRAME!</b> |
| 012,013,014, | d5=Unit No.                        | (1) Enter <b>RMV : :UNIT [q]q, UC!</b>                                                                                           |

| <b>ttt =</b>                                                                                           | <b>Data Bytes*</b>                                                                 | <b>Corrective Action</b>                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 015,016,017<br>018                                                                                     | d4=NPC No. (HEX<br>01-A0)†                                                         | and <b>RST::UNIT [q]q,UC!</b><br>(2) Enter <b>RMV::NPC &lt;npc No.&gt;!</b><br>and <b>RST::NPC &lt;npc No.&gt;!</b>                                                                                             |
| 026-029                                                                                                | d5=ECCN side (0,1)                                                                 | Enter <b>RMV::ETSI sqq!</b><br>and <b>RST::ETSI sqq!</b>                                                                                                                                                        |
| 211,215,<br>216,217,<br>218                                                                            | d5=Unit No.<br>d4=NPC No.                                                          | (1) Enter <b>RMV::NPC &lt;npc No.&gt;!</b><br>and <b>RST::NPC &lt;npc No.&gt;!</b><br>(2) If recurs, remove 2 NPCs,<br>reseat pack, and restore                                                                 |
| 102,103,104,<br>105,106,112,<br>113,114,115,<br>116,125,126,<br>127,128,135,<br>136,154,155<br>156,157 |                                                                                    | Enter <b>UTL::BOOT,FRAME!</b>                                                                                                                                                                                   |
| 121,122,123,<br>131,132,133,<br>150,151,152,<br>160,161,162,<br>163,164,165,<br>166,167,168            | d5=Unit No.<br>d4=NPC No.                                                          | Enter <b>RMV::UNIT [q]q,UC!</b><br>and <b>RST::UNIT [q]q,UC!</b>                                                                                                                                                |
| 305,306,307,<br>310,311,312,<br>313,314,315                                                            | d5=SYNC side (0,1)<br>d4=TLI No. (01-04)<br>(except for ttt=305, 312,<br>313, 314) | (1) If TLI is named, remove<br>and restore SYNC TLI<br>(2) Enter <b>ULT::QRY,STATE,SYNC!</b><br>and look for SOURCE TLI,MATE<br>(3) Enter <b>RMV::SYNC a!</b><br>and <b>RST::SYNC a!</b><br>(byte d5=sync side) |
| 316,317                                                                                                | d5=ECCN side (0,1)                                                                 | Enter <b>RMV::CCI s!</b><br>and <b>RST::CCI s!</b>                                                                                                                                                              |

\* 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 8.1-2. Facility Error Thesholds**

| <b>ttt =</b>                                                                                | <b>Data Bytes*</b>         | <b>Corrective Action</b>                                                           |
|---------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------|
| 171,172,173<br>174                                                                          | d5=Unit No.<br>d4=NPC No.  | <b>RMV-EQPT::NPC-&lt;npc No.&gt;; and</b><br><b>RST-EQPT::NPC-&lt;npc No.&gt;;</b> |
| 019,01A,01B<br>01C,01D                                                                      | d5=Unit No.<br>d4=NPC No.† | <b>RMV-EQPT::UNIT-[q]q::UC; and</b><br><b>RST-EQPT::UNIT-[q]q::UC;</b>             |
| 220,221,222,223,224,<br>225,226,227,228,229,<br>230,231,232,233,234,<br>235,236,237,238,239 | d5=Unit No.<br>d4=NPC No.† | <b>RMV-EQPT::NPC-&lt;npc No.&gt;; and</b><br><b>RST-EQPT::NPC-&lt;npc No.&gt;;</b> |
| * 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 8.1-3. Subscriber Carrier and Subrate Data**

| <b>ttt =</b>                                                                                           | <b>Data Bytes*</b>                                                                                               | <b>Corrective Action</b>                                                                           |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 033,034,035,036,<br>037,038,039,042,                                                                   | d5=Unit No.<br>d4=NPC (for 251)                                                                                  | <b>RMV-EQPT::UNIT-[q]q::UC; and</b><br><b>RST-EQPT::UNIT-[q]q::UC;</b>                             |
| 050,052,250,251,<br>055,056,057,058,<br>059,060,061,062<br>063,064,065,066,<br>086,089-091,093,<br>095 | d5=Unit No.<br>d4=RT/DL<br>(coded - internal number)                                                             | <b>RMV-EQPT::UNIT-[q]q::UC; and</b><br><b>RST-EQPT::UNIT-[q]q::UC;</b>                             |
| 05A                                                                                                    | d0=Unit No.                                                                                                      | <b>RMV-EQPT::UNIT-[q]q::UC; and</b><br><b>RST-EQPT::UNIT-[q]q::UC;</b>                             |
| 05B                                                                                                    | d0=1(frame), 2(unit),<br>3(channel) or 4(time slot)<br>d3=NPC No. (if applicable)<br>d4=Unit No. (if applicable) | <b>RMV-EQPT::UNIT-[q]q::UC; and</b><br><b>RST-EQPT::UNIT[q]q::UC;</b>                              |
| 05C                                                                                                    | d0-d5=not used                                                                                                   | <b>STA-LOC-RST::PRI;</b>                                                                           |
| 069-074,076-081,<br>084                                                                                | d4=MJU/SRM/chan. No.<br>d1=NPC No.                                                                               | <b>RMV-EQPT::NPC-&lt;npc No.&gt;::SIDE-s; and</b><br><b>RST-EQPT::NPC-&lt;npc No.&gt;::SIDE-s;</b> |
| 240,241,242                                                                                            | d4=Unit No.<br>d5=NPC No.                                                                                        | <b>RMV-EQPT::NPC-&lt;npc No.&gt;; and</b><br><b>RST-EQPT::NPC-&lt;npc No.&gt;;</b>                 |
| * The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0.                        |                                                                                                                  |                                                                                                    |

| <b>ttt =</b>                                                             | <b>Data Bytes*</b>                                                                                              | <b>Corrective Action</b>                                                                         |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 033,034,035,936<br>037,038,039,042,<br>050,052,250,251                   | d5=Unit No.<br>d4=NPC (for 251)                                                                                 | Enter <b>RMV::UNIT [q]q,UC!</b> and<br><b>RST::UNIT [q]q,UC!</b>                                 |
| 055,056,057,058<br>059,060,061,062<br>063,064,065,066<br>086,089-093,095 | d5=Unit No.<br>d4=RT/DL<br>(coded - internal number)                                                            | Enter <b>RMV::UNIT [q]q,UC!</b> and<br><b>RST::UNIT [q]q,UC!</b>                                 |
| 05A                                                                      | d0=Unit No.                                                                                                     | Enter <b>RMV::UNIT [q]q,UC!</b> and<br><b>RST::UNIT [q]q,UC!</b>                                 |
| 05B                                                                      | d0-1(frame), 2(unit)<br>3(channel) or 4(time slot)<br>d3=NPC No. (if applicable)<br>d4=Unit No. (if applicable) | Enter <b>RMV::UNIT [q]q,UC!</b> and<br><b>RST::UNIT [q]q,UC!</b>                                 |
| 05C                                                                      | d0-d5=not used                                                                                                  | Enter <b>UTL::BOOT,FRAME!</b>                                                                    |
| 069-074,<br>076-081,084                                                  | d4=MJU/SRM/chan. No.<br>d1=NPC No.                                                                              | (1) Enter <b>RMV::NPC &lt;npc No.&gt;,SIDE s!</b><br>and <b>RST::NPC &lt;npc No.&gt;,SIDE s!</b> |
| 240,241,242                                                              | d4=Unit No.<br>d5=NPC No.                                                                                       | Enter <b>RMV::NPC &lt;npc No.&gt;!</b> and<br><b>RST::NPC &lt;npc No.&gt;!</b>                   |

\* The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0.

