DEFINITY™

Communications System
Generic 2

Maintenance Procedures

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Class A Statement. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

Network Registration Number. This equipment is registered with the FCC under FCC network registration number AS593M-11185-MFE.

Answer-Supervision Signaling. Allowing this equipment to be operated in such a manner as to not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user.

This equipment returns answer-supervision on all DID calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered
- A busy tone is received
- A reorder tone is received

Trademarks

DEFINITY is a registered trademark of AT&T. In this document, DEFINITY Communications System Generic 2 is often abbreviated to DEFINITY Generic 2 or Generic 2.

Comments

To comment on this document, return the comment card at the front of the document.

CONTENTS

ABOUT THIS DOCUMENT

This service document describes maintenance procedures you use to test and repair the DEFINITY® Communications System Generic 2 (called DEFINITY Generic 2 in this document).

INTENDED AUDIENCE

This document is for personnel who maintain the DEFINITY Generic 2 and the peripherals connected to it. This document may also be used by those under the control and direction of a remote maintenance facility such as the initialization and administration system (INADS).

AT&T technicians, at all tier levels, and switch premise technicians can use this document to learn the maintenance procedures and as a reference tool.

PREREQUISITE SKILLS, KNOWLEDGE, AND EQUIPMENT

To understand and use this document you should have both technical and problem-solving skills and be familiar with common terminology and concepts of voice communication data communications, computers, and electronic hardware.

You may also need some knowledge about the DEFINITY Generic 2 hardware and maintenance strategy. It maybe helpful to review chapter 2 and appendix A of *DEFINITY® Communications System Generic 2 Maintenance Repair Strategies* (555-104-118).

To use this document you willneed a DEFINITY Communications System Manager® II (called Manager II in this document), directly or remotely connected to a switch.

If the switch is not responsive, go to chapter 5 in (rgDEFINITY Communications system Generic 2, Maintenance Repair Strategies (555-104-118). If Manager II is not responsive, go to *DEFINITY® Manager II MS-DOS Version Operation* (555-104-505 Issue 1).

HOW TO USE THIS DOCUMENT

Start all your switch maintenance with Procedure 600 Test 1 and then go to the referenced procedure to isolate and repair a problem.

For most procedures you should start with test 1 and progress through all the tests. Test 1 usually shows failure information specific to a procedure.

HOW THIS DOCUMENT IS ORGANIZED

This document is divided into the following chapters:

- About This Document
- Introduction
- Getting Started with DEFINITY Manager II
- Common-Control Procedures
- Network Procedures
- Common-Control Peripheral Procedures
- Connection Status Procedures
- Other Procedures

There is also a glossary and an index.

Procedures appear numerically in this document. The procedure and test number appear at the top of each page.

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RELATED RESOURCES

The on-line information contained in the switch support base (SSB) is a subset of this document.

This document directs you to *DEFINITY® Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) for detailed repair steps.

This document contains information from *DEFINITY® Manager II MS-DOS® Version Operation* (555-104-505).

CONVENTIONS USED IN THIS DOCUMENT

The following are examples and explanations of the conventions that are used in this document.

p600 t2	Commands that you enter on your PC's keyboard appear in constant width bold.
	Example: Enter p600 t2 to start test 2.
(Home)	Keys on your PC's keyboard are represented as a boxed key label.
	Example: Press [HOME] to move the to the top of your screen.
(CTRL-c)	Where two keys are to be pressed simultaneously, their hyphenated labels are shown inside the same box.
	Example: To stop any program in progress, press [CTRL-c].
[F5 HELP]	Shows the labels on the bottom line of the PC screen while you are using Manager II. Screen labels are shown in this document as a boxed label with square comers.
	Example: Press [F5 HELP] to get help with the procedure on your screen.
To Resolve Alarms	References to other sections of this document or other documents are shown in italics.
	Example: If you want to resolve alarms, go to *To Resolve Alarms.*
MAJOR	Indicators or data that appears on your screen are shown with constant width type.
	Example: After you resolve all alarms, MAJOR disappears from your screen.

MAJOR	Hardware switches or indicators are shown in bold.
	Example: The switch turns off **MAJOR** on the common-control alarm panel if there is no other reason for it to be on.
Enter	Means to type the information and then press the [Enter], [Return], or other similar key.
	Example: Enter p600 (and press [Enter]) to start procedure 600.

HOW TO MAKE COMMENTS ABOUT THIS DOCUMENT

Reader comment cards are in this chapter of this document. While we have tried to make this document fit your needs, we are interested in your suggestions for improving it and urge you to fill out one.

If the reader comment cards have been removed from this document, please send your comments to

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INTRODUCTION

This chapter describes the format and content of a maintenance procedure, highlights some common practices that apply to all procedures, and describes each group of maintenance procedures.

PROCEDURE FORMAT AND CONTENT

Each maintenance procedure may have the following sections.

Purpose	Explains what the procedure does in one or two sentences. You can quickly assess whether this is the procedure you need.
Tests	Summarizes each test so you can quickly go to the test that you need.
Procedure Overview	Includes notes for using the procedure, explanations about why the procedure is important, and what the procedure tests in the switch.
Flowcharts	Directs you from test to test to do the task summarized in the purpose section.
Test Operation	Describes how to use each test in a procedure and subdivides each test into tasks. A table of contents directs you to each task.
Special Error Codes	Lists any special error codes and tells what to do if the special error code appears.
Procedure Fields	Lists each input field and explains each field that may appear on your screen.

GENERAL RULES AND PRACTICES

This section provides some guidelines for using maintenance procedures and describes practices that are common to all procedures.

Maintenance Log

Keep a written log that describes all maintenance history for each switch. Other maintenance personnel can then refer to the log to get switch failure history information. Record all alarms before you clear them.

If you leave the switch site and you have intentionally left circuits busied out, make an entry in the log explaining why you left the circuits busied out.

Alarm Failure History Logs

The switch stores all switch maintenance history in the periodic maintenance data structure (PMIDS) error log.

PMIDS contains the following information about each error or alarm:

- Equipment location

- Unit type

- Alarm status (active or resolved)

- Number of errors recorded

- When the error first appeared in the switch, when the error became an alarm, when the alarm or error was last detected, and when the error or alarm was resolved

- A pointer to another maintenance procedure you can use to isolate the failure that caused the alarm

Throughout this manual, and usually in test 1 of a procedure, you can view alarms that are specific for a procedure. When you view alarms in a procedure (for example, Procedure 620), you are looking at all network alarms that are copied from PMIDS into the network failure history log. When you resolve an alarm, it is marked resolved in the PMIDS error log. It may still appear in the procedure you are in but it is now marked resolved.

Test Screens

The screens may be different for each test in the procedure. Each field is specifically defined for the test you are in. The fields that appear on the procedure screen and even the names of the fields maybe different for each test.

Highlighted Fields

If a field is highlighted on your screen, you can enter data into the field. To enter data in a field that is not highlighted enter cf and the number of the field you want to change. If any equipment location field is blank, all equipment locations fields after it are also blank.

Invalid Alarms

Inmost procedures, you can enter cdx to clear invalid alarms. An invalid alarm is an alarm that you have created while doing a maintenance task. Do not resolve any valid alarms. If you are not sure whether an alarm is valid or not, investigate the alarm and repair the failure.

Transferring Equipment Locations

If you are in test 1 (of most procedures), you can transfer the equipment location on the screen to the rest of the tests in the procedure.

If you are in a procedure (for example, Procedure 600) and you want to transfer the equipment location on your screen to another procedure, you can not transfer the equipment location to test 1 (or the test that shows you the failure history log). You must go to the other tests in the procedure to have the equipment location (for example, from Procedure 600) appear.

Off-Line Procedures

The following procedures can be done both on-line and off-line in a duplicated common-control switch.

- Procedure 600 - Examine alarm and error log
- Procedure 610 - Disk tape system tests
- Procedure 611 - Common-control tests
- Procedure 612 - Initialization causes
- Procedure 614 - Main and cache memory tests
- Procedure 616 - Alarm indicator tests
- Procedure 618 Tests 1-3- Diagnostic processor and remote interface tests
- Procedure 650 - Data Communications Interface Unit (DCIU) tests
- Procedure 652 - Hardware and software clock tests

MAINTENANCE PROCEDURE DESCRIPTION

This section describes the types of maintenance procedures contained in this document.

General Switch Procedures

General switch procedures give status information about the entire switch or about switch components that can affect the entire switch. General switch maintenance procedures include Procedure 600 and Procedure 601.

Common-Control Procedures

Common-control procedures test the common control and associated components. Common-control procedures include Procedures 610-614, 616, and 618.

Network Area Procedures

Network procedures deal with the digital network and its peripherals. Included are testing and recording capabilities for much of the hardware. Network procedures include Procedures 620-625, 627, 631, 635 640, 642-644, and 646-648. Procedures 631, 635, 640, and 642-644 are auxiliary procedures (they do not do any tests) used to monitor switch information.

Common-Control Peripheral Procedures

Common-control peripheral procedures test any equipment that can directly communicate with the common control through a nonnetwork path. Common-control peripheral procedures include Procedures 650-656.

Connection Status Procedures

This group of maintenance procedures shows the connection status and lets you trace a call through the switch. Connection status procedures include Procedures 960-962.

Other Procedures

Procedure 999, included to help fix memory problems, shows the data contents of a memory address through the software tables.

GETTING STARTED WITH DEFINITY MANAGER II

This chapter is adapted from *DEFINITY® Manager II MS-DOS® Version Operation* (555-104-505, Issue I).

Manager II is the name of software that you can use to administer and maintain DEFINITY Generic 2, System 85, and selected Dimension systems from an AT&T-certified personal computer loaded with the MS-DOS operating system (version 3.2 or higher). This chapter introduces the capabilities of the Manager II software and its functional characteristics.

When an AT&T communications system is installed, AT&T provides software that determines how that system is to function. his software enables the features requested on your original customer order (for instance, class of service, dialing plan, and system features). The software is stored on a tape or disk that can be read into the system when initialization is required (such as in the event of power failure).

As communications needs change, communications systems must be changed to meet those needs. For example, when a person in your organization changes rooms, your communications system must be changed to reflect this relocation. Numbered procedures enable you to access configuration data in the system or to change the configuration of the system. In common with other system management devices, the Manager II software makes these numbered procedures available to you. And, because maintenance procedures are accessed in the same way, a qualified technician can use Manager II to perform system maintenance operations.

ENHANCED-MODE OPERATION

This section describes the principles of Manager II operation in the enhanced mode. Enhanced-mode operation accesses the numbered procedures in your system's software. The enhanced mode of the Manager II software makes use of a database: the switch support base (SSB) that describes your DEFINITY Generic 2.

Break

Manager II has a *break* function that is similar to that of MS-DOS. That is, to stop an activity at any time, press either [CTRL-c] or [CTRL-BREAK]. If a run file is active, control is returned to the environment from which it was executed: either the MS-DOS operating system or the Manager II software's command line. If a connection sequence is in progress, it is halted and control is returned to the Manager II command line. Otherwise, the Manager II software is halted and control is returned to the MS-DOS operating system.

Cursor

The cursor is the visual indicator that appears as a blinking underline on Manager II displays. As you progress through your work, the cursor moves from one screen position to another to indicate where a character can be entered or deleted.