**Table 8.1-4. DS3 Feature**

| <b>ttt =</b>                                                        | <b>Data Bytes*</b>           | <b>Corrective Action</b>                             |
|---------------------------------------------------------------------|------------------------------|------------------------------------------------------|
| 009,00A,<br>00B,00C                                                 | d4=Entity No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| 03B,03C,03D,<br>03E,03F                                             | d4=Entity No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| 040,041,042,<br>043,044,045<br>046,047                              | d4=Entity No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| 253,254,255,<br>256,257,258,<br>259,25A,25B,<br>25C,25D,25E,<br>25F | d4=Entity No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| 048,049,04A,<br>04B,04C,04D                                         | d5=Unit No.                  | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |



| <b>ttt =</b>                                                                    | <b>Data Bytes*</b>        | <b>Corrective Action</b>                             |
|---------------------------------------------------------------------------------|---------------------------|------------------------------------------------------|
| 260,261,262<br>263,264,265                                                      |                           |                                                      |
| 323,324,325,<br>326,327,328,<br>329,32A                                         | d4=MXR No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| 320,321,322<br>32B,32C,32D,<br>32E,32F,330,<br>331,332,333,<br>334,335,336      | d4=NPC No.<br>d5=Unit No. | RMV-EQPT::UNIT-[q]q::UC;<br>RST-EQPT::UNIT-[q]q::UC; |
| * The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0. |                           |                                                      |

| <b>ttt =</b>                                                        | <b>Data Bytes*</b>           | <b>Corrective Action</b>                 |
|---------------------------------------------------------------------|------------------------------|------------------------------------------|
| 009,00A,<br>00B,00C                                                 | d4=Entity No.<br>d5=Unit No. | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 03B,03C,03D,<br>03E,03F                                             | d4=Entity No.<br>d5=Unit No. | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 040,041,042,<br>043,044,045<br>046,047                              | d4=Entity No.<br>d5=Unit No. | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 253,254,255,<br>256,257,258,<br>259,25A,25B,<br>25C,25D,25E,<br>25F | d4=Entity No.<br>d5=Unit No. | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 048,049,04A,<br>04B,04C,04D<br>260,261,262<br>263,264,265           | d5=Unit No.                  | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 323,324,325,<br>326,327,328,<br>329,32A                             | d4=MXR No.<br>d5=Unit No.    | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |
| 320,321,322<br>32B,32C,32D,<br>32E,32F,330,                         | d4=NPC No.<br>d5=Unit No.    | RMV::UNIT [q]q,UC!<br>RST::UNIT [q]q,UC! |

| <b>ttt =</b>                                                                    | <b>Data Bytes*</b> | <b>Corrective Action</b> |
|---------------------------------------------------------------------------------|--------------------|--------------------------|
| 331,332,333,                                                                    |                    |                          |
| 334,335,336                                                                     |                    |                          |
| * The data bytes occur in the following left-to-right order: d5 d4 d3 d2 d1 d0. |                    |                          |

| <b>ttt=</b>       | <b>Data Bytes*</b>                       | <b>Corrective Action</b>                                   |
|-------------------|------------------------------------------|------------------------------------------------------------|
| 270,271,272,273,  | d0 Long ANSI threshold value in hardware | (1) Verify the threshold value in the database is correct. |
| 274,275,276,277,  | d1 Long ANSI threshold value in hardware |                                                            |
| 278,279,27A,27B,  | d2 Long ANSI threshold value in hardware | (2) Enter STA-LOCL-RST::PRI                                |
| 27C,27D,27E,27F,  | d3 Long ANSI threshold value in hardware |                                                            |
| 280,281,282,283,  | d4 Long ANSI threshold value in database |                                                            |
| 284,285,286,287,  | d5 Long ANSI threshold value in database |                                                            |
| 288,289,28A,28B,  | d6 Long ANSI threshold value in database |                                                            |
| 28C,28D,28E,28F,  | d7 Long ANSI threshold value in database |                                                            |
|                   | d8 NPC number                            |                                                            |
|                   | d9 UNIT number                           |                                                            |
| 290,291,292,293,  | d0 Long 30-channel threshold value       | (1) Verify the threshold value in the database is correct. |
| 294, 295,296,297, | d1 Long 30-channel threshold value       |                                                            |
| 298,299,29A,29B,  | d2 Long 30-channel threshold value       | (2) Enter STA-LOCL-RST::PRI                                |
| 29C, 29D,29E,29F, | d3 Long 30-channel threshold value       |                                                            |
| 2A0, 2A1,2A2,2A3, | d4 Long 30-channel threshold value       |                                                            |
| 2A4, 2A5,2A6,2A7, | d5 Long 30-channel threshold value       |                                                            |
| 2A8, 2A9,2AA,2AB  | d6 Long 30-channel threshold value       |                                                            |
|                   | d7 Long 30-channel threshold value       |                                                            |
|                   | d8 NPC number                            |                                                            |
|                   | d9 UNIT number                           |                                                            |

$$\begin{aligned}
 \text{Powers of 16} &= 16^3 16^2 16^1 16^0 \\
 \text{Example: Hex} &= 005A \\
 \text{Decimal Number} &= (0 \times 16^3) \\
 &\quad + (0 \times 16^2) \\
 &\quad + (5 \times 16^1) \\
 &\quad + (A \times 16^0), \text{ where } 16^0 = 1 \\
 0s &= (0 \times 0) = 0 \\
 5 &= (5 \times 16) = 80 \\
 A &= + (A \times 1) = 10, \text{ where } A = 10
 \end{aligned}$$

**Powers of 16** =  $16^3 16^2 16^1 16^0$   
**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 8.1-1. Hexadecimal-to-Decimal Conversion Example**

**Table 8.1-2. 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 DGNDT Message 82001 or AUD 82004 Trouble

# 8.2

---

**When to Use**                      Use this procedure to clear DGNDT Message 82001 or AUD 82004 trouble.

---

### **Instructions**

---

1. Are you clearing message 82004?
  - If MC keyword is in the message, continue with Step 2.
  - If not, from Table 8.2-1 determine which circuit failed the DGNDT diagnostic using the circuit abbreviation and data in the output message.
2. Enter the diagnostic command from Table 8.2-2 for the circuit named in the DGNDT message. The abbreviations for the circuits in the table match the message keywords.
3. If DGN-EQPT ...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 8.2-1. Circuit Pack Identification**

| <b>Circuit</b> | <b>3-Digit Field (eee)</b> | <b>Data Byte (d0)</b>   |
|----------------|----------------------------|-------------------------|
| 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 (DSPI)     | = DSPU                     | = not used              |
| FMT 0qs        | = unit (q) and side (s)    | = not used              |
| CCB            | = side                     | = CCB No. (01-06)       |
| CCN(CCN1)      | = 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 8.2-2. Diagnostic Commands**

| <b>Circuit (Abbrev.)</b> | <b>Command</b>                            |
|--------------------------|-------------------------------------------|
| EBX                      | DGN-EQPT::MC;                             |
| MTC (MT)                 | DGN-EQPT::MC;                             |
| CI                       | DGN-EQPT::CI;                             |
| PMEM                     | DGN-EQPT::PMEM;                           |
| SYNC                     | DGN-EQPT::SYNC-a;                         |
| CRO                      | DGN-EQPT::SYNC::TLI-3:CRO;                |
| TLI                      | DGN-EQPT::SYNC-a::TLI-n;                  |
| UC                       | DGN-EQPT::UNIT-[q]q::UC;                  |
| FTMI                     | DGN-EQPT::UNIT-[q]q::FTMI-d;              |
| DSPI                     | DGN-EQPT::UNIT-[q]q::DSPI;                |
| FC                       | DGN-EQPT::UNIT-[q]q::FC-sb;               |
| CCI                      | DGN-EQPT::CCI-s;                          |
| ETSI                     | DGN-EQPT::ETSI-sqq;                       |
| CCNI                     | DGN-EQPT::CCNI-s;                         |
| CCB                      | DGN-EQPT::CCB;                            |
| TSI                      | DGN-EQPT::TSI-sft;                        |
| NPC                      | DGN-EQPT::NPC-<npc No.>::[SIDE-s][:INCL]; |
| SMEM                     | DGN-EQPT::SMEM;                           |
| LINK                     | DGN-EQPT::LINK-j;                         |
| FMT                      | DGN-EQPT::UNIT-[q]q::FMT-s;               |
| FLI                      | DGN-EQPT::UNIT-[q]q::FLI-{S P};           |
| MXR                      | DGN-EQPT::UNIT-[q]q::MXR-c                |
| MIU                      | DGN-EQPT::UNIT-[q]q::MIU-c;               |





---

**When to Use**                      Use this procedure to clear DGNDT Message 82003.

---

### **Instructions**

---

LOOK AT STEPS 1 AND 2 BEFORE READING THIS OVERVIEW. This procedure deals with the 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 after the test number on the last line of the DGNDT message.
2. If these bytes equal FF, immediately enter **STA-LOCL-RST : :PRI ;**.



**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**  
**General Task**

# 9

---

**Contents**

---

- Clear REPT ERR SOFTWARE Message

GT [9.1-1](#)

---



---

## Clear REPT ERR SOFTWARE Message

# 9.1

---

**When to Use**                      Use this procedure to clear REPT ERR SOFTWARE message.

---

### **Instructions**

---

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 REPT EVT ...ERR SOFTWARE message, 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 9.1-1 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-EQPT: :UNIT- [q]q: :UC;** for the unit number (1 through 16).
  4. If MC RESET COMPLD message (with no error explanations) or RST-COMPLD 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 reason for denial in the output message and perform corrective action to obtain command completion.
  5. Enter **DGN-EQPT: :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-EQPT: :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 error explanation occurs**, 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 **RTRV-STATE-COM: : : :ALL;**, 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 9.1-1.
    - WMBOOT - If the action was denied, enter **STA-LOCL-RST: :PMEM;**.
    - HWBOOT - If the action was denied, enter the command to restore the plug-in to service per Figure 9.1-1
    - REPORT - Respond to the COND completion or denial of the command that brought the ERR SOFTWARE message.

**verb:[xy]:<CP identification>:[ww]{} or {}<additional info.>}**

{RMV-EQPT:: SYNC-a; a = 0 or 1  
/RST-EQPT:: SYNC-a:[ww]:TLI-n[:SSP-b]; n = 1-4; b = sync port (0 or 1)  
/DISC-EQPT:: SYNC:[ww]:TB  
/DGN-EQPT:: CCI-s; s = side 0 or 1  
CCNI-s; s = side 0 or 1  
ETSI-sqq; qq = unit 01-16  
TSI-sft; f = unit (receiving from) (1-6)  
CCB-sf; t = unit (transmitting to) (1-6)  
ETSI, ECCN-s;  
UNIT-[q]q:[ww]:UC; [q]q = unit 01-16  
UNIT-[q]q:[ww]:{FTMI-d|DSP}; d = module interface 1-4  
UNIT-[q]q:[ww]:FC-sd; sd = FC side (0,1) and FC No. (1-4)  
UNIT-[q]q:[ww]:FLI-k; k = service (S) or protection (P)  
UNIT-[q]q:[ww]:FMT-s; s = side (0,1)  
UNIT-[q]q:[ww]:MMFG-c; c = DS3 group (1-6, P)  
[FRC][,INCL]; FRC = forces RMV with no prot. switch  
INCL = removes/restores MXR NPCs  
UNIT-[q]q:[ww]:MIU-c; c = DS3 group (1-6, P)  
NPC-<npc No.>:[ww]:[SIDE-s]; <npc No.> = NPC No.  
s = SIDE for DSPU  
LINK-j; j = link 1-6  
DGN-EQPT:: UNIT-[q]q:[ww]:MXR-c; c = DS3 group (1-6, P)

---

#### Figure 9.1-1. 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:**

REPT DGNDT messages may also occur because of discrepancies that result if CPY MEM ...WKG,PMEM (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.

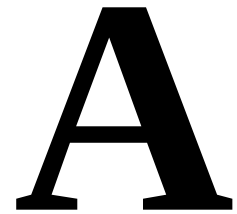
**Table 9.1-1. Software Error Explanation**

| <b>Error Type</b> | <b>Explanation</b>                                                             |
|-------------------|--------------------------------------------------------------------------------|
| 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.                              |
| <b>Action</b>     | <b>Explanation</b>                                                             |
| 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.                                     |



---

# Command Denials



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## Contents

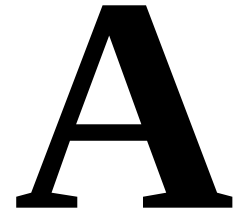
|                                |                     |
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## Command Denials



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### Background

#### Introduction

DACS II will respond with a command denial message when an incorrect command is entered, there is trouble in the system (either software or hardware), or when an operator enters a command which has been restricted by the system administrator.

---

#### Objective

This chapter provides information to recognize clear command denials.

---

## Clear Command Denials

### Overview

When a user inputs an invalid command, the DACS II system denies the command and displays a denial message. The two types of denial messages are:

- Frame Denial Message
- Hexadecimal Condition Code Message.

### Denial Message Command Strings

DACS II responds with a word strings in the denial message after a command is entered incorrectly or equipment is not operating properly. The following table provides the word string and the corrective action required to obtain command completion

| Word String            | Corrective Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, ?)<br><br> <b>NOTE:</b><br>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,<br>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 SET-PRVG command with option RMON for the user                                                                                                                                                                                                                                                                                                                                          |



## **Clear Command Denials (Continued)**

### **Subrate Denial Message**

The following table provides the corrective action required for a subrate data denial message string:

| <b>Message String</b>                          | <b>Corrective Action</b>                                                                                                                                                                                     |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exceeds Limit of 21                            | Only 21 MJUs can be disconnected at one time. Split the MJUs to be disconnected into smaller groups                                                                                                          |
| INCL Required for All Subrate Circuits         | This is a precaution to ensure that data customers are informed of maintenance action. Verify that you are addressing the correct channel and notify customers if you are going to remove service            |
| OLD Channel Not Established to Subrate Feature | The addressed channel has not been established to subrate with command established to subrate with CRTE-CRS-TS command                                                                                       |
| OLD Channel Has Associated Parity Channel      | The PCH [ppp] option must be used to indicate the next or particular parity channel                                                                                                                          |
| New Channel Not Same As Old                    | The new channel was established to Subrate differently (DS0A or DS0B). Check channel entries                                                                                                                 |
| Exceeds EC/SRM/MJU Capacity                    | For EC, use ECLOC query to find which is being used (SRM or MJU); enter command to change ECLOC. For SRM/MJU, the next plug-in is required for more capacity                                                 |
| MPTM Keyword Disallowed                        | The MPTB keyword is only valid for multipoint junction unit circuit                                                                                                                                          |
| MA Field Does Not Exist                        | The MJU entered in the MA field does not exist                                                                                                                                                               |
| ALL Keyword Is Not Specified                   | The ALL must be used when there are branches. Verify command entry                                                                                                                                           |
| Associated with RT Digroups                    | An NPC entered in the command is associated with <i>SLC</i> Carrier System; channels for these are entered as virtual channels on the DGA NPC, which allows channels 1 through 96 to be addressed on one NPC |

### **Common Causes**

Command denials can be categorized under common causes. The following table provides the denial descriptions and corrective action required to obtain command completion:

| <b>Command Denial</b>                          | <b>Corrective Action</b>                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input Error</b>                             | Check each field of the command entry on the screen or printout against the documented command to find the error                                                                                                                                                                                                                         |
| <b>Not Equipped, Not In-Service, or Failed</b> | The named equipment is not grown (equipped) or in-service to support the execution of the command. The commands to create 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.                                   |
| <b>Incorrect NPC/Channel Number</b>            | 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                                                                                         |
| <b>Invalid Parameters</b>                      | Check each field of the command entry against the documented command to determine which keyword is incorrectly used                                                                                                                                                                                                                      |
| <b>Boot Failed</b>                             | 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 |

---

## **Clear Command Denials (Continued)**

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### **DENY Output Message**

The Deny output message provides a 4-digit error code which appears on a line by itself and the remaining lines which give the explanation of the error code. Table A-1 provides the error codes.

Error codes starting with the same letter are in the same general category; for example, I for input, E for equipage, S for service. The code is taken from letters of the key words that constitute the meaning of the code.

---

(Continued on next page)