Enhanced-Mode Access

If your PC has the SSB database described above, enhanced mode is active immediately after you log in to Manager II. In this case enhanced mode is the default mode of operation. To access enhanced mode from another Manager II mode, simply enter enh at the command line. If an SSB is available, Manager II switches to enhanced mode operation.

Working Without a Connection

Before you connect to a switch, several functions of the Manager II software are available to you. For example, you can access the command help facility described below. You can also open a log file, or use the *hist* command to check the last few actions taken by Manager II. You can also modify your user database with the *udb* command.

Connection

After you log into Manager II, you may connect to any of the switches supported by your user database. If your PC has two communication ports, you can connect to two switches simultaneously. To connect, in the sense used here, use the Manager II software to activate a PC communication port (and perhaps, to dial the number of a switch) and to log into a switch.

In general, you can connect in either of two ways. If you use the *con* command without argument, you are presented with a menu that makes it possible to select switch and connection parameters interactively. If you use the *con* command with the switch name as an argument, the connection process begins immediately. Both possible ways of using the *con* command are explained in detail starting on page 2-8.

Regardless of how a connection is initiated, messages are displayed that report on the state of the connection attempt as it proceeds. When the attempt to connect fails, the software returns to its previous state. The last of the messages mentioned above gives you the reason for the failure. If you would like to review the last nine messages, enter hist, the history command. A display appears showing the last nine command lines, status and error messages, and procedure data. Press the function key labeled [F1 EXIT] to leave the display. When the attempt to connect succeeds, the software displays the active switch modes if the system is a Generic 2 and returns the cursor to the command line to await your command.

DATA ENTRY

Once you have connected to a switch, you may access switch procedures to enter data into the switch. The switch procedures are numbered with three-digit numbers. The object of a switch procedure is to send data to the switch. These data consist of numbers, each of which has an effect on the switch's programming. In enhanced mode, Manager II arranges these numbers as *fields* (on an orderly display) for you to fill in.

Data Entry at the Command Line

Enter p followed by a procedure number to access that procedure. (Enter p 600, for example, to access procedure number 600.) If you are familiar with the procedures you can enter data directly on the same command line. For example,

```
p 600   t 2 3 x   cf 2 4  ; l X
```

means the following. Summon Procedure 600 Test 2. Enter the number 3 in the first field, then execute test 2 and get any information known about that number (x). Change the contents of field two to 4; skip a field (the semicolon); and change the next field (field three) to 1. Finally, execute the test (x). It is possible to eliminate some of the spaces in the command. One of the many equivalent ways the command line could have been entered is:

```
p600t2 3x cf2 4 ; lx
```

Command Help

The syntax of Manager II commands is covered in detail beginning on page 2-5. Furthermore, an on-line help system is available for your use at any time while using Manager II in enhanced mode. You can view either brief reminders of the meaning of the commands or complete descriptions of the commands and their use. Either press the function key labeled [F8 CMDS] or enter hc or ? at the command line to view a display of commands and their meanings. To access the complete descriptions either press the function key labeled [F5 HELP] or enter h or help at the command line. The use of this help facility is described in detail on page 2-12.

Data Entry into the Fields

If you would rather enter data directly in the fields, proceed as follows. Access a procedure and wait for its display to appear. The display usually appears on your screen with the first field highlighted. The highlighted field is ready to accept data and is said to be *active.* The cursor is currently on the command line. Press the function key labeled [F3 DATA] to move the cursor to the highlighted field

Enter data into the field by typing new data while the cursor is in the field. Edit the field with the following keys.

● The [BACKSPACE] key removes a character as the cursor moves backward over it.

● The function key labeled [F4 CLEAR] blanks the entire field.

Having filled in a field to your satisfaction, use the following keys to move to other fields.

●Any of the [ENTER], [TAB], (→)and (↓) keys enters the data in the active field and moves the cursor to the next field. (This action leaves data in the new field intact.)

●Any of the [SHIFT-TAB] (←)and (↑)keys enters the data in the active field and moves the cursor to the preceding field. (This action blanks data in the new field.)

To Exit the Fields

Recall that you press the function key labeled [F3 DATA] to move the cursor to the active field. That act of pressing [F3] caused its label to change to [F3 CMD LN]. Press this ke again to return the cursor to the command line. The label of the key changes as appropriate to offer access to the command line or the active field.

Field Help

While a field is active (that is while it is highlighted), an [F6 FIELD] label is displayed on the screen. Press [F6] to get help that pertains to the active field. This help may be in the form of a range of possible values, if appropriate. Or, if more information is called for, this help may take the form of a window with text that you can scroll by means of the arrow and page keys. Each text element consists of an abbreviation (an encode) and supporting text describing the meaning of this encode in the current field

In the latter case, a highlighted bar appears in the window. Use the arrow and page keys to scroll through potential entries until you find the correct one. To select the encode described in the window, place the highlighted bar on your choice of encodes, and press the function key labeled [F3 SELECT]. The Manager II software transfers the encode thus selected to the current field and exits the field-help facility. To exit the field-help facility without making a selection, press the function key labeled [w].

Figure 2-1 illustrates Procedure 600 test 2 with field help active for field 2. In this case the user may have moved the cursor to field 2 and pressed the function key labeled [F6 FIELD]. To find encode 3, the user may have pressed the function key labeled [F4 FIND] and then entered initialization. Now, if the user were to press the function key labeled [F3 SELECT]. Manager II would enter the encode into field 2. In addition, the encode meaning would display to the right of field 6. So the line surrounding field 2 would look like this:

```
3. Unit Type: Initialization  Cause
```

and the cursor would move onto field 3.

This example illustrates another facet of Manager II's enhanced mode field help. When you enter an encode in many procedure data fields, whether or not you have pressed [F6 FIELD] , the meaning of that encode is displayed to the right of the field. This allows you to verify as you are entering digits that you have chosen the right encode.

```
                       ENHANCED MODE - PROCEDURE: 600, TEST: 2
                         EXAMINE ALARMS AND ERRORS BY UNIT TYPE

          2. Unit Type:
                                                 TIME STAMP
       EQUIPMENT  LOCATION                    11.   Stamp Index:
          3.    Module:                       12.         Day:
          4.   Cabinet:                        13.        Hour:
          5.   Carrier:                        14.      Minute:
          6.     slot :
          7.   Circuit:                     15. Procedure Reference:

          8.      Alarm Status:
        1=Environment
        2=Disk Tape System (DTS)
        3=Initialization  causes
        4=Common control I/0
        5=Memory
        6=Module Control Channel (MCC)
        7=Time multiplexed switch or module processor (TMS or MP)
        8=Maintenance  Interface

       Connected to CC0 ON-LINE  ♥
       RANGE 1-99
       enter command:
```

Figure 2-1. Procedure 600, Test 1 with Field Help

COMMAND SYNTAX

A command line appears near the bottom of basic-mode and enhanced-mode Manager II screens. When it is appropriate to enter a command, the cursor appears immediately after an enter command: prompt. Here are the general rules of syntax.

- Always type a space between items of data. (Manager II interprets "123" as data for one field, while

- Enter a series of commands, parameters, and data by pressing [ENTER] (or whatever the equivalent of "CARRIAGE RETURN" is called on your keyboard).

- Some commands require that [ENTER] be pressed before another command can be executed. For example an [ENTER] must immediately follow the task command.

In general, commands and data are easier to read (for example, in log files) if they are separated by spaces (or tabs or newlines), so it is a good idea to to use such space as a rule. However, you will find that the Manager II software correctly interprets most commands whether they are entered like "p150w2" or "p 150 w 2".

Most basic-mode and enhanced-mode Manager II commands do not accept parameters at all. A few, however, require parameters. A parameter is a way to tell a command to change how it operates or to give the command enough information to perform its function. Parameters immediately follow the command itself. For example:

- The procedure command, `p`, requires a procedure number: `p 100`

- The equipment-location command, `el`, requires an equipment location: `el 1 0 c 2 23`

- The run-program command, run , must have the quoted name of the program file to be run. (It may also take another parameter.): `run "cmd-file"`

Parameters are optional for a few commands. For example:

- The get command may take an option that modifies its effects or a file designator that specifies the files on which it operates or both get `-a "file"` or get

- The **log** command may take the name (otherwise a default file name is used): log "log-file" or log

- The switch-mode command, may take the number of the mode to be accessed (see the description on for details): m `123` or `m`

COMMAND REFERENCE

The commands listed below are basic-mode or enhanced-mode commands. Some of them can be used in *run files,* that is, in command scripts executed by the Manager II software. All of them can be used on the Manager II command line. Of the commands listed below that apply to procedures, not all apply to every procedure. Some commands work only with administrative procedures (procedures numbered from 000 through 499). Some work only with maintenance procedures (procedures with numbers greater than 499). Some are needed only with particular administrative or maintenance procedures. If a procedure cannot execute a command that you have used, it will respond with an error message.

bas - Basic Mode

Use bas to change to Manager II's basic mode.

bo - Busy Out

Use bo to place circuit locations in maintenance busy-out status. Use this command either from a maintenance procedure that allows a circuit to be busied out (not all procedures allow this), or in one of the following busy-out procedures. (Not all procedures are available on all communications systems. Procedure 635 is available only on Generic 2 systems.):

> procedure 635 - Cause of maintenance busy out
> procedure 631 - Trunk group busy out
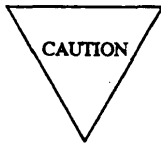
Equipment is removed from service when placed in busy-out status. Consider this effect before using the bo command.

cdx— Clear Data Execute

Use cdx to resolve alarms, that is, to clear the alarm-sent bits in the error log without clearing the record itself. Clearing the alarm-sent bit of an error record turns off the alarm indicator on the alarm panel and on the Manager II status line if there is no reason other than the state of the error log for the indicators to be on. Like certain other commands, cdx is effective only when used from within appropriate maintenance procedures (such as Procedure 600).

cc — Clear Entry

Use ce to clear the current input field. New data can now be entered in the cleared field, or, to leave the field blank, use the ; command to move to the next input field.

cf — Change Field

Use cf followed by a field number, to make the specified field go blank. The specified field lights up to indicate that it is ready for input. For example, c f 4 changes the current input field to field 4 (provided, of course, that field 4 exists and accepts data).

con —- Switch Connect

This command establishes a connection with a named switch. To use the command, type con (for connect then a space and a switch name and press [ENTER]. (A switch name is the name of a particular switch, a name determined by you and included by AT&T in your Manager II user database.) The con command refers to the database for the default connection conditions associated with the named switch.

Users can override the following defaults: the connection type, the data (baud) rate, the port number, the wait timeout, and the number of attempts to connect. To do so, use the con command followed by any of the options given below.

```
switch_name               -bBit_rate                -cConnect_type

-pPC_Port_No.             -wWait_timeout            - nNo ._of_retries
```

If you use the switch name, it must be the last option on the command line. The parameters introduced in the paragraph above are explained in table 2-1.

TABLE 2-1. Connection parameters

Name	Parameter	Comment
Connection type	hw md mp m t	hard-wired modem, digital (DTDM, PDM) modem, pulse dialing modem, tone dialing
Baud rate	300 1200 2400 4800 9600 19.2	⎫ ⎪ ⎬ baud ⎪ ⎭ kilobaud
PC Port number	1 2	COM1 COM2
Wait timeout	10-99	seconds modem waits from the start of dialing until the return of carrier detect signal
Number of attempts	1-9	to connect

Enter **con** *without* specifying a switch name to access a menu system that will help make our connection. The switch name field on this menu is highlighted. Press the function key labeled [F6 FIELD] to make Manager II display a list of available switch names. On the resulting display, a highlighted bar emphasizes one of the switch names. To use this display, press any of the (↑), (↓), [PAGE UP], and [PAGE DOWN] keys to position the bar over the switch to which you want to connect. Then press either [ENTER] or the function key labeled [F3 SELECT].

At this point, the fields on the menu are filled by the default data associated with the switch just selected. You can change the contents of any of these fields by using the means you used to select the switch or by backspacing over the field and entering new contents.

As soon as a switch is selected,a [F2 CON] label appears on the screen. At the time you are ready to connect to a switch according to the conditions shown on the screen, simply press [F2]. You are informed when your connection to the switch is successful.

Having connected to one switch, you might want to alternate between it and another switch as you work. You can connect to up to two switches at one time. To do so, simply attempt another connection as described above. Messages are displayed that report on the status of the connection attempt as it proceeds. If the second switch connection is successful, this switch becomes the currently selected connection. While two connections are established, type con without arguments to toggle between the two.

If con is issued from the command line and a failure occurs, the software returns to the previous state of your connections. That is, if there was no connection, there remains no connection. If a connection exusted, the previously selected connection is reestablished as the currently selected connection.

If con is issued from a run file and a failure occurs, execution of the command file is always terminated. (This action prevents subsequent commands from affecting the wrong switch in the event of a previously established   connection.)

The connect command allows you to specify the baud rate for your connection. However, the choices are limited by the hardware used in the link. Remote maintenance, administration and traffic system (RMATS) ports for Generic 2 or System 85 communications systems work only at 1200 baud. RMATS ports for Dimension systems work only at 300 baud. PPG ports (for Generic 2 systems) offer more flexibility. They can operate at from 300 to 19200 baud. Of course, any modems that are part of the connection must also be able to work at the selected rate.

disc — Switch   Disconnect

Use disc to disconnect from the current switch. This command releases the current connection and makes the currently used port and modem available for another con command. If you are connected to two switches when you use the disc command, then the alternate switch will become the current connection.

dsp — Display

Use dsp to display data for the current procedure.

el — Equipment Location

Depending on the mix of features required of it, a given DEFINITY Communications System may contain network modules of either of two types: a *traditional* module or a *universal* module. Because of differing structures, the two types of modules call for different forms of equipment-location codes. Equipment-location codes for traditional modules are of the form used for Dimension and System 85 communications systems. Equipment-location codes for universal modules are of the form used for System 75 communications systems. Use el to translate an equipment location from universal to traditional forms or the reverse. The el command uses the syntax given below.

el *module cabinet carrier [slot [circuit]]*

Here, *module* and *cabinet* are numbers indicating their respective locations. The *carrier* argument is a letter from "a" through "e" if the equipment location is universal and a number if the equipment location is traditional. The number of the *slot* or of the *slot* and *circuit* can also be specified. The results of the command are displayed on the message line just above the command line. Of course, to get a complete equipment location, you must specify slot and circuit. For instance the command:

el l0e 15 20

causes Manager II to display the following message line:

Universal 1 0 E 15 20 corresponds to Traditional 1 3 1 0 4

The el command provides mapping only; there is no attempt to verify that a given equipment location exists on the current switch. Indeed, works whether or not a switch is connected to your PC. Although the el command is especially helpful when you are using basic mode to administer the DEFINITY Generic 2, it is also useful to verify mapping information when you are using enhanced mode.

enh — Enhanced Mode

Use enh to change Manager II to the enhanced mode. Enhanced mode is only available if the applicable switch support base has been installed on your PC.

; — Advance One Field

Use; to leave a field's contents as they are. That is, use ; to advance past the currently active field to the next-higher-numbered field without changing the contents of the field thus passed. If the current field is the last one (and therefore you cannot skip to a next field), use the change-field command (cf) to move to another field.

get —Get Support Files

Manager II requires many files of switch data to support the switch-specific features of its enhanced and task modes. All Generic 2 systems contain such files in their magnetic storage facilities. These same files are also available on diskettes.

Use the get command to install the support files from the currently selected switch provided the connection is through a PPG port. Files cannot be copied to the switch by way of an RMATS port. To do so, use a command line of the following type

```
get [ -a] [-g ] [-s ] [ "file_name_expression"] [ENTER]
```

Where:

-a   Means: get all of the switch support database files. The default is to get from the switch only those which which from those installed on the PC.

-g   Means: get the specified information immediately. The default is to display a screen through which you can interactively refine the list of files you wish to obtain.

-s   Means: do not synchronize copies of the switch database. This option is for use by qualified technicians only. It is always best to insure that the disk copy is up to date. Therefore, this option should be rarely if ever used.

file_name_expression are names of files you want to specify for installation or viewing. Wildcard file-name specifications may be used. The conventions that apply to these specificaitons follow.

> X   A character (for example, X) not listed below matches itself.
>
> X*   A character not listed below followed by an asterisk matches *zero or* more occurrences of the character.
>
> X+   A character not listed below followed by a plus sign matches *one* or more occurrences of the character.
>
> *   An asterisk at the beginning of an expression matches any string — including *.* and the null string.
>
> .   A period matches any single character.
>
> [...]   Characters within brackets match any one of the enclosed characters. A pair of characters separated by - matches any character that falls between the pair (in ASCII order), including the pair itself. If the first character that follows the opening bracket is a circumflex ("), any character *not* enclosed is matched. (Therefore, for example, [^abc3 -7] matches any character except a, b, c, or numbers 3 through 7.)
>
> ^   A circumflex (outside of brackets) matches the beginning of a line.
>
> $ A doIlar sign matches the end of a line.
>
> A specification that begins with a circumflex and ends with a dollar-sign, therefore, matches an entire filename when used from the get command line. When used interactively from a get menu, such a specification is matched only by an entire line from the display. That is, the contents of that line must match the specification between the ^ symbol and the $ symbol.

Unless you use the -g option, a screen resembling figure appears.

Unless the -a option was used, only files that differ between your communication system and your PC will be listed on the screen, and they will all be marked for downloading (with a yes in the first column). To mark a file so it will not be downloaded, use the [PAGEDOWN] and@ keys to highlight the line on which the file appears and press the function key labeled [F3 SELECT] to toggle the first field to no. If the menu is extensive, use the function key labeled [F4 FIND] to search for a filename. To use this facility, just press [F4] and then enter an expression of the type described above (do not quote the expression in this context). The Manager II software attempts to match your expression with a menu item. If a match is found, the highlight bar is moved to the matched item. Otherwise, the highlight bar is moved to the first item in the menu. To download the files marked yes, press the function key labeled [F2 GET]. To return to the enter command: prompt, press the function key labeled [F1 EXIT]. If the file you wanted to download is not listed, press the function key labeled [F6 ALL].

Pressing [F6] in the context just described has the same effect as using the -a option with the get command. That is, all files are now available for you to look at, and all entries in the first column become no. Using the function keys as just described, select the files you want downloaded by marking them with yes in the first column. When all files are listed, the label for the F6 key changes to [F6 DELTA], and offers the option of selecting a list of files that differ between system and PC.

help — General Help

Access help by entering h or help at the command line, or by pressing a function key on your set that is screen-labeled [F5 HELP]. Use these commands to access a menu of subjects appropriate to the currently selected procedure (or a menu of general subjects, if no procedure is selected). However you choose to get help, the menu that appears will display a highlighted bar over one of its items. Use the ↑, ↓, [PAGE DOWN], [HOME], and [END] keys to position the bar over the subject on which you need information. Then press the [F3 SELECT] function key or press [ENTER] to select a subject. This may lead to a screen with information or to a subordinate menu. If a menu is on your screen, proceed as above. If information is on your screen, scroll through it as described above.

As you peruse the available help screens, several function-kc labels variously appear and disappear on the screen. These are [F3 SELECT], [F2 RETURN], [F1 EXIT], [F4 FIND], and [F6 FIELD]. The [F3 SELECT] function key has already been descibed. Use the [F2 RETURN] function key to return to the previous menu. Use the [F1 EXIT] function key to exit the help facility. Use the [F4 FIND] function key to search for a help topic within a menu.

This FIND function is most useful when you are confronting a long list of possible topics. For example, there are hundreds of administrative procedures, each one with a set of help screens. Having accessed the administrative-pedure help menu, suppose you want to find procedure 120. To do so, simply press [F4 FIND] and type 120 on the command line and then [ENTER]. Manager II searches the list of procedures and the highlighted bar is moved to the line containing the number 120.

You can type any string on the command line and have the FIND function look for a match. The function will even look for strings matched by the wildcard conventions used by the get command and described

above. Therefore, for example, you could type

```
restrict. *search
```

to find the following string.

```
Procedure 283 Word 1 - Facility Restriction Level Related Searches.
```

Having used the [F4 FIND] **function key to highlight the topic line, press the function key labeled** [F3 SELECT] to view help on the highlighted topic.

The **Manager II** general-help facility lets you display information about the procedures on your system. You ma even display the procedures themselves from general help. This is accomplished by using the [F6 FIELD] function key in two different ways. First, the screen label appears when you ask for help on an administrative or maintenance procedure. Press the function key labeled [F6 FIELD] to bring to your PC's screen a duplicate of the procedure display. Thus, pressing [F6] once serves to display all the fields of the procedure. If you press [F6] again, help pertaining to the highlighted field is displayed.

The help displays just described are identical to the administration and maintenance displays. Be careful, therefore, not to confuse this general-help procedure display with an active procedure display. Data displayed or entered in the general-help display is local to general help and vanishes when you exit the help facility.

hc — Help: Command

View a screen describing the Manager II commands by entering **hc** or **?** at the command line, or by pressing a function key on your set that is screen-labeled [F8 CMDS]. This screen associates each basic-mode or enhanced-mode Manager II command with a descriptive phrase that identifies its funciton. When you are ready to leave this screen, press [F1 EXIT] or [ENTER].

hf — Help: Field

Access descriptions of the individual fields b entering hf at the command line, or by pressing a function key on your set that is screen-labeled [F6 FIELD].

While a procedure field on your screen is ready to accept input (that is, while the field is active), the appears **on your screen.** If you press this function key or if you enter hf at the command line, you will receive a description of the active field. This description maybe in the form of a range of possible values, if appropriate. Or, if more information is called for, this description may* the form of a window with text that you can scroll by means of the arrow and page keys.

In the latter case, a highlighted bar appears in the window. To select one of the encodes described in the window, place the highlighted bar on your choice and press the function key labeled [F3 SELECT]. To exit the field-help facility without making a selection, press the function key labeled [F1 EXIT].

hi —Help: Input Data Required to Execute Commands

In many switch administration or maintenance procedures, certain data must have been entered before the procedure can execute any given command. To display switch data associated with a given phone, for example, the phone must be identified by, say, extension number or equipment location. In this case, an identifying number must have been entered before dx can be executed.

To display a chart of commands associated with the data required for their execution, either enter hi from the command line or press the [F7 INPUT] function key. Such a chart may be much longer than the area available for its display. If so, use the (↑), (↓), [PAGE UP], and [PAGE DOWN] keys to scroll through it to find the information you need.

hist— Display History

Use hist to display the last nine events that have taken place. Such events may include commands, error messages, or switch data entries. If logging is active, the information thus displayed is identical to the last nine entries in the log file. Remove the history display by pressing [ENTER] or the function key labeled [F1 EXIT]

log— Open/Close Output Log File

Use the log command to open or close a file that logs Manager II activity. If you simply enter log, a default file is opened, namely MGRILLOG . (The actual name of the default file is specified in MGRILINL Manager II's initiation file.) If, however, you want to specify a file name for the activity file, do so as an argument (between double quotes) to the command. Thus, the command log **"new . log"** opens a log file named NEW.LOG.