**Table A-1. mmmm Condition Codes**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENEQ       | CCB not eqd, not IS, or failed or inactive side CCB not eqd or not IS<br>CPR is not equipped<br>Copy source NPC is not equipped<br>DSPI not equipped, not in service, or failed<br>DSPU is not equipped<br>Database corrupt<br>ETSI not equipped, not in service, or failed<br>FC not eqd, not IS, or failed or inactive side FC not eqd or not IS<br>FMT not eqd, not IS, or failed, or inact side FMT not eqd, or not IS<br>FTMI not equipped, not in service, or failed<br>MIU is not equipped<br>Mate NPC is not equipped<br>NPC not equipped<br>NPC not provisioned as DGA<br>NPCTG not grown<br>NPCTP is not grown<br>No CBTYPE NPC equipped<br>No DSP unit equipped<br>Not enough DSPPs are equipped<br>Protection MIU is not equipped<br>Protection entity is unequipped<br>Required FLI not equipped, not in service, or failed<br>Required MIU not equipped, not in service, or failed<br>Required MXR not equipped, not in service, or failed<br>SYNC TB is not equipped<br>Service MXR is not equipped<br>Subject entity is not equipped<br>Sync source NPC is not equipped<br>TSI not eqd, not IS, or failed or inactive side TSI not eqd or not IS<br>The MXR is not grown<br>The pair MXR is not equipped<br>Unit not equipped, not in service, or failed<br>Test group unequipped<br>Virtual SLC NPC not provisioned |
| ENFE       | Cross-connect not consistent with feature package<br>Software does not contain Enhanced CEPT feature<br>Subject NPC does not support CEPT BER feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ENIE       | Option rr/m has not been set up on 2nd database<br>Termination is not connected as indicated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ENRE       | Two confs. were prev. connected or the concat. cause BRD-BBL loop<br>Corresponding NPC for FROM virtual channel is not provisioned<br>Corresponding NPC for TO virtual channel is not provisioned<br>Corresponding NPC for virtual channel is not provisioned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | FROM NPC is not provisioned as DGA                                |
|            | Illegal connectivity specified                                    |
|            | NPC not provisioned for CAS                                       |
|            | NPC not provisioned for NSA                                       |
|            | PMEM type no longer supported                                     |
|            | SMEM is a normal SMEM                                             |
|            | SSC circuit pack is still equipped; pull-out/remove SSC           |
|            | Subject entity is equipped                                        |
|            | TO NPC is not provisioned as DGA                                  |
| ERLC       | Attempt to remove DGA w/o INCL keyword or prior prot. sw. request |
|            | Customer control or red circuit exists                            |
|            | DGA protected; use INCL to remove, or unswitch protection         |
| ICNV       | PM scheduling report is already allowed for this entity           |
|            | PM scheduling report is already inhibited for this entity         |
|            | TS0 is crossconnected to TS0                                      |
|            | Bit value not allowed for NPC type                                |
|            | Current error corrector pack type specified in command            |
|            | Current Hub id specified in command                               |
|            | not allowed for clear 2MB                                         |
| IDMS       | Both FAC and PRIM values(keywords) are required                   |
|            | INCL keyword needed to perform this command                       |
|            | INCL must be specified for SRDC ckts                              |
|            | SIDE must be specified for substrate NPC                          |
|            | Some priority values required                                     |
|            | Unspecified L2 address                                            |
| IDNC       | FDL selected with width not 1                                     |
|            | Inconsistent or invalid circuit type for Nx64Kbit TA              |
|            | Old or new is a non-channelized type in a DS0 command             |
|            | One NPC is a non-channelized type and the other is not            |
|            | Some priority values not required                                 |
|            | TG width incompatible with circuit                                |
|            | The two FADS entered are not associated with one another.         |
|            | Incompatible HUB feature types                                    |
|            | Inconsistent BCON width for test access                           |
|            | Inconsistent HUB width for specified TG                           |
|            | Invalid channel designation for BCON                              |
|            | Not all FROM channels on same NPC                                 |
| IDNV       | A locally switched channel is specified as BBL, LEG, or BRD       |
|            | A substrate circuit pack is specified in the command line         |
|            | AIS entered for MONE/MONF/MONEF/SPLTA/SPLTB/SPLTAB                |
|            | AIS invalid for cross-connection specified                        |
|            | AIS keyword incompatible with NPC type                            |
|            | Adding two digroups from one bank on same DDC                     |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                    |
|------------|-----------------------------------------------------------------------|
|            | Alarm option and bank mode don't match                                |
|            | All NPC(s) are either not valid or not grown                          |
|            | Attempt to broadcast a locally switched channel                       |
|            | Attempt to one way cross-connect a locally switched channel           |
|            | BER must not be less than 4 for Clear DS1                             |
|            | Bad PRIM X'efgh values                                                |
|            | Bank id number not found                                              |
|            | CPR circuit pack specified in the command                             |
|            | Can't Use LCN 0/LGN 0 - designated as a supervisory channel only      |
|            | Can't delete because not all associated NPCs of the RT are entered    |
|            | Command not allowed                                                   |
|            | Conference first channel doesn't match input                          |
|            | Conference port cannot be dropped out of conference by switch command |
|            | Conference port is not in conference circuit                          |
|            | Connectivity can not be specified for CEF unit                        |
|            | Counting sequence and operational mode don't match                    |
|            | Cross-connect a non Mode I channel to DCLU                            |
|            | Cross-connect a non SLC channel to DCLU                               |
|            | DGA and DGB must be specified together in the command                 |
|            | DGA with NDL option is not provisioned with D4 or ESF framing format  |
|            | DGA/DGP of RT/DL Mode I must be assigned to one DDC                   |
|            | DGC and DGD must be specified together in the command                 |
|            | DGP designated to bank without data link                              |
|            | Digroup name and bank id don't match                                  |
|            | Digroups from same bank are added to two different FTUs               |
|            | Digroups from same bank have different counting sequence              |
|            | Digroups from same bank have different modes                          |
|            | Duplicate L2 address                                                  |
|            | Duplicate ports specified                                             |
|            | ENQ/ACK flow control is supported only on Snider link                 |
|            | Error in input                                                        |
|            | Framing format, digroup name & operational mode don't match           |
|            | INCL not specified and at least one NPC In Service                    |
|            | IU type NPC(s) cannot be provisioned for Minor Alarm                  |
|            | IW option is not allowed for new type of Clear-DS1 NPC                |
|            | Inconsistent Signaling on CEPT NPCTGs                                 |
|            | Inconsistent channel range width                                      |
|            | Invalid CEPT NPC                                                      |
|            | Invalid CFT code                                                      |
|            | Invalid FPI value                                                     |
|            | Invalid FROM channel number                                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Invalid MIU/MXR type specified                                      |
|            | Invalid NPC addressing scheme specified                             |
|            | Invalid SLC Mode-III channel number                                 |
|            | Invalid TC specification                                            |
|            | Invalid TO channel number                                           |
|            | Invalid channel 000 cross-connection specified                      |
|            | Invalid channel 031 cross-connection specified                      |
|            | Invalid channel number                                              |
|            | Invalid circuit type                                                |
|            | Invalid keyword(s) combination specified                            |
|            | Invalid line number                                                 |
|            | Invalid link number specified                                       |
|            | Invalid poll time                                                   |
|            | Invalid switch request for DCLU                                     |
|            | Leg type mismatch                                                   |
|            | MUX or TRB invalid for cross-connection specified                   |
|            | Mode I RT/DL IDs don't match for DGA/DGP on same DDC                |
|            | NAM invalid for cross-connection specified                          |
|            | NDL option is specified for DGA                                     |
|            | NDL option is used without DGA                                      |
|            | NPC containing channel 000 is invalid type.                         |
|            | NPC is a DGP                                                        |
|            | NPC is channelized type                                             |
|            | NPC is not part of a one-way connection                             |
|            | NPC number and bank id don't match                                  |
|            | NPC number and digroup name don't match                             |
|            | NPC parameter only valid with TU type TLI                           |
|            | NPC type is not DS type                                             |
|            | NPC type option Y is invalid for SLC-96 NPC                         |
|            | NPC used as a timing reference                                      |
|            | NPC(s) actual type incompatible with TYPE keyword and/or alarm type |
|            | No OOS keyword is given for out-of-service NPC                      |
|            | No PM data available                                                |
|            | No mapped circuit under test; emode/fmode can't be changed.         |
|            | Number of transmitting ports does not match existing conference     |
|            | OLD and NEW Data and Parity channels partially overlap              |
|            | OLD and NEW channels cannot be the same                             |
|            | OLD data channel cannot be parity channel type                      |
|            | Old and new are the same NPC in a DS1 command                       |
|            | One-way circuit under test; emode can't be changed.                 |
|            | Operation mode and digroup name don't match                         |
|            | Option not programmable for this NPC type                           |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b>  | <i>Explanation</i>                                                     |
|-------------|------------------------------------------------------------------------|
|             | PWR/MISC alarm is specified to a digroup other than DGA                |
|             | Parameter only valid with PA, PB, or PC type NPCs                      |
|             | RT-DCLU cross-connect with different channel number                    |
|             | RT-DCLU cross-connect with different ids                               |
|             | RTF keyword and the operation mode does not match                      |
|             | RTF keyword is used without DGA                                        |
|             | Range entered without FRC keyword                                      |
|             | Range not allowed for circuit type                                     |
|             | SC invalid for cross-connection specified                              |
|             | Selectable AIS not valid for specified NPC(s) type                     |
|             | Side specified for non-duplicated NPC                                  |
|             | Signaling processing is not activated for the channel                  |
|             | Superuser logged on                                                    |
|             | TG East/West type inconsistent with each other or circuit              |
|             | TS0 specified with width not 1                                         |
|             | TS16 specified for CAS TG                                              |
|             | TS16 specified for test with width not 1                               |
|             | The RT id entered is not a retrofit one                                |
|             | The common bit(s) is(are) not set in both FAC & PRIM                   |
|             | The facility parameter not programmable for specified x or z parameter |
|             | The parameter specified does not match with the NPC type               |
|             | The specified parameter is not applicable to operation mode of the RT  |
|             | Trunk type is not allowed in the circuit specified                     |
|             | Unmatched channel range                                                |