Your commands and Manager II output are written to this file while it is open. The file is created in your current directory unless you specify a different directory with a full path name. The output file is closed by simply entering log a second time. Once you have created a log file, use commands provided by the MS-DOS operating system to print or view the file at your leisure.

m— Mode Procedure

Use m to specify the communications system mode for which you are in contention. Mode specification is only for Generic 2 and System 85s release R2V3 or later. The three modes that can be requested are the administration mode (l), maintenance mode (2), and tape mode (3). Enter m and then any digit between *1* and 3 to toggle the corresponding mode between off and on (0 and 1) Enter m alone (without any arguments), to display the current modes. A screen resembling Figure 2-2 appears. If the displayed mode has a value of 1 it is active; if it has a value of 0, it is inactive.

```
                      ENHANCED MODE  PROCEDURE MODE
                   SYSTEM  MANAGEMENT  ACCESS  PORT  STATUS

    CURRENT  PORT                        MODE  CONTROLLER
       1.    Administration:   Not Active    11.    Administration:   Not Active
       2.        Maintenance:  Not Active    12.     Maintenance: Not Active  Not Active
       3. Disk/Tape System:    Not Active    13. Disk Tape System: Not Active  Not Active
                                             14.        RAMP: Not Active   Not Active
    AGENTS                                   15.        SMAP: Not Active   Not Active
       4.   TN492 Port 0:
       5.   TN492 Port 1:
       6.   TN563 Port 0:
       7.   TN563 Port 1:
       8. Pseudo Port 0:
       9. Pseudo Port 1:




    Connected to CCO ON-LINE     ♥
    enter command:
```

Figure2-2. ModeScreen

The use of system modes allows several administrators to access one system at the same time. For example, one administrator could be executing administrative procedures on Manager II with the administration mode set. Another administrator could be executing maintenance procedures on the same system with the maintenance mode set.

You must have set the switch to *administration* mode to be able to change switch translations. You must have set the switch to *maintenance* mode to access maintenance procedures. You must have set the switch to *tape* mode to copy to or from your switch's tape cartridge (or to disk, if your switch is so equipped).

nc — Next Circuit

Where appropriate, use nc to make maintenance procedures select and display a new circuit location. Two uses of nc are possible: to display stored circuit information and to select a circuit location for testing.

To display test results or failure history one circuit location at a time, enter nc once for each new circuit location.

To select a single circuit location for testing, enter nc to step through and display circuit locations one at a time until the circuit you wish to test appears.

nd — Next Data

Use nd to advance automatically to the next data item. In those procedures that have an nd function, use it to display recorded data for a field that contains multiple data entries. Use nd also to step manually through all entries associated with the display field

For maintenance procedures, enter nd to display (for example) demand test results, periodic failure history data, and call processing failure history data (These records are arranged by circuit location, one location per record.) Repeatedly enter nd to display data records one part at a time.

nf— Next Fault

Use nf to step through maintenance error records that have various fault codes, one fault code at a time.

nt — Next Test

Use nt to advance the maintenance procedure to the next test that can be run. If the current test displayed is the last test that the procedure can run, the test selected cycles to test number one. The new test selected will not start until you enter x (for *execute).*

nu — Next Unit

Use nu to select and display the next unit type for testing when a maintenance test is selected. You can select and display the first circuit of that unit type for testing by entering nc (for *next circuit).* When displaying failure history or test results, enter nu (for *next unit)* to look at the first circuit location recorded for the next unit type (numerically) in the failure history list.

p— Procedure

Use p followed by a procedure number to access that procedure. For multiword procedures, Word 1 is automatically accessed first. For a maintenance procedure, the default test (test number 1) is automatically selected. Leading zeros are not significant when specifying procedure numbers. For instance, p12 is equivalent to p012, and po produces the same effect as p000.

quit — Exit Manager II

Use the quit command to exit from the Manager II software in an orderly way. In response, Manager II will disconnect any active connections and return control to the MS-DOS operating system.

rb — Release from Busy

Use `rb` to release a circuit from maintenance busy-out status. Whenever the `BUSY OUT` indicator is on, `rb` can be used within an appropriate procedure to release a circuit location from maintenance-busy status. (The indicator does not disappear until all busied-out circuits have been released.)

Use Procedure 635 — the *Cause of Maintenance Busy Out* procedure — to search for circuits that are in busy-out status. Or you may use this command from any maintenance procedure that allows a circuit to be released from maintenance-busy. See the busy-out command, `bo` for further information.

rs — Reset

The `rs` command reinitializes and reenters the procedure as if the *procedure* command, `p` had been used. All displayed fields are empty. For multiword procedures, *reset* reinitializes the currently displayed word. For a maintenance procedure, the nominal start configuration is displayed. Most often, this is test one, displayed with blank fields. (Some maintenance procedures require a second reset before all fields are cleared.)

s — Stop

Use `s` to halt test execution when a maintenance procedure test is running. Not all maintenance tests recognize this command. To stop such tests, request another procedure using the `p` command.

sw — Switch (Change) Common Controllers

The sw command switches the remote end of the currently selected connection to communicate with the other common control (CC) in a duplicated CC machine. This command works only if your PC is connected to the RMATS port (labeled TN492) of your system. For example, suppose communication is currently with CC0 through an RMATS port. Issuing the sw command switches communication to common control 1 (CC1). This change is reflected on the status line (fourth from the bottom) of the screen.

t —Test

The test command, is used to change from one procedure test to another. Use t followed by the number of the desired test. For example, to request test number two, enter:

`t2`

Most procedures have either words or tests. Procedures with words are generally used for administration while procedures with tests are designed for maintenance tests. The word command, w is used to change from one procedure word to another. Requesting a test from a procedure with words is of little use, as is requesting a word from a procedure with tests. Some procedures need only one screen, and therefore have neither words nor tests. A command closely related to the test command is the next-test command, nt (described elsewhere in this chapter).

x— Execute

Use x to initiate **some activity**. The activity will depend on the current procedure. In many cases execute, *x,* is used in conjunction with another command. For instance, administration procedures routinely accept the following command combinations:

- `ax:` add execute
- `cx:` change execute
- `dx:` display execute

Some of these procedures interpret `x` or `dx` to mean the same thing: display execute.

With respect to maintenance procedures, the execute command is usually used by itself. The `x` command typically tells the procedure to display fault information or to start a maintenance test.

Some maintenance procedures call for `x` to be entered twice. (Because of the importance of the test or activity, the procedure requires the execution command to be confirmed.) When performing such a procedure, press [ENTER] after the first execution of `x.` Then enter the second x command on the next command line.

FUNCTION KEY COMMAND REFERENCE

Access the commands listed below by pressing function keys when their labels are present on the Manager II screen.

[F1 EXIT] — Exit Current Menu

Use the function key labeled [F1 EXIT] to exit the current menu and return to the command line.

[F2 CON] — Connect

Having filled in the fields on the communications system connection menu, use the function key labeled [F2 CON] to connect to that system.

[F2 GET] — Get SSB Files

This label appears only on the get command screen. Use the function key labeled [F2 GET] to initiate the process of getting SSB files from the system.

[F2 MORE] — Display More Information

Use the function key labeled [F2 MORE] to bring the next display to your screen.

[F2 RETURN] — Display Previous Information

Use the function key labeled [F2 RETURN] to return the previous display to your screen.

[F3CHANGE] — Change User Database

Use the function key labeled [F3 CHANGE} to make a change in the user database.

[F3 CMD LN] — Move Cursor to Command Line

Use the function key labeled [F3 CMD LN] to move the cursor from the active data field to the command line so you can execute a command.

[F3 DATA] — Move Cursor to Data Field

Use the function key labeled [F3 DATA] to move the cursor from the command line to the active data field so that you can enter data directly into the field.

[F3 SELECT] — Select a Menu Item

Use the function key labeled [F3 SELECT] to select the menu item that is currently highlighted.

[F4 CLEAR] — Clear Field

While you are editing fields in a menu or procedure, use the function key labeled [F4 CLEAR] to clear the active field.

[F4 FIND] — Search a Menu

Use the function key labeled [F4 FIND] to search an extensive menu. To use this facility, press [F4] and then enter an expression. The Manager II software attempts to match that expression with a menu item. If a match is found the highlight bar is moved to the matched item. Otherwise, the highlight bar is moved to the first item in the menu. (See the description of the *help* command on page 2-12 for further details).

[F5 ERRORS]— Interpret Error Codes

Use the function key labeled [F5 ERRORS] to get an interpretation of error code numbers that can arise while using a procedure.

[F5 HELP] — Find Genera l Help

Use the function key labeled [F5 HELP] to access a system of "help" menus that describe the details of Manager II operation. (Use these menus as described for the *help* command on page 2-12).

[F6 ALL] — Display All SSB Files

This label appears on get command screens. Use the function key labeled [F6 ALL] to make Manager II rebuild the screen. The new display includes all possible SSB files.

[F6 DELTA] — Display Different SSB Files

This label appears on get command screens. Use the function key labeled [F6 DELTA] to make Manager II rebuild the screen. The new display includes only those SSB files on the current switch that are different from your SSB.   .

[F6 FIELD] — Describe Field

While you are editing fields in a menu or procedure, use the function key labeled [F6 FIELD] to access a description of data that maybe entered in the active field. This description maybe in the form of a range of possible values, if appropriate. Or, if more information is called for, this description may take the form of a window with text that you can scroll by means of the arrow and page keys.

In the latter case, a highlighted bar appears in the window. To select one of the encodes described in the window, place the highlighted bar on your choice and press the function key labeled [F3 SELECT]. To exit the field-help facility without making a selection, press the function key labeled [F1 EXIT].

[F7 INPUT] — Display Required Input Data

Procedures require a certain minimum of data before a change can be executed. Use the function key labeled [F7 INPUT] to find out what is required by the procedure you are using. This information may need more room than the area available for its display. If so, use the ⬆, ⬇, [PAGE UP], and [PAGE DOWN] keys to scroll through it to find the information you need.

[F8 CMDS] — Display Command-Line Commands

Use the function key labeled [F8 CMDS] to access a display of commonly used Manager II commands. If you are using the Manager II enhanced mode, and if you require further information about these commands, press the function key labeled [F1 EXIT] to leave the CMDS display. Then press the function key labeled [F5 HELP] to view the more detailed help displays.

3. GENERAL SWITCH PROCEDURES

This chapter contains the general switch maintenance procedures. General switch procedures give status information about the entire switch or about switch components that can affect the entire switch. General switch maintenance procedures include Procedures 600 and 601.

The following list summarizes the purpose of each general switch maintenance procedure.

PROCEDURE 600 - EXAMINE ALARM AND ERROR LOG

Use Procedure 600 to examine alarms and errors in the periodic maintenance information data structure (PMIDS) error log, to resolve alarms, and to delete alarms.

PROCEDURE 601 - ENVIRONMENTAL TESTS

Use Procedure 601 to examine the environmental failure history log, to resolve environmental alarms, and to test cabinets for environmental failures.

PROCEDURE 600 - EXAMINE ALARM AND ERROR LOG

Purpose

Use procedure 600 to examine alarms and errors in the periodic maintenance information data structure (PMIDS) error log, to resolve alarms, and to delete alarms.

Tests

Procedure 600 has three tests.

- Use test 1 to examine alarms by priority and to resolve alarms.
- Use test 2 to examine alarms by unit type, to search for errors, and to delete alarms.
- Use test 3 to examine resoleved alarms and to delete alarms.

Procedure Overview

Use Procedure 600 to investigate alarms or errors recorded by the switch. Start all your switch troubleshooting with Procedure 600. The switch stores all switch maintenance history in the PMIDS error log.

PMIDS contains the following information about each error or alarm:

- Equipment location
- Unit type
- Alarm status (active or resolved)
- Number of errors recorded
- When the error first appeared in the switch, when the error became an alarm, when the alarm or error was last detected, and when the error or alarm was resolved
- A pointer to another maintenance procedure you can use to isolate the failure that caused the alarm

If an automatic maintenance test fails, an error appears in the PMIDS error log. If you do not fix the error within a set time the error becomes a major, minor, or warning alarm. MAJOR and MINOR appear on your screen. The switch lights **MAJOR, MINOR,** or **WARNING** on the common-control alarm panel.

In a duplicated processor system each connected processor has its own PMIDS error log. The switch records any off-line processor errors. It is a good practice to examine the PMIDS error log for the on-line and off-line processors.

There are two ways to remove active alarms from the PMIDS error log in Procedure 600. Normally you will use test 1 and 2 to examine the PMIDS error log, go to the maintenance procedure that the test directs you to, and repair the problem that raised the alarm. The switch marks the alarm resolved after it passes a demand test. Most switch maintenance tests use this first method.

The second way is to delete any invalid alarms from the PMIDS error log. An invalid alarm maybe one that you caused while doing a maintenance task. If you must delete alarms, you can delete active alarms or errors with test 2 or delete resolved alarms with test 3. When you delete alarms they are removed from the PMIDS error log.
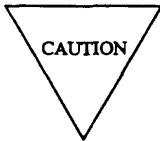
CAUTION   Deleting alarms is not a good practice and not a normal maintenance function.

An alarm, then, can be marked resolved when you repair the failure or when you resolve the alarm.

It is also a good practice to examine resolved alarms (with test 3) to find if there are problems that recur in the switch.

Use the following flowcharts to guide you from test to test. You may want to remove the flowcharts and refer to them as you use this procedure.

START

START TEST 1
TO EXAMINE
ALARMS BY PRIORITY

ENTER nc TO
SEE EACH ALARM

IS THERE AN ALARM?   YES →   GO TO
                                       PROCEDURE
                                       REFERENCED
                                       AND REPAIR

NO

IS THIS
THE LAST
ALARM?   NO

YES

END
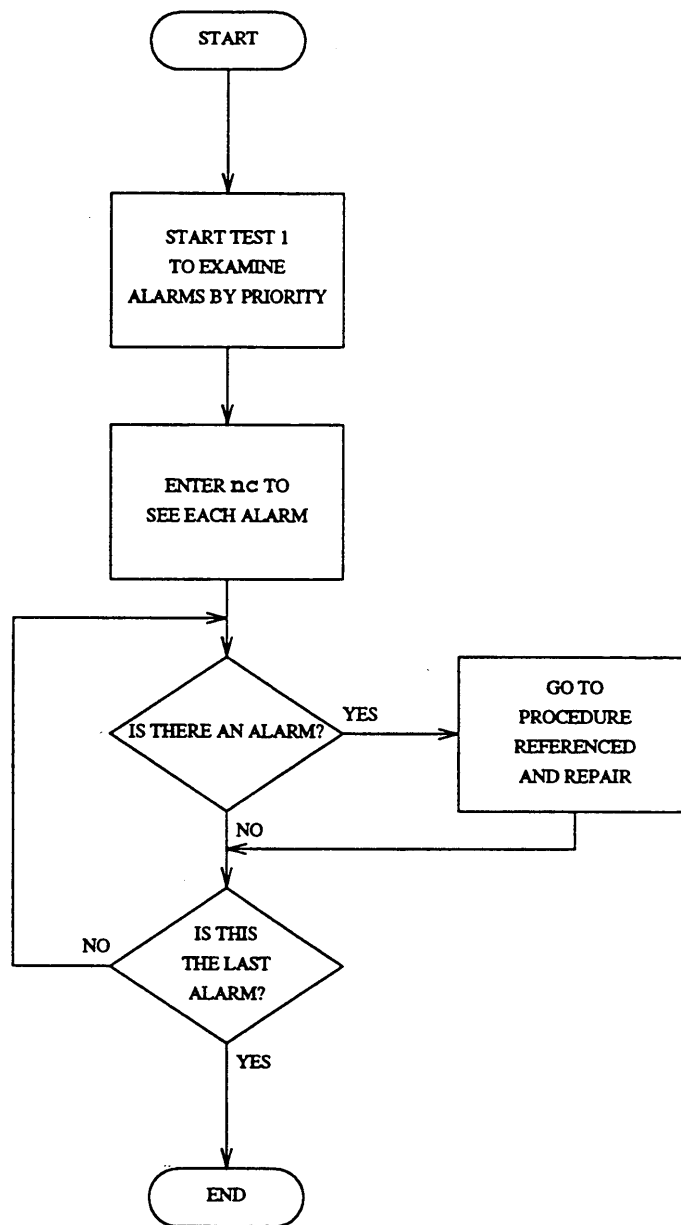
Figure 3-1. To Examine the PMIDS Error Log

START

START TEST 2
TO FIND
SWITCH ERRORS

ENTER nc TO
SEE EACH ERROR
OR ALARM

ARE THERE
AN EXCESSIVE NUMBER
OF ERRORS FOR A
UNIT TYPE?

YES

GO TO
REPAIR STRATEGIES
DOCUMENT AND REPAIR

NO

IS THIS
THE LAST
ERROR?

NO

YES

END
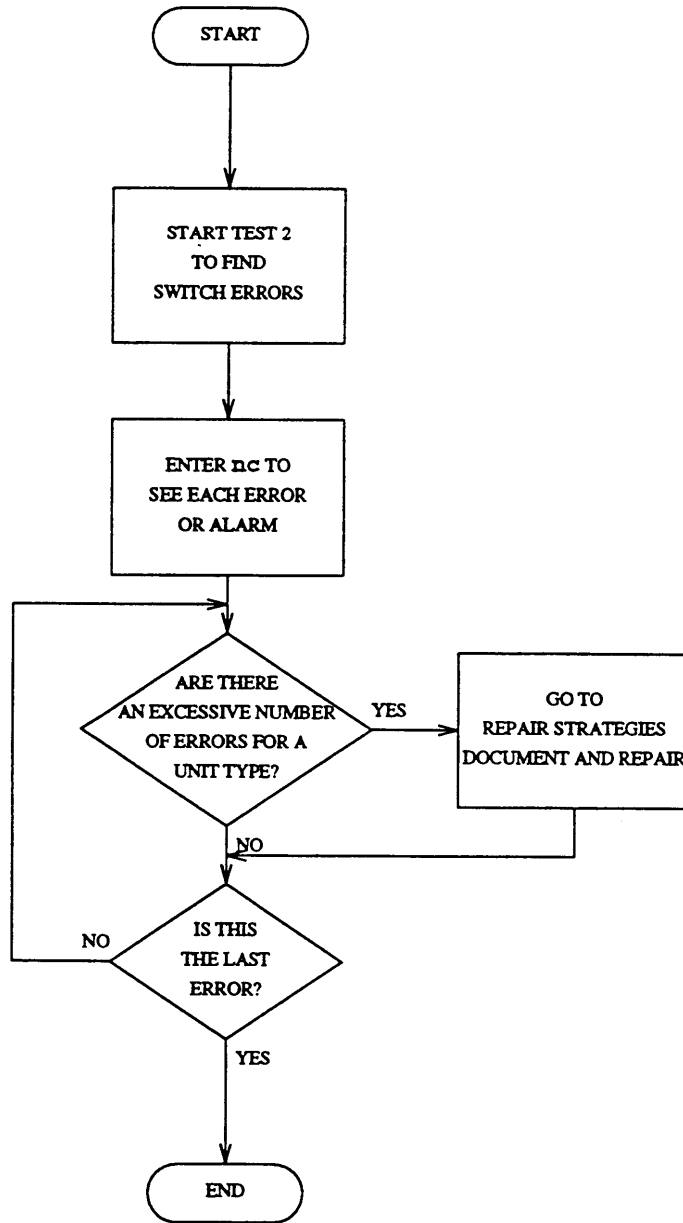
Figure 3-2. To Clear Errors From The PMIDS Error Log

Test 1 - Operation

Use test 1 to examine alarms by priority and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter `t1`