|             | Unmatched channel range involving SLC Mode III termination             |
|             | Unrunnable CFT code                                                    |
|             | Using the 24th channel of a DMI NPC                                    |
|             | Using the 24th channel of a T1DM NPC                                   |
|             | Virtual circuit is not specified for X.25 link                         |
|             | XON/XOFF flow control is supported only on Snider link                 |
|             | ZBTSI option is only valid with the ESF mode                           |
|             | Emode/fmode can't be changed under current test mode.                  |
|             | x & z parameters on DSxyz are inconsistent                             |
| <b>IDRG</b> | Command did not execute for any entity specified in the command        |
|             | Ending channel is out of range                                         |
|             | First and Last NPCs are outside a module boundary                      |
|             | First and Last NPCs are outside unit boundary                          |
|             | Invalid FROM channel number range                                      |
|             | Invalid TO channel number range                                        |
|             | Invalid range for specified FROM NPC type                              |
|             | Invalid range for specified NPC type                                   |
|             | Invalid range for specified TO NPC type                                |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | NPC range crosses unit boundary                                      |
|            | OFFSET range is invalid                                              |
|            | Old and New channel on same NPC and within the range                 |
|            | Only up to 4 historical data registers are allowed                   |
|            | TG width too large for single NPCTG                                  |
|            | Threshold value is out of range                                      |
|            | Unit type (xyz) not supported                                        |
|            | input channel out of range (SLC not supported)                       |
| IICM       | Clear gateway test access disallowed.                                |
|            | SRDC timeslots are allocated on this NPC                             |
| IIDT       | AIS not entered for SPLTE/SPLTF/SPLTEF/LOOPE/LOOPF                   |
|            | Database conference width does not match the range in input command  |
|            | Illegal BBL BBL combination                                          |
|            | Illegal BBL SYM combination                                          |
|            | Illegal BRD BRD combination                                          |
|            | Illegal BRD SYM combination                                          |
|            | Illegal LEG LEG combination                                          |
|            | Illegal SYM BBL combination                                          |
|            | Illegal SYM BRD combination                                          |
|            | Invalid change from previous mode                                    |
|            | Invalid change parameter combinations                                |
|            | Invalid input BBL as fmd in ONE-WAY command                          |
|            | Invalid input BBL in terminated TWOWAY/ONEWAY command                |
|            | Invalid input BRD as tmd in ONE-WAY command                          |
|            | Invalid test mode for a one-way test session                         |
|            | Invalid test mode for an unmapped test session                       |
|            | Invalid use of CONV keyword                                          |
|            | NPC is a channelized NPC                                             |
|            | NPC is a non-channelized NPC                                         |
|            | NPC is not a F-end                                                   |
|            | NPC is not a Facility Access Digroup                                 |
|            | NPC is not an E-end                                                  |
|            | NPC type mismatch                                                    |
|            | No NPC's out of service and OOS keyword used                         |
|            | No RDLT or CUS circuits and INCL keyword used                        |
|            | Report interval is not an integral number of accumulation interval   |
|            | TO side is not a DMB type NPC                                        |
|            | This NPC type does not allow unframed Clear-DS1                      |
|            | Transmission parameters in command will not change existing settings |
|            | Trunk conditioning is invalid                                        |
| IIFM       | Bad FAC value entered                                                |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | Exceeded depth limit of 6 on broadcast conference concatenation   |
|            | FMC cannot be cross-connected in this format                      |
|            | Invalid FROM NPC type for AIS insertion                           |
|            | Invalid NPC type for AIS insertion                                |
|            | Invalid TO NPC type for AIS insertion                             |
|            | Try to operate a ONE-WAY conference with a TWO-WAY input command  |
|            | Try to operate a TWO-WAY conference with an ONE-WAY input command |
| IPNV       | Accumulation Interval field is missing                            |
|            | Accumulation Interval field is not allowed                        |
|            | FAC keyword is invalid for this feature                           |
|            | Historical data can not be specified                              |
|            | Interval is not valid/not available                               |
|            | Invalid direction specified for NTST TLA/TLR                      |
|            | Invalid parameter combination                                     |
|            | Invalid use of INCL keyword                                       |
|            | Level field is not allowed                                        |
|            | MONDAT keyword is invalid for this feature                        |
|            | MONDAT set to ALL is not allowed                                  |
|            | MONTIM set to ALL is not allowed                                  |
|            | Mismatch between channel 0 crossconnect and keywords              |
|            | Monitored Date field is not allowed                               |
|            | Monitored Time field is not allowed                               |
|            | NPC is non-channelized                                            |
|            | NPC number out of range                                           |
|            | No PM data available                                              |
|            | Only 15MIN for accumulation interval is allowed                   |
|            | Only DAILY for accumulation interval is allowed                   |
|            | Only historical data can be specified                             |
|            | Only one parameter is allowed                                     |
|            | PRIM keyword is invalid for this feature                          |
|            | Scheduled reporting for this npc is inhibited                     |
|            | Scheduling report could not be found                              |
|            | The MONDAT and MONTIM parameters can not both be specified        |
|            | This NPC type does not allow Payload                              |
| NCON       | No conditions                                                     |
| SAAL       | Feature is active                                                 |
|            | Manual Pending is Active                                          |
|            | PA NPC threshold already in allow mode                            |
|            | Protection switching is already allowed                           |
|            | The switch is allowed (not inhibited)                             |
| SAAS       | All channels assigned, cannot be grown as NPCTG                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Another NPC is grown and added as this digroup                      |
|            | BCON BBL has one or more legs under test                            |
|            | Channel(s) is already registered                                    |
|            | Channels assigned, cannot be grown as test group                    |
|            | Channels assigned, cannot be grown as test port                     |
|            | Conference Port is currently registered to a different channel      |
|            | New bank id is an assigned one                                      |
|            | TG number previously assigned                                       |
|            | Termination is already assigned                                     |
|            | Termination is in process of being rolled                           |
|            | The MIU is already equipped                                         |
|            | Channel already under test                                          |
|            | Channel part of a TP or TG                                          |
|            | Circuit contains mapped channels for HUB request                    |
| SAIN       | Loop back inhibited for digroup                                     |
|            | No mapped slots on a tsi                                            |
|            | No unmapped slots on a bus                                          |
|            | PA NPC threshold already in inhibit mode                            |
|            | Parity channel cannot be within the range of a DS0 command.         |
|            | Protection switching is already inhibited                           |
|            | Subject entity is pested                                            |
|            | Termination is under test or is a test port or group                |
|            | The switch is already inhibited                                     |
|            | Can't change option, inhibition is active                           |
| SAIS       | Both syncs are in-service                                           |
|            | CCN side s is in service                                            |
|            | CRO is still equipped                                               |
|            | Conference already exists                                           |
|            | DS3U NPC already In-Service                                         |
|            | DSPI is in service                                                  |
|            | MIU is already in service                                           |
|            | Mate NPC (DGA/DGP) is in service                                    |
|            | NPC not IU/TI type                                                  |
|            | Some TLIs are still equipped                                        |
|            | Some TSIs to degrow are in service                                  |
|            | Subject entity is in service                                        |
|            | TLI 3 or 4 still equipped                                           |
|            | Test group is not idle or frame is not In Service                   |
|            | Test port is not idle or frame is not inservice                     |
|            | The MMFG is already In-Service                                      |
|            | The MXR is in service                                               |
|            | The selected FLI is IS and Pested and at least 1 Service MXR is eqd |
| SAOP       | RT's alarm exists                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                             |
|------------|----------------------------------------------------------------|
| SAOS       | This signal is already being sent                              |
|            | A DMB on the Unit is OOS                                       |
|            | Both syncs are out-of-service                                  |
|            | CCB is out of service                                          |
|            | CCI is out of service                                          |
|            | CCN side s is out of service                                   |
|            | CCNI is out of service                                         |
|            | DSPI out-of-service                                            |
|            | ETSI is out of service                                         |
|            | FC out of service                                              |
|            | FLI is out of service                                          |
|            | FMT is out of service                                          |
|            | FTMI is out of service                                         |
|            | File has already been cleared                                  |
|            | Formatter (FMT) on active CCN side is Out-Of-Service           |
|            | IU/TI type NPC failed                                          |
|            | MIU is out of service                                          |
|            | MXR is out of service                                          |
|            | Mate CCN side is out of service                                |
|            | Mate SYNC is out of service                                    |
|            | NPC out of service or failed                                   |
|            | Protection MIU is out of service                               |
|            | Protection MXR is out of service                               |
|            | Protection entity out of service or failed                     |
|            | SYNC is out of service                                         |
|            | Service MIU is out of service                                  |
|            | Service MXR is out of service                                  |
|            | Subject entity is out of service                               |
|            | Sync 0 is not in-service                                       |
|            | Sync 1 is not in-service                                       |
|            | The MMFG is Out Of Service                                     |
|            | The mate FLI is OOS and Protection MIU is equipped             |
|            | The mate FLI is OOS and Protection MXR is IS                   |
|            | The mate FLI is OOS and at least one Service MXR is equipped   |
|            | The protection FLI is out of service or pested (TOPRTN option) |
|            | The selected MIU associated with the NPC is Out-Of-Service     |
|            | The selected MXR associated with the NPC is Out-Of-Service     |
|            | The service FLI is out of service or pested (TOSRVC option)    |
|            | UC is out of service                                           |
| SAPS       | Frame ID is protected                                          |
|            | The Service MMFG is already under protection                   |
|            | The protection FLI is already selected (TOPRTN option)         |
|            | Can't change option, protection switch is active               |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SAPV       | Option LOCAL already exists<br>Option REMOTE already exists                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SARB       | Exceeded limit of reports with accum. interval of 15 min. or less<br>Exceeded maximum limit of PM reports                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SARL       | No FADs were activated by link n<br>No test ports were activated by link n                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SATF       | Can't run test on active side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SAWS       | An autonomous switch is in progress<br>C-bit modify function is active<br>C-bit operations are enabled<br>Conference exists in a DMB<br>Mapped slots exist on a tsi<br>NPC already allocated as sync timing source<br>NPC already grown as non-synchronization source<br>NPC already has Equipment Loopback<br>NPC is already grown and added as SLC digroup<br>The Service MMFG is not under protection<br>The service FLI is already selected (TOSRVC option)                                                                        |
| SNAS       | Connectivity contains unequipped units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SNIS       | CPR is out of service<br>Cannot clear journals for OOS unit<br>DSPU unit controller is out of service<br>NPC is OOS for a TGR command and OOS keyword not specified<br>NPC unequipped, out of service or failed<br>RT/DL has unrestored DGA<br>Sync source NPC is not inservice<br>TD on one(both) sync(s) is not equipped or not in-service<br>Unit(s) OOS, and additional backup required                                                                                                                                            |
| SNOS       | In-service NPC change not allowed<br>Subject PWR to be cleared is not failed                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| SNVS       | (Timing Distributor) TLI is not equipped<br>1 hr >= 24 hr for DM opt<br>15 min >= 24 hr for ERS opt<br>15 min >= 24 hr for SERS opt<br>15 min >= 24 hr for SLIP opt<br>15 min >= 24 hr for US opt<br>3 Timing Distributor type TLIs are equipped<br>A DMB mode was assigned to a FTU-type NPC on the input<br>A loopback is active on the FROM termination<br>A loopback is active on the TO termination<br>A user is already logged in on the link/vc<br>Active CCN side is out of service<br>Adding DL DGP forbidden for SLC 96 MD 1 |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Alarm bits cannot be passed through or inverted                      |
|            | All digroups not out of service                                      |
|            | Another signal already active prevents this signal from being sent   |
|            | Assignment of single priority to multiple SSPs                       |
|            | At least one UC is OOS or At least one UC is failed                  |
|            | At least one UC is not the correct type                              |
|            | Attempt to add to a null transmitting port                           |
|            | Attempt to remove a Service MIU which is under protection            |
|            | Attention: preceding ccode 83 is an anomaly - see problem list       |
|            | Autonomous loopback is active on DGA                                 |
|            | Backup required before executing this command                        |
|            | Bad sync mode                                                        |
|            | Bad use of INCL, cannot override the current state of the conference |
|            | Bad use of INCL, cannot use keyword on conf.-to-conf. connection     |
|            | Bit 3 provisioned for use as RAI3                                    |
|            | Bit 4 provisioned for use as RAIS                                    |
|            | Bit 4 provisioned for use as RBER                                    |
|            | Bit 5 provisioned for use as SFI                                     |
|            | Bit c not settable                                                   |
|            | Bits 3 through 8 are provisioned for Transmic 1G                     |
|            | Boot in progress, can't service request                              |
|            | Both ITS TG bundles must be on same TG193B card                      |
|            | Both sides of CCN are OOS                                            |
|            | Broadcast unassigned channel/NPC in QRY,TO                           |
|            | C-bit modify function is disabled                                    |
|            | CATP due to skipping continuity test for FMT                         |
|            | CCB is inservice but failed                                          |
|            | CCI is inservice but failed                                          |
|            | CCI is not present                                                   |
|            | CCNI is inservice but failed                                         |
|            | CPR in buffer overflow condition                                     |
|            | CRO type TLI (SSP portion not required)                              |
|            | CUS flag doesn't match that of conference                            |
|            | Can not create any more users                                        |
|            | Can not execute privileged command                                   |
|            | Can not perform DMB CHG on input direction A                         |
|            | Can not perform DMB CHG on input direction B                         |
|            | Can not perform DMB CHG on input direction F                         |
|            | Can not perform DMB CHG on input direction G                         |
|            | Can not perform DMB CHG on input direction L                         |
|            | Can not perform DMB CHG on input direction T                         |
|            | Can not remove Frame administrator                                   |
|            | Can not remove own link                                              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Can not use 12-th TP when NPCTP is in the T1DM or DMI mode          |
|            | Can't disconnect return leg unless entire conference disconnected   |
|            | Can't mount or unmount BOTH_MEM                                     |
|            | Can't mount or unmount PMEM                                         |
|            | Can't mount or unmount SMEM                                         |
|            | Can't mount or unmount password recovery card                       |
|            | Can't perform DMB CHG because NTR flag set on FROM side             |
|            | Can't perform DMB CHG because NTR flag set on TO side               |
|            | Can't RST MC CLR when a unit is equipped                            |
|            | Can't start new session - previous session still verifying          |
|            | Change not valid                                                    |
|            | Change to T1DM digroup with cross-connect that is not TRSP          |
|            | Change to non-ESF digroup with 16-state cross-connect               |
|            | Channel has a FAR, which is within the range                        |
|            | Channel or NPC not bridged                                          |
|            | Channel out of bound in a BCON/v.c                                  |
|            | Channels and conference port do not match                           |
|            | Clock absent for XPC to loop back                                   |
|            | Combination of bit g (b7) and h (b8) is invalid                     |
|            | Command and protocol are inconsistent                               |
|            | Command invalid while backup in progress                            |
|            | Command is Frame administrator (DAX) only.                          |
|            | Conference Port is already registered to the same group of channels |
|            | Conference is LPD: has no switchable return leg                     |
|            | Conference is NTR: has no switchable return leg                     |
|            | Conference port is currently connected                              |
|            | Conference port is not registered                                   |
|            | Conversion leg is terminated                                        |
|            | Cross-connect to CPR is required                                    |
|            | Customer controlled circuit, INCL not entered                       |
|            | DB MP or units ram error                                            |
|            | DB retrofit fail                                                    |
|            | DCTN conference channel cannot be rolled                            |
|            | DGA is not added                                                    |
|            | DGN on subject entity denied                                        |
|            | DGP is protecting a primary digroup                                 |
|            | DL ffff is used w/ operational mode other than Mode I               |
|            | DMI combined with T1DM                                              |
|            | DSPP not in service, or failed                                      |
|            | DSPP pack FTMI Failed or Out of Service                             |
|            | DSPP pack NPC Failed or Out of Service                              |
|            | DSPP pack UC Failed or Out of Service                               |
|            | Database is empty                                                   |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                                                 |
|------------|----------------------------------------------------------------------------------------------------|
|            | Database is not empty                                                                              |
|            | Database not loaded                                                                                |
|            | Delete or change a leg from a conference that has no leg                                           |
|            | Deny Clear-2MB for Alternate Maps                                                                  |
|            | Deny SLC for Alternate maps                                                                        |
|            | Deny SP Type NPCs for Alternate Maps                                                               |
|            | Deny non-channelized NPCs for Alternate Maps                                                       |
|            | Designated TG or circuit to be tested in process of being rolled                                   |
|            | Different DSxyz types are used for DGA/DGP on same DDC for Mode I                                  |
|            | Digroup is protected                                                                               |
|            | Disable not allowed - supports another feature                                                     |
|            | ETSI cannot be initialized when ECCN side is OOS or inservice but<br>pested                        |
|            | ETSI is inservice but failed                                                                       |
|            | ETSI is not present                                                                                |
|            | Entity can't be addressed in this configuration                                                    |
|            | FC is inservice but failed                                                                         |
|            | FLI is inservice but failed                                                                        |
|            | FMT is in service but failed                                                                       |
|            | FPI on SMEM does not match one on PMEM                                                             |
|            | FRC specified for protection, and service MMFG is In Service                                       |
|            | FROM is a two-way and no CONV specified                                                            |
|            | FROM is not a backbone leg                                                                         |
|            | FTMI is PESTED                                                                                     |
|            | FTMI is in service but failed                                                                      |
|            | FTMI type error                                                                                    |
|            | Feature deactivation would leave system with core software                                         |
|            | Feature not enabled                                                                                |
|            | File already exists                                                                                |
|            | File doesn't exist/can't be accessed                                                               |
|            | File is being accessed                                                                             |
|            | File is empty                                                                                      |
|            | Firmware timing invalid for Transmic 1G NPC                                                        |
|            | Flash Card is bad                                                                                  |
|            | Flash Card is empty                                                                                |
|            | Flash Card is not present                                                                          |
|            | Frame is not in MCOND                                                                              |
|            | Frame time is not set                                                                              |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Automatic CRC-4                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Firmware Timing                                      |
|            | Framed/Unframed clear 2Mbit/s NPC invalid for Transmic 1G, 2G<br>G1 SMEM for SMEM->PMEM w/journals |