   - Otherwise, enter `p600`

   The test 1 screen, similar to the following, appears.

```
        ENHANCED MODE - PROCEDURE: 600, TEST: 1
                   EXAMINE ALARMS BY PRIORITY

  2. Unit Type: ▢
                                      TIME STAMP
  EQUIPMENT LOCATION            11. Stamp Index:  ▢
    3. Module:  ▢               12.        Day:   ▢
    4. Cabinet: ▢               13.       Hour:   ▢
    5. Carrier: ▢               14.     Minute:   ▢
    6.  Slot :  ▢
    7. Circuit: ▢               15. Procedure Reference: ▢

  8.      Alarm Status:  ▢
  9. Number of Failures: ▢
  10.    Failure Index:  ▢




  Connected to CCO ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

  enter command: ▬
  |_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine Alarms by Priority

1. Enter x to sort active alarms in the PMIDS error log.

   WAIT appears on your screen as the switch sorts alarms by alarm level. Major alarms appear first, minor alarms appear second, and warnings appear last.

   Alarms are grouped by unit type in each alarm level. If two alarms have the same unit type and alarm level, the most recent alarm appears first.

   When the switch finishes sorting, WAIT disappears from your screen.

   > Field 10 shows the total number of active alarms. If there are no alarms, field 10 contains a 0. If field 10 contains a 99, there are 99 or more alarms.

2. Enter nc to see each alarm.

   > Field 2 shows the unit type of the alarm or error (see Table 3-l). Unit types appear in numerical order.

   > Fields 3-7 may show the equipment location of the circuit that raised the alarm, or may contain other data depending on the unit type (see Tables 3-4 through 3-10). If the unit type is 60, 61, 63, 64, 67, 73, or 81, the field descriptions for fields 3-7 do not match the description on your screen. If, for example, field 2 contains unit type 73, the dedicated connection number rather than the equipment location appears in fields 3-5.

   > Field 8 shows the alarm status (see Table 3-2).

   > Field 9 shows the number of times the alarmed entry failed.

   > Field 10 shows the number of alarms in the PMIDS error log, including the alarm on your screen. The number in field 10 decreases by one as you view each alarm.

   > Field 11 shows which time stamp you are viewing (see Table 3-3).

   > Fields 12-14 show the day, hour, and minute of the latest failure (when field 11 contains a 1).

   > Field 15 shows a two-digit reference to a maintenance procedure. The last two digits of the procedure appear in field 15. A 6 before the numbers in field 15 gives the full procedure number.

3. If you want to see other time stamps choose from the following:

   ● To see when the error first occurred in the switch, enter nd until field 11 contains a 2.

      Fields 12-14 show when the error first occurred.

   ● To see when the error became an alarm, enter nd until field 11 contains a 3.

      Fields 12-14 show when the error became an alarm.

4. Go to the maintenance procedure shown in field 15, repair the failure that caused the alarm, and then return to Procedure 600 Test 1.

   The switch carries the equipment location on your screen to Procedures 601, 611, 620, 622, 628, 646, 647, 648, and 651.

   If field 15 is empty, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for failures that are not alarmed.

5. If there are more alarms, repeat steps 2-5.

After you view all alarms, the switch dashes fields 2-14. If you enter `nc` again, field 10 shows the total number of alarms.

6. If you want to resolve alarms, go to *To Resolve Alarms.*

7. If you want to examine alarms by unit type, go to test 2.

8. If you want to examine resolved alarms, go to test 3.

To Resolve Alarms

You may want to resolve alarms from the alarm log if you find any invalid alarms.

1. If you want to resolve a single alarm from the PMIDS error log, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter `nc` until the alarm that you want to resolve appears.

2. If you want to resolve all alarms, make sure that the field 10 shows the total number of alarms.

   If field 10 does not show all alarms, enter x

   CAUTION
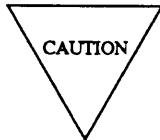
   Record each alarm, and all time stamps for each alarm, before you resolve them. Then you will have a switch failure history that you can use for future troubleshooting.

3. Enter `cdx` to resolve alarms.

   Field 8 contains a 5 if you resolve a single alarm (see Table 3-2).

   Field 10 shows the number of alarms still in the log and contains a 0 if you resolve all alarms.

   The switch marks the alarm resolved in the PMIDS error log. You can use test 3 to view resolved alarms.

   MAJOR and MINOR disappear from your screen if there is no other reason for them to be on. The switch turns off MAJOR and MINOR on the common-control alarm panel if there is no other reason for them to be on.

4. If you want to examine alarms by unit type and search for errors, go to test 2.

5. If you want to examine resolved alarms, go to test 3.

Test 2 - Operation

Use test 2 to examine alarms by unit type, to search for errors, and to delete alarms.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following.

    ● If you are not in the procedure, enter p600

    ● If you are already in the procedure, but not in test 2, enter t2

    The test 2 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 600, TEST: 2
                    EXAMINE ALARMS AND ERRORS BY UNIT TYPE

 2. Unit Type: ▢
                                        TIME STAMP
EQUIPMENT LOCATION                   11. Stamp Index: ▢
   3.   Module: ▢                    12.        Day: ▢
   4.  Cabinet: ▢                    13.       Hour: ▢
   5.  Carrier: ▢                    14.     Minute: ▢
   6.    Slot: ▢
   7. Circuit: ▢                     15. Procedure Reference: ▢

 8.       Alarm Status: ▢
 9. Number of Failures: ▢
10.      Failure Index: ▢




Connected to CCO ON-LINE ♥ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▢
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

The switch highlights field 2.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine Alarms and Errors by Unit Type

1. To select a unit type choose from the following:

    - Enter nu until the unit type you want to test appears.

        The first unit type with an error or alarm appears.

    - Enter cf2 and then enter the unit type in field 2.

2. Enter x to sort alarms.

    WAIT appears on your screen as the switch sorts alarms in the PMIDS error log by unit type. Alarms appear first and then errors for each unit type.

    Field 10 shows the number of alarms or errors. If there are no alarms or errors, field 10 contains a 0. If field 10 contains a 99, there are 99 or more alarms or errors in the PMIDS error log.

3. Enter nc to see each alarm or error.

    Field 2 shows the unit type of the alarm or error (see Table 3-l). Unit types appear in numerical order.

    Fields 3-7 may show the equipment location of the circuit that raised the alarm or may contain other data depending on the unit type (see Tables 3-4 through 3-10). If the unit type is 60, 61, 63, 64, 67, 73, or 81, the field descriptions for fields 3-7 do not match the descriptions on your screen. If, for example, field 2 contains unit type 73, the dedicated connection number rather than the equipment location appears in fields 3-5.

    Field 8 shows the alarm status (see Table 3-2).

    Field 9 shows the number of times the alarmed entry failed.

    Field 10 shows the number of alarms in the PMIDS error log, including the alarm on your screen. The number in field 10 decreases by one as you view each alarm.

    Field 11 shows which time stamp you are viewing (see Table 3-3).

    Fields 12-14 show the day, hour, and minute of the latest failure (when field 11 contains a 1).

    Field 15 shows a two-digit reference to a maintenance procedure. The last two digits of the procedure appear in field 15. A 6 before the numbers in field 15 gives the full procedure number.

4. To see other time stamps choose from the following:

    ● To see when the error first occurred in the switch, enter `nd` until field 11 contains a `2`.

        Fields 12-14 show when the error first occurred.

    ● To see when the error became an alarm, enter `nd` until field 11 contains a `3`.

        Fields 12-14 show when the error became an alarm.

5. Go to the maintenance procedure shown in field 15, repair the failure that caused the alarm, and then return to this test.

    The switch carries the equipment location to Procedures 601, 611, 620, 622, 628, 646, 647, 648, and 651.

    If field 15 is empty, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for failures that are not alarmed.

6. If there are more alarms or errors in the PMIDS error log, repeat steps 3-6.

    After you view all alarms the switch dashes fields 2-14. If you enter `nc` again, field 10 shows the total number of alarms.

7. If you want to examine alarms for another unit type, repeat steps 1-7.

8. If you want to delete alarms, go to *To Delete Errors and Alarms.*

9. If you want to examine alarms by alarm priority, go to test 1.

10. If you want to examine resolved alarms, go to test 3.

To Delete Errors and Alarms
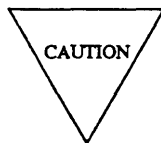
CAUTION
Deleting an entry from the PMIDS error log is not a normal maintenance practice. Record and investigate each entry before you delete it from the PMIDS error log. If you delete an entry, all switch history for the entry will be lost.

1. Make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter `nc` until the alarm appears.

2. Enter `cdx` to delete the alarm from the PMIDS error log.

    The switch deletes the alarm history from PMIDS.

        Field 10 shows the number of alarms and errors still in the PMIDS log.

    MAJOR and MINOR disappear from your screen if there is no other reason for them to be on. The switch turns off MAJOR and MINOR on the common-control alarm panel if there is no other reason for them to be on.

3. If you want to examine alarms by alarm priority, go to test 1.

4. If you want to examine resolved alarms, go to test 3.

Test 3 - Operation

Use test 3 to examine resolved alarms in the PMIDS error log and to delete alarms.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following.

   • To start the procedure, enter `p600`

   • If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 600, TEST: 3
                     EXAMINE  RESOLVED  ALARMS

 2. Unit Type:  ▢

                                  TIME STAMP
EQUIPMENT LOCATION                11. Stamp Index: ▢
   3.   Module: ▢                 12.        Day:  ▢
   4.  Cabinet: ▢                 13.       Hour:  ▢
   5.  Carrier: ▢                 14.     Minute:  ▢
   6.     Slot: ▢
   7.  Circuit: ▢

 8. Alarm Status: ▢
 9.         Number of Failures:  ▢
10. Number of Resolved Alarms:   ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

   The switch highlights field 2.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine Resolved Alarms

1. To select a unit type choose from the following:

   - Enter `nu` until the unit type you want appears in field 2.

     The first unit type with an alarm or error appears.

   - Enter `cf2` and then enter the unit type in field 2.

2. Enter `x` to sort resolved alarms.

   WAIT appears on your screen as the switch sorts resolved alarms by unit type.

   > Field 10 shows the number of resolved alarms. If there are no resolved alarms, field 10 contains a `0`. If field 10 contains a 99, there are 99 or more resolved alarms in the PMIDS error log.

   If there are no resolved alarms with the unit type you selected, the switch dashes fields 3-7, 9, and 11-15.

3. Enter `nc` to see each resolved alarms.

   > Field 2 shows the unit type of the alarm or error (see Table 3-l). Unit types appear in numerical order.

   > Fields 3-7 may show the equipment location of the circuit that raised the alarm or may contain other data depending on the unit type (see Tables 3-4 through 3-10). If the unit type is 60, 61, 63, 64, 67, 73, or 81, the field descriptions for fields 3-7 do not match the description on your screen. If, for example, field 2 contains unit type 73, the dedicated connection number rather than the equipment location appears infields 3-5.

   > Field 8 contains a 5 (see Table 3-2).

   > Field 9 shows the number of times the alarmed entry failed.

   > Field 10 shows the number of resolved alarms in the PMIDS error log, including the alarm on your screen. The number in field 10 decreases by one as you view each alarm.

   > Field 11 shows which time stamp you are viewing (see Table 3-3).

   > Fields 12-14 show the day, hour, and minute when the alarm was resolved (when field 11 contains a 1).

4. If you want to see other time stamps choose from the following:

   - To see when the error first occurred in the switch, enter `nd` until field 11 contains a `2`.

     > Fields 12-14 show when the error first occurred.

   - To see when the error became an alarm, enter `nd` until field 11 contains a `3`.

     > Fields 12-14 show when the error became an alarm.

5. If this is not the last resolved alarm, repeat steps 3-5.

   After you view all alarms, the switch dashes fields 2-14. If you enter `nc` again, field 10 shows the total number of alarms.

6. If you want to select another unit type, repeat steps 1-6.

7. If you want to examine alarms by alarm priority location, go to test 1.

8. If you want to examine alarms by unit type, go to test 2.

9. If you want to clear resolved alarms from the log, go to *To Delete Resolved Alarms.*

To Delete Resolved Alarms

You may want to delete resolved alarms from the alarm log if you find any invalid resolved alarms.
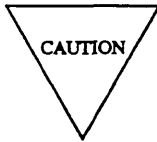
CAUTION — Deleting an entry from the PMIDS error log is not a normal maintenance practice. Record and investigate each entry before you delete it from the PMIDS error log. If you delete an entry, all switch history for the entry will be lost.

1. If you want to delete all resolved alarms, make sure that field 10 shows the total number of resolved alarms.

   If field 10 does not show the total number of resolved alarms, enter x

2. If you want to delete a single resolved alarm make sure that the resolved alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter nc until the alarm that you want to delete appears.

3. Enter cdx to delete resolved alarms from the log.

   The switch deletes all resolved alarms from the PMIDS error log.

   Field 8 contains a 0 (see Table 3-2).

   Field 10 shows the number of resolved alarms still in the log. Field 10 contains a 0 if you deleted all resolved alarms.

4. If you want to examine alarms by alarm priority, go to test 1.

5. If you want to examine alarms by unit type, go to test 2.

TABLE 3-1

Field 2 Unit Type		
1 =Environment	27 = General-purpose port (GPP)	56 = Intermodule data store (IDS)
2 = Disk Tape System (DTS)	28 = 72 series (MFET) port	57 = Light guide interface (LGI)
3 = Initialization causes	29 = Line circuit	58=Fan in (FT)
4 = Common control I/O	30 = Even port peripherals	59 = TMS maintenance
5=Memory	31 = Auxiliary tone plant	60 = Diagnostic processor/remote interface
6 = Module control channel (MCC)	32 = CO trunk (hardware)	61 = Configuration audits
7 = Time multiplexed switch or module processor (TMS or MP)	33 = DID trunk (hardware)	62 = Analog/digital facility test (ADFTC)
8 = Maintenance interface	34 = Tie trunk/data port (hardware)	63 = External equipment
9 = Module clock	35 = Digital trunk	64 = External processor
10 = Time slot interchanger (TSI) - ALU	36 = Digital user problem	65 = Modem pooling
11= Time slot interchanger (TSI) - PSTORE	37 = Calling number display	66 = Tone detector 2
12 = I/O bus interface (IOBI)	38 = Real time clock synchronizer	67 = Undefined exception FIFO errors
13 = Port data store (PDS)	39 = Force administration display system (FADS)	68 = DS1
14= Port control interface (PCI)	40 = Nonnetwork peripherals	69 = Multifunction analog terminal (MFAT)
15 = Port data interface (PDI)	41 = Trunk software	70 = Automatic transmission measurement system (ATMS)
16 = Tone plant	42 = calls aborted	71 = Remote module interface (RMI)
17 = Attendant console	44 = Attendant console interface	72 = EIA interface
18 = Cache memory	45 = Auxiliary trunk	73 = Dedicated switch connection (DSC)
19 = Data communications interface unit (DCTU)	46 = Attendant conference	74 = Remote carrier group (RCG)
20 = Station message detail recorder (SMDR)	48 = Odd port peripherals	75 = Primary rate interface (PRI)
21= Automatic number identification (ANl)	50 = TMS clock oscillator (TCO)	76 = ISDN error processing
22 = Processor duplication (501 CC)	51 = Local clock lamination (LCT)	77 = Processor communication circuit (PCC)
23 = TMS or network duplication channel	52 = System clock synchronize (SCS)	78 = Basic rate interface (BRI)
24 = Touch-tone sender	53 = Multiplexer (MPX)	79 = Basic rate interface terminal (BRIT)
25 = Touch-tone receiver	54 = Fan out (FO)	80 = Universal bus interface (UBI)
26 = Network I/O	55 = Module interface (MI)	81 = Universal bus (UBI)
		83 = Network processing element (NPE)

Procedure Fields

The fields listed below are data entry fields.

- In test 2 and 3 you can type the unit type in field 2.

The meanings of the fields are:

2.	Unit Type	Shows the unit type of the circuit in fields 3-7. Table 3-1 shows the unit type encodes.
3-7	EQUIPMENT LOCATION	Shows the equipment location of the circuit that raised the alarm or other data if the unit type is 60, 61, 63, 64, 67, 73, 81, or 82. Tables 3-4 through 3-10 show the other data that may appear in fields 3-7.
8.	Alarm Status	Shows the alarm status. All alarms start as errors detected by maintenance switch software. Table 3-2 lists the alarm status encodes.
9.	Number of Failures	Shows the number of times that the circuit in fields 3-7 failed.
10.	Failure Index	Shows the number of alarms in the PMIDS error log. The number in field 10 decreases by one as you view each alarm. If this field contains a 99, there are 99 or more alarms in the PMIDS error log.

11-14.   TIME STAMP   Field 11 shows which time stamp you are viewing in fields 12-14. The hour in field 13 is shown using a 24-hour clock.

- If field 11 contains a 1, fields 12-14 show when the alarm last occurred in the switch or when the alarm was resolved.
- If field 11 contains a 2, fields 12-14 show when the alarm first occurred in the switch.
- If field 11 contains a 3, field 12-14 show when the error became an alarm.

Table 3-3 lists the stamp index encodes.

15.   Procedure Reference   Shows the maintenance procedure you should use to isolate the failure.

The last two digits of the procedure appear in field 15. A 6 before the numbers in field 15 gives the full procedure number.

TABLE 3-2

Field 8 Alarm Status		
0	=	No errors recorded
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarms resolved

TABLE 3-3

Field 11 Stamp Index		
1	=	Latest failure or time resolved
2	=	Error appeared
3	=	Error alarmed

TABLE 3-4

Unit type 60 - Diagnostic Processor/Remote Interface		
Field	**Encode**	**Description**
3	0-30	Module number
4	0-7	Cabinet number
5	0-3	Carrier number
6	22, 31, 32	Slot number

TABLE 3-5

Unit Type 61- Configuration Audits		
Field	**Encode**	**Description**
3		**Configuration audit fault code**
	1	Control register on memory board 0
	2	Control register on memory board 1
	3	Control register on memory board 2
	4	Control register on memory board 3
	5	Control register on memory board 4
	6	Control register on memory board 5
	7	Control register on memory board 6
	8	Control register on memory board 7
	17	501CC write protect
	18	Scamper write protect
	19	Duplicate controller write protect
	23	Fetch protect boundary
	24	Double write select register
	25	Double write enable register (control register)

TABLE 3-6

Unit Type 63- External Equipment		
Field	**Encode**	**Description**
3	1-32	Unit number of external equipment
4	1-8	External equipment encode

TABLE 3-7

Unit Type 64 - External Processor		
Field	**Encode**	**Description**
3	1-32	Unit number of external processor

TABLE 3-8

Unit Type 67- Undefined Exception FIFO Code		
Field	**Encode**	**Description**
3	0-30	Module Number
6		Undefined exception FIFO code
	1	Port type incompatible with error code
	2	Error code not defined
	3	Touch tone digit send error
	4	Network order error
	5	Digit collecting on for an inappropriate board type
	6	Ringing is on for an inappropriate board type
	7	Invalid module interface number reported
	8	Error code not defined
	9	Illegal connection
	10	Illegal busy out
	11	Administration error
	12	Network order error

TABLE 3-9

Unit Type 73 - Dedicated Switch Connection		
Field	**Encode**	**Description**
3	0-99	Dedicated switch connection number †
4	0-9	Dedicated switch connection number
5	0-9	Dedicated switch connection number
7	1	Fatal error (connection broken). Repair attempt failed.
	2	Nonfatal error (connection intact). Repair attempt failed.
	3	Fatal error (connection broken). Repaired by system audit.
	4	Nonfatal error (connection intact). Repaired by system audit.

† To get the dedicated switch connection number read fields 3-5 as one field

TABLE 3-10

Unit Type 81- Universal Bus		
Field	**Encode**	**Description**
3	0-30	Network cabinet module
4		**Universal bus number**
	1	TDM Bus A
	2	TDM Bus B
	3	LAN Bus

PROCEDURE 601 - ENVIRONMENTAL TESTS

Purpose

Use Procedure 601 to examine the environmental failure history log, to resolve environmental alarms, and to test cabinets for environmental failures.

Tests

Procedure 601 has two tests.

- Use test 1 to examine the environmental failure history log and to resolve alarms.

- Use test 2 to test a cabinet or a range of cabinets for environmental failures.

Procedure Overview

The switch software periodically monitors the environmental condition of all switch cabinets (including time multiplexed switch (TMS) cabinets, common-control cabinets, and network cabinets), to detect environmental failures. Alarms appear if the switch software finds a problem with the cabinet or module-control carrier (MCC) power, including the fuse, the circuit breaker, or the DC-DC converter, with the frequency generator, with the flow of air (causing abnormal temperatures), or if there is a battery holdover. Procedure 601 does **not** monitor auxiliary cabinets or any cabinets that do not have ports or MCCs (except for the TMS and common-control cabinets).

In a duplicated network system, use test 1 to examine environmental alarms in both the on-line and off-line MCCs.

Use test 2 to test for environmental alarms in a system cabinet, a network cabinet, or in a range of cabinets. Use test 2 to get information from an on-line or off-line MCC in a switch with an unduplicated MCC. You may find a remote XE module connected to a G2 system or as small carriers serving remote sites. There are some significant differences between traditional or universal modules and XE modules. An XE module contains 18 slots instead of 21, the MCC circuit packs are in different physical slots, and there are different environmental alarms.

An XE module can contain up to four modular XE cabinets. The bottom cabinet holds a duplicated or unduplicated XE module control. The other three cabinets are standard XE port cabinets. Use the following flowchart to guide you from test to test. You may want to remove it and refer to it as you use this procedure.
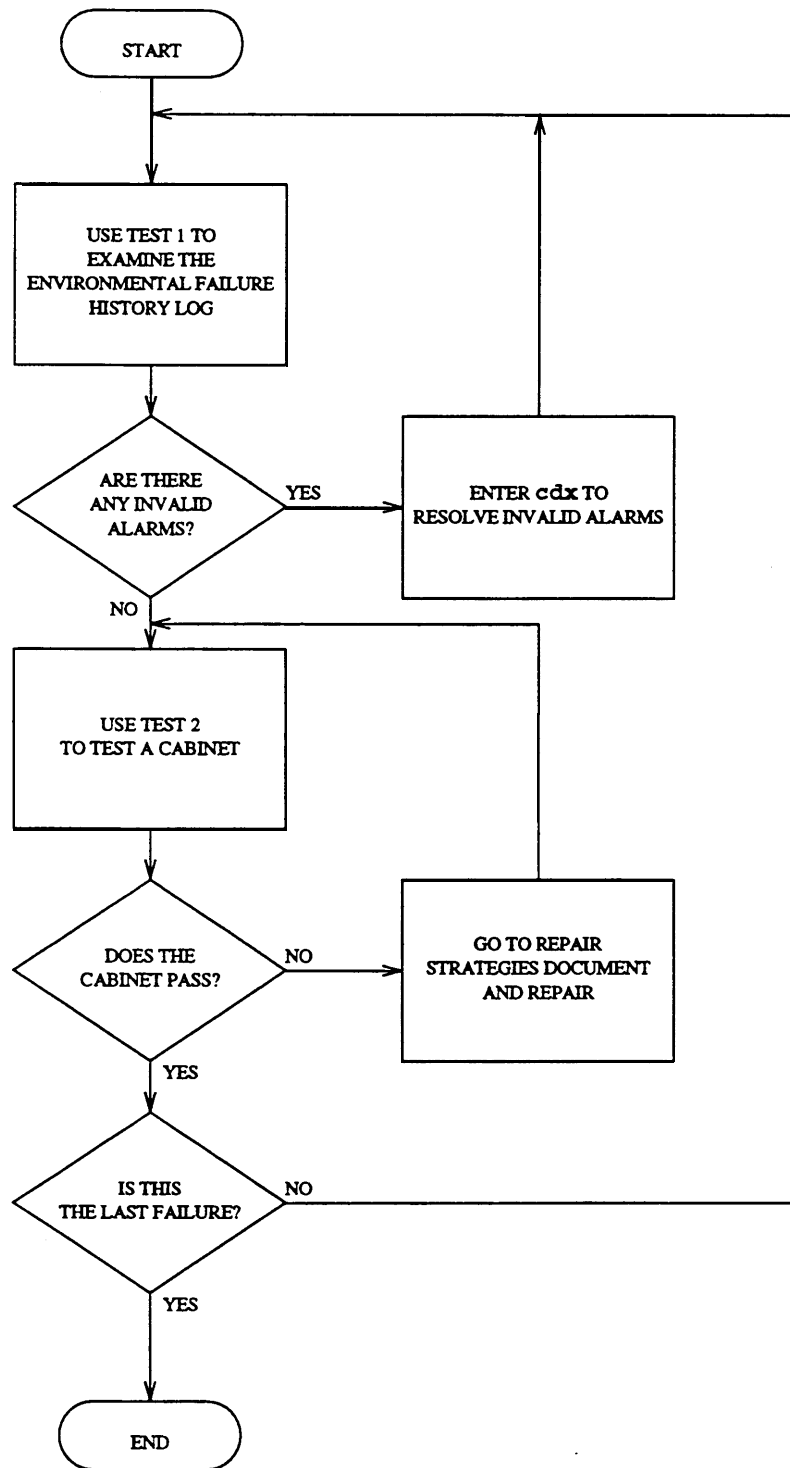
```
                    ┌─────────┐
                    │  START  │
                    └─────────┘
                         │
                         ▼
              ┌──────────────────────┐
              │      USE TEST 1 TO    │
              │      EXAMINE THE      │
              │  ENVIRONMENTAL FAILURE│
              │      HISTORY LOG      │
              └──────────────────────┘
                         │
                         ▼
                    ╱─────────╲
                   ╱ ARE THERE ╲      YES    ┌──────────────────────┐
                  ╱  ANY INVALID ╲──────────▶│     ENTER cdx TO     │
                   ╲   ALARMS?   ╱           │ RESOLVE INVALID ALARMS│
                    ╲─────────╱              └──────────────────────┘
                      │ NO
                      ▼
              ┌──────────────────────┐
              │      USE TEST 2      │
              │   TO TEST A CABINET  │
              └──────────────────────┘
                      │
                      ▼
                 ╱─────────╲
                ╱ DOES THE  ╲    NO    ┌──────────────────────┐
                ╲CABINET PASS?╱───────▶│     GO TO REPAIR     │
                 ╲─────────╱           │  STRATEGIES DOCUMENT │
                      │                │      AND REPAIR      │
                      │ YES            └──────────────────────┘
                      ▼
                 ╱─────────╲
                ╱  IS THIS  ╲   NO
                ╲THE LAST FAILURE?╲──────▶
                 ╲─────────╱
                      │ YES
                      ▼
                 ┌─────────┐
                 │   END   │
                 └─────────┘
```

Figure 3-3. To Do Environmental Tests and to Resolve Alarms

Test 1- Operation

Use test 1 to examine the environmental failure history log and to resolve alarms.

In test 1 you can:

View the test 1 screen	*page 3-29*
Examine the environmental failure history log	*page 3-30*
Resolve alarms	*page 3-31*

To View the Test 1 Screen

1. To see the test 1 screen choose from the following:

  ● If you are already in the procedure, but not in test 1, enter t1

  ● Otherwise, enter p601

  The test 1 screen, similar to the following, appears.