**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                             |
|-------------|----------------------------------------------------------------|
|             | G4 to G4.1 retrofit failed                                     |
|             | Gateway test access not supported                              |
|             | Hardware mismatch or not present                               |
|             | INCL keyword needed when restricted Insertion Word specified   |
|             | IW is UMUX (18) but NPC not type DE4yz                         |
|             | IW not allowed to be specified in Clear 2Mbit/s                |
|             | Illegal SSP type (not same as other SSPs)                      |
|             | Illegal priority value                                         |
|             | Illegal test access mode for TS0                               |
|             | Illegal test access mode for TS16                              |
|             | Improper roll command sequence                                 |
|             | Inactive side NPC out of service and inactive side in service  |
|             | Incompatible types of NPCs on a circuit pack                   |
|             | Incorrect language/addressing mode                             |
|             | Incorrect number of parameters                                 |
|             | Incorrect or missing password                                  |
|             | Incorrect pack type in slot                                    |
|             | Initialization of application in progress, retry command later |
|             | Input BRD (BBL) has same NPC and channel as BBL (BRD)          |
|             | Insufficient data for setting up a conference                  |
|             | Integrated Test Set is currently active on TG                  |
|             | Invalid NPC number specified                                   |
|             | Invalid PWR/MISC alarm level                                   |
|             | Invalid combination of "x" and "y" values                      |
|             | Invalid combination of "x" and "z" values                      |
|             | Invalid executable on card                                     |
|             | Invalid option, mailbox or flag                                |
|             | ITS NPC Hardware Error                                         |
|             | ITS TG Already Generating                                      |
|             | ITS TG Already Monitoring                                      |
|             | ITS TG is Idle                                                 |
|             | ITS TG Not Generating                                          |
|             | ITS TG Not Monitoring                                          |
|             | LEG mode was assigned to a DSPU-type NPC on the input          |
|             | LLB not initiated                                              |
|             | LPD invalid since existing conference is not already LPD       |
|             | Language "F" provisioned for this channel                      |
|             | Language is not allowed                                        |
|             | Last link in service                                           |
|             | Line Loop Back is active                                       |
|             | Line format types are incompatible                             |
|             | Link being used is not Link 1                                  |
|             | Logical conflicts found in the map                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                                         |
|-------------|----------------------------------------------------------------------------|
|             | Looped Circuit Access not allowed                                          |
|             | MP database not consistent with Configuration file                         |
|             | Major/Minor BER threshold value is invalid for SLC NPCs                    |
|             | Maj Min BER threshold is 7, but not in T1DM or Fe mode                     |
|             | Map/macro file write deferred until backup is completed                    |
|             | Mapped parity channel(s) on new                                            |
|             | Mate RT/DL mode is different                                               |
|             | Mate sync pack denied command                                              |
|             | Maximum number of CPRs have already been grown for this unit               |
|             | Minor <= major for BER opt                                                 |
|             | Minor >= major for COFA opt                                                |
|             | Minor >= major for SLIP opt                                                |
|             | Minor Slip threshold disabled before Major Slip threshold                  |
|             | Mismatch between MXR and NPC types                                         |
|             | Mismatch between service MXR and protection MXR types                      |
|             | New NPC already cross-connected or mapped channel(s) exist<br>on New       |
|             | NPC addressing scheme selected is not allowed in the configuration<br>file |
|             | NPC as 12th test port can not change to DMI nor T1DM                       |
|             | NPC has active circuit                                                     |
|             | NPC has been designated as NPCTG                                           |
|             | NPC has been designated as NPCTP                                           |
|             | NPC invalid type                                                           |
|             | NPC is NPCTG and chan 24 is used in a TG; Can't change to T1DM<br>or DMI   |
|             | NPC is NPCTG, changing to CAS/NSA is not allowed                           |
|             | NPC is a Facility Access Digroup                                           |
|             | NPC is a test port                                                         |
|             | NPC is not a NPCTG                                                         |
|             | NPC is not a NPCTP                                                         |
|             | NPC is not added                                                           |
|             | NPC is not designated for this NPCTP/NPCTG                                 |
|             | NPC is still provisioned to provide sync timing                            |
|             | NPC not DA or TA type.                                                     |
|             | NPC not deleted                                                            |
|             | NPC not designated as sync timing source                                   |
|             | NPC providing timing to inservice SSP                                      |
|             | NPC type error                                                             |
|             | NPC type is inconsistent with FTMI type                                    |
|             | NPC type option xyz is unassigned or invalid for feature package           |
|             | NTR invalid since existing conference is not already NTR                   |
|             | New NPC same as existing one                                               |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | New in CGA or PBA                                                   |
|            | No CBTYPE NPC capacity remaining                                    |
|            | No DL digroups can be added until the associated RT bank is created |
|            | No Facility Line Interface (FLI) is In Service                      |
|            | No SAFE alarm for DGP                                               |
|            | No available timeslots on any inservice NPCS associated with FC/FMT |
|            | No edit session active                                              |
|            | No equalization for CEPT FTMI                                       |
|            | No macro is currently executing                                     |
|            | No mapped channel on old                                            |
|            | No protection switch is currently active                            |
|            | No signals active                                                   |
|            | No unmapped time slot                                               |
|            | No user is logged in on the link/vc                                 |
|            | No user/link needs to be changed                                    |
|            | No zeros allowed for DAX privilege                                  |
|            | Not Timing Extractor type TLI (not SSP)                             |
|            | Not a CRO TLI                                                       |
|            | Not a DACS II compatible Flash Card                                 |
|            | Not enough DSPPs are in service                                     |
|            | Not enough TSIs for CCB test                                        |
|            | Not first channel in a BCON/virtual conf                            |
|            | Not valid for frame administrator                                   |
|            | Number of DGPs on each unit is limited to 32                        |
|            | Number of SLC RT's on each unit is limited to 80                    |
|            | OLD termination is not mapped                                       |
|            | Obsolete circuit type                                               |
|            | Old and new channels have not been paired by a BCAST command.       |
|            | One of the FAR end channels is being rolled                         |
|            | One of the far NPC(s) is SLC                                        |
|            | One or more FADs could not be released                              |
|            | One or more test ports could not be released                        |
|            | One way unassigned channel/NPC in QRY,TO                            |
|            | Only one channel allowed to have this language                      |
|            | Option NOT leg can not appear with F, T, or B                       |
|            | Option NOT leg is not a FTU leg                                     |
|            | Option NOT leg is not in conference                                 |
|            | Other FLI is OOS                                                    |
|            | Other NPC on this DDC not the same digroup for Mode I DGA/DGP       |
|            | PDI Version number mismatch                                         |
|            | PMEM and SMEM are different                                         |
|            | PMEM and SMEM synchronization fail                                  |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                |
|------------|-------------------------------------------------------------------|
|            | PMEM error, boot from SMEM                                        |
|            | PMEM not in service or not ready                                  |
|            | PMEM not restored                                                 |
|            | Parity channel out of bound on new                                |
|            | Password recovery card is not READ-only                           |
|            | Point number mismatch                                             |
|            | Priority values are same                                          |
|            | Problem occurred while accessing BOTH_MEM                         |
|            | Problem occurred while accessing PMEM                             |
|            | Problem occurred while accessing SMEM or unformatted SMEM         |
|            | Protection switch existing is autonomous                          |
|            | RCV continuity test won't be run: SYNC OOS or pested              |
|            | RCV continuity test won't be run: at least one timeslot in use    |
|            | RCV continuity test won't be run: no DMB timeslots available      |
|            | RCV continuity test won't be run: no available IS NPCS for FC/FMT |
|            | RDLD flag doesn't match that of conference                        |
|            | RTBC conference exists                                            |
|            | Range overlapping between FROM and TO or between two TOs          |
|            | Ranges of old and new do not match                                |
|            | Reading Feature Package Id from PMEM failed                       |
|            | Red circuit, INCL not entered                                     |
|            | Release number mismatch                                           |
|            | Report already exists                                             |
|            | SLC 96 MD 1 RT DGP requires mate NPC to be unequipped             |
|            | SMEM error, boot from PMEM                                        |
|            | SMEM is not present                                               |
|            | SMEM unit is not restored                                         |
|            | SR NPC was specified - not allowed                                |
|            | SSC Diagnostic Failure                                            |
|            | SSP number is illegal                                             |
|            | SSP number required                                               |
|            | SSP type(options) same                                            |
|            | SSP with 0 priority present                                       |
|            | SSP with non 0 priority present                                   |
|            | SYNC is inservice but failed                                      |
|            | Signaling state of the trunk failed for the channel               |
|            | Skip error summary since adjacent pack not in service or pested   |
|            | Software Identification Block failed comparison                   |
|            | Software Identification Block is not readable                     |
|            | Some associated NPCs are equipped                                 |
|            | Some circuits not activated,cleared or pictured                   |
|            | Source does not contain requested information                     |
|            | Specified width does not match existing conference width          |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                  |
|------------|---------------------------------------------------------------------|
|            | Stratum not allowed                                                 |
|            | Sync architecture different                                         |
|            | Sync architecture is same                                           |
|            | Sync mode is same                                                   |
|            | Sync stratum is same                                                |
|            | Syncs are equipped                                                  |
|            | System macro/map space is full                                      |
|            | T1DM or DMI mode and channel 24 is connected                        |
|            | TB type in hardware mismatches DB                                   |
|            | Termination is a test port                                          |
|            | Termination is protected (RDLD)                                     |
|            | Termination is under customer control (CUS)                         |
|            | Termination is under test                                           |
|            | Test ports must be on CAS                                           |
|            | Test session already exists                                         |
|            | Testport/testgroup channel cannot be rolled                         |
|            | TG in TSM ON mode                                                   |
|            | TG not in TSG ON mode                                               |
|            | TLA/TLR invalid with ITS test groups                                |
|            | TO is a part of the same conference as a previous TO                |
|            | TO is already the return leg                                        |
|            | TO is not a leg of this/any conference                              |
|            | TO is the backbone leg of a conference                              |
|            | TO side of two-way to be converted is not an FTU NPC                |
|            | The INCL keyword is needed for DGA                                  |
|            | The MMFG is protected                                               |
|            | The NDL options are different for DGA's on the same DDC for Mode I  |
|            | The NPC of VC BBL leg doesn't match that in the input command       |
|            | The NPC to delete has not been previously added to map              |
|            | The OLD or NEW NPC is already being rolled.                         |
|            | The associated MMFG is under protection (for Service MIUs)          |
|            | The associated MXR is In-Service but pested                         |
|            | The conference does not exist                                       |
|            | The first channel of VC BBL leg doesn't match that in the input cmd |
|            | The first channel of VC BRD leg doesn't match that in the input cmd |
|            | The input BRD leg is not in VC                                      |
|            | The map is not valid                                                |
|            | The mode of the RT is not applicable                                |
|            | The reference map does not exist                                    |
|            | The requested digroup is carrying service                           |
|            | The selected MIU associated with the NPC is In-Service but failed   |
|            | The selected MXR associated with the NPC is In-Service but failed   |
|            | The session is terminated due to maintenance operation              |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmmm</b> | <i>Explanation</i>                                              |
|-------------|-----------------------------------------------------------------|
|             | The total number of receiving ports specified exceeds the max.  |
|             | There are no INS MXRs to run test on                            |
|             | Timeslot channel numbering not allowed with CAS                 |
|             | Timing Extractor type TLI (need SSP info)                       |
|             | Timing Extractor type TLIs are present                          |
|             | Transmic 1G NPC designated as SYNC source invalid               |
|             | Transmitting port cannot be dropped                             |
|             | Tried to disconnect a nonexisting VC                            |
|             | Trunk conditioning doesn't match that of conference             |
|             | Try to add a BBL to VC, but the VC already has backbone         |
|             | Try to delete a BBL leg from VC; however, VC has no BBL leg     |
|             | Try to delete a BRD leg from VC; however, VC has no BRD leg     |
|             | Trying to add a BBL leg to a conference set up as SYM           |
|             | Trying to add a BBL to a DMB conference that already has one    |
|             | Trying to add a SYM leg to conference set up as broadcast       |
|             | Trying to add a broadcast leg to a conference set up as SYM     |
|             | Trying to add or delete a leg when a conference is under test   |
|             | Trying to change in NTR direction                               |
|             | Trying to change level in on BBL leg                            |
|             | Trying to change level out on BRD leg                           |
|             | TS0 connected to nonTS0 in Mode 2 - "a" should be "-" or "b"    |
|             | Two digroups from same bank added to different FTMIIs           |
|             | UC is in service but failed                                     |
|             | Unable to verify Configuration file since MP DB not loaded      |
|             | Unassigned operational mode                                     |
|             | Unframed clear 2Mbit/s NPC invalid for Bit 4 used as RA IS/RBER |
|             | Unframed clear 2Mbit/s NPC invalid for TS0 processing           |
|             | Unit is not FTU type                                            |
|             | Unit type error                                                 |
|             | Unmapped channel(s) on old                                      |
|             | Unpestering error registers for subj. entity failed             |
|             | Use of this NPC is RESERVED for SLC 96 MD 1                     |
|             | User does not exist                                             |
|             | User has been created                                           |
|             | User has logged in somewhere                                    |
|             | User is not logged in                                           |
|             | User logged off during session                                  |
|             | User login-id is not DAX                                        |
|             | User macro/map space is full                                    |
|             | User quit the menu                                              |
|             | User still owns files                                           |
|             | Width of existing two way does not match conference width       |
|             | Write to CPR failed                                             |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b> | <i>Explanation</i>                                                   |
|------------|----------------------------------------------------------------------|
|            | Writing Feature Package Id to PMEM failed                            |
|            | Wrong SSP type(Timing Extractor type)                                |
|            | Wrong TLI type                                                       |
|            | Wrong TLI type (need CRO grow command)                               |
|            | X option is illegal                                                  |
|            | XMIT continuity test won't be run: CFT code specified                |
|            | XMIT continuity test won't be run: no XMIT timeslots available       |
|            | Y option is illegal                                                  |
|            | Z option is illegal                                                  |
|            | Channel is OCON in opposite direction                                |
|            | Circuit already terminated                                           |
|            | Circuit not terminated                                               |
|            | Hub id not set when MJU pack grown                                   |
|            | Invalid mode for TLA/TLR                                             |
|            | Invalid test access mode                                             |
| SOSF       | All CBTYP NPCs out of service or failed                              |
|            | DSPU unit controller is failed                                       |
| SPFA       | No protection is available for the Service MMFG                      |
|            | Protection switch process failed                                     |
| SPSW       | The Protection MMFG is selected, and auto. switchback is unavailable |
|            | The protection MMFG is serving another facility                      |
| SROF       | (NPC) Hardware mismatch                                              |
|            | BOOT on subject entity failed                                        |
|            | CCN denied request                                                   |
|            | Can't lock or unlock ram database                                    |
|            | Circuits TCONed itself cannot be UTST                                |
|            | DB can't get the slave mail box                                      |
|            | DB can't send or receive mail                                        |
|            | DGN on subject entity failed                                         |
|            | Failed to boot CI                                                    |
|            | Failed to boot CONF file                                             |
|            | Failed to boot DB                                                    |
|            | Failed to boot journal--recurrence indicates database corruption     |
|            | Failed to boot subject CCN side                                      |
|            | Failed to boot unit                                                  |
|            | Failed to switch SYNC side                                           |
|            | General boot failure (vanilla flavor)                                |
|            | IU/TI type NPC                                                       |
|            | MIU is failed                                                        |
|            | MXR is failed                                                        |
|            | Mismatch between MXR and MIU HDW types                               |
|            | NPC Failed or Out of Service                                         |

**Table A-1. mmmm Condition Codes (Continued)**

| <b>mmm</b>  | <i>Explanation</i>                                         |
|-------------|------------------------------------------------------------|
| <b>mmm</b>  | No Memory Backup Has Been Scheduled                        |
|             | None of the designated NPCTG(s) are equipped               |
|             | None of the designated TG(s) are equipped                  |
|             | PMEM verification failed                                   |
|             | Read/write eeprom error                                    |
|             | RST failed to boot DB                                      |
|             | RST failed to boot program                                 |
|             | SSC software out of date                                   |
|             | Sync not completely reset                                  |
|             | Sync pack denied command                                   |
|             | Syncs failed to cross couple                               |
|             | The MIU boot failed                                        |
|             | The MIU diagnostics failed                                 |
|             | The MXR boot failed                                        |
|             | The MXR diagnostics failed                                 |
|             | Unit 1 denied request                                      |
|             | Unit 2 denied request                                      |
|             | Unit 3 denied request                                      |
|             | Unit 4 denied request                                      |
|             | Unit 5 denied request                                      |
|             | Unit 6 denied request                                      |
|             | Wrong MXR type grown for this MIU                          |
| <b>SRTN</b> | Test Port release failed                                   |
|             | Test group release failed                                  |
| <b>SWFA</b> | Active CCN side not IS or failed or pested or hardware OOS |
|             | Boot TLI failed                                            |
|             | Checksums verification failed                              |
|             | DB PMEM error OP-CL-RD-WR-SK                               |
|             | DB SMEM error OP-CL-RD-WR-SK                               |
|             | DSPI failed                                                |
|             | Data link failed                                           |
|             | Device failed to format                                    |
|             | Device failed to initialize                                |
|             | Failed to lock sync to timing reference                    |
|             | Far end failed to respond                                  |
|             | Hardware database mismatch                                 |
|             | MXR LOS with unselected FLI                                |
|             | Selected FLI has LOC with at least one inservice MXR       |
|             | Sync is not configured yet                                 |
|             | Unselected FLI has LOS with at least one inservice MXR     |



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