```
        ENHANCED MODE – PROCEDURE: 601, TEST: 1
          EXAMINE ENVIRONMENTAL FAILURE HISTORY LOG


EQUIPMENT  LOCATION                    16. Number of Cabinets: [---]
   2.   Module:[--]                     17. Number of Failures: [---]
   3.   Cabinet:[-]                      18.       Failure Index: [---]
 4. Module Control Carrier Type:[-]
CABINET  COMPONENT ALARMS
         TRADITIONAL          I UNIVERSAL MODULE    XE   MODULE
     5. AC Power              I High Batt Charge Rate I Not Used:        [-]
     6. 48 Volt Dc            I Not  used            I Not  used:        [-]
     7. Fuse or Breaker       I Battery Reserve Unit I Battery Reserve Unit [-]
     8. DC to DC Converter    I Power Unit Shutdown   I XE fault:         [-]
     9. Frequency Generator   I Ring Voltage          I Ring  Voltage:    [-]
    10. Air Flow Alarm        I Air  Flow  Alarm     I Not Used:          [-]
    11. Temperature Alarm     I Temperature  Alarm   I Not Used:          [-]
    12. Holdover              I Battery  Reserve     I Battery  Reserve:  [-]
    13. MCC Power on Left     I Not  used            I Not Used:          [-]
    14. MCC Power on Right    I Not  Used            I Not Used:          [-]
  15. Alarm Status [-]


Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ⌐
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS]
```

Field 16 shows the number of translated cabinets in the switch (not the number of physical cabinets).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Environmental Failures History Log

1. Enter x to sort the environmental failures history log.

   The switch sorts environmental failures by alarm priority. Major alarms appear first, followed by minor alarms. Errors appear last.

   Field 16 shows the number of translated cabinets in the switch.

   Field 17 shows the number of cabinets with environmental alarms. If there are no cabinets with environmental alarms, field 17 contains a 0.

2. Enter nc to see each alarm.

   Fields 2 and 3 show the equipment location of the cabinet with failures.

   Fields 5-14 contain a 0 if a hardware environmental component passes, or a 1 if a component fails.

   Field 15 shows the alarm status (see Table 3-12).

   Field 16 shows the number of translated cabinets in the switch.

   Field 17 shows the number of cabinets with environmental failures.

   Field 18 shows which cabinet failure you are viewing, including the failure on your screen. The number in field 18 decreases by one as you view each failure.

3. Go to test 2 and test the cabinet that failed.

4. If there are more alarms repeat steps 2-4.

   After you view all alarms, the switch dashes fields 2-18. If you enter nc again, the summary appears.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to test a cabinet or a range of cabinets, go to test 2.

To Resolve Alarms

You may want to resolve invalid alarms from the environmental failures history log.

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter `x` and then enter `nc` until the alarm you want to resolve appears.
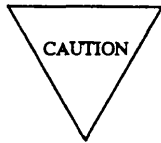
⟨CAUTION⟩ Record all environmental failures before you resolve them from the log. Then you will have a switch failure history that you can use for future troubleshooting.

2. If you want to resolve all alarms, make sure that field 17 shows the total number of alarms.

    If field 17 does not show the total number of alarms, enter `x`

3. Enter `cdx` to resolve alarms.

    Field 15 contains a 5 if you resolved a single alarm (see Table 3-12).

    If you enter x again, field 17 shows the number of alarms still in the log. If you resolved all alarms, field 17 contains a 0.

    The switch marks environmental alarms resolved. The switch turns off **PWR/TEMP AIR FLOW** on the common-control alarm panel if there is no other reason for it to be on. MAJOR or MINOR disappear from your screen if there is no other reason for them to be on.

4. If you want to test a cabinet or a range of cabinets, go to test 2.

Test 2 - Operation

Use test 2 to test a range of cabinets or all cabinets in the switch for environmental alarms.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following.

   - To start the procedure, enter p601

   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 601, TEST: 2
                      TEST FOR ENVIRONMENTAL ALARMS


EQUIPMENT LOCATION                        16.  Number  of  Cabinets ---
   2.  Module: --                         17.  Number  of  Failures ---
   3.  Cabinet: -                          18.       Failure Index: ---
 4.  Module  Control  Carrier  Status
CABINET COMPONENT ALARMs
          TRADITIONAL          I UNIVERSE   MODULE      I XE  MODULE
     5.  AC Power             IHigh Batt Charge Rate INot  Used:       -
     6.  48 Volt DC           INot  Used            INot  Used:        -
     7.  Fuse or Breaker      IBattery Reserve Unit IBattery Reserve Unit -
     8.  DC to DC Converter   IPower  Unit  Shutdown IXE  fault:       -
     9.  Frequency Generator  IRing Voltage          IRing  Voltage:   -
    10.  Air Flow Alarm       IAir  Flow  Alarm     INot  Used:        -
    11.  Temperature Alarm    ITemperature  Alarm   INot  Used:        -
    12.  Holdover             IBattery  Reserve     I Battery  Reserve: -
    13.  MCC Power on Left     INot  Used           INot  Used:        -
    14.  MCC Power on Right    INot  Used           INot  Used:        -
  15.  Alarm Status: -


Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT


enter command: _
|        ||        ||F3 DATA ||        ||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

The switch highlights field 2.

Fields 2 and 3 may contain a default equipment location from test 1 or from Procedure 600 Test 1 or 2.

Field 16 shows the number of translated cabinets in the switch.

To find the meanings of any field on your screen go to *Procedure Fields* at the end of this procedure.

To Select a Cabinet or a Range of Cabinets

1. To select a cabinet choose from the following:

   ● Enter `cf2` and enter the module and the cabinet.

   ● Enter `nc` until the cabinet you want to test appears.

2. To select all cabinets in a module enter `cf2` and enter the module number in field 2.

   The switch tests all cabinets in the module that you selected.

3. If you want to test the entire switch, enter `cf2 ; ;`

   The switch starts with the first module and first cabinet in the switch and then tests all cabinets in the switch.

4. If you selected a cabinet, go to *To Test a Cabinet.*

5. If you selected a range of cabinets, go to *To Test a Range of Cabinets.*

To Test a Cabinet

1. Make sure that you have selected a cabinet to test.

2. Enter x to test the cabinet.

   WAIT appears on your screen as the switch tests the cabinet. When the test is complete, WAIT disappears from your screen.

      Fields 2 and 3 show the equipment location of the cabinet you selected.

      Field 4 contains a 1 or a 3 if the switch can read the on-line module-control carrier (see Table 3-11).

      Fields 5-14 show the status of each hardware component (0 = pass, 1 = alarmed).

      Field 15 shows the alarm status of the cabinet you selected (see Table 3-12).

      Field 16 contains a 1 if the switch can test the cabinet you selected.

      Field 17 contains a 0 if the cabinet passed or a 1 if the cabinet failed.

3. To view status from either the on-line and off-line module-control carrier, enter nu and then enter x

      Field 4 shows the MCC status. Field 4 contains a 0 or a 2 if you are viewing the status from the off-line carrier or a 1 or 3 if you are viewing the status from the on-line module-control carrier (see Table 3-11).

      Field 15 shows the alarm status from the off-lie module-control carrier.

   If the module control is not duplicated, special error code 74 or error code 6 appears.

4. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 1.

   After you repair all environmental failures, the switch marks environmental alarms resolved. The switch turns off **PWR/TEMP AIR FLOW** on the common-control alarm panel if there is no other reason for it to be on. MAJOR and MINOR disappear from your screen if there is no other reason for them to be on.

5. If you want to test a different cabinet, go to *To Select a Cabinet or Range of Cabinets.*

6. If you want to examine the environmental failure history log or clear alarms, go to test 1.

To Test a Range of Cabinets

1. Make sure that you have selected a range of cabinets to test.

2. Enter x to test the range.

   WAIT appears on your screen as the switch tests the range. The numbers in the following fields change as the switch tests each cabinet in the range.

   > Fields 2 and 3 show the equipment location of the cabinet that the switch is testing.

   > Field 16 shows the number of cabinets tested.

   > Field 17 shows the number of failures. If there are no failures, field 17 contains a 0.

   If you want to stop the test before the range has been tested, enter s

   > Fields 2 and 3 show the last module and cabinet tested.

   > Field 16 shows the number of cabinets the switch tested.

   > Field 17 shows the number of failures.

   You can enter nc to examine failure data or select a new range. You cannot continue the test. You must select the range and test it again.

   After the switch tests the range, WAIT disappears from your screen.

3. Enter nc to see each failure.

   > Fields 2 and 3 show the equipment location of the cabinet that failed.

   > Field 4 shows the MCC status (see Table 3-11).

   > Fields 5-14 show the status of each hardware component (0 = pass, 1 = alarmed). Note that one cabinet failure may affect others.

   > Field 15 shows the alarm status of the failing cabinet (see Table 3-13).

   > Field 16 shows number of cabinets the switch tested.

   > Field 17 shows the number of cabinets that failed.

   > Field 18 shows which cabinet failure you are viewing, including the failure on your screen.. The number in field 18 decreases by one as you view each failure.

4. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 1.

   After you repair all environmental failures, the switch marks all major or minor cabinet alarms resolved The switch turns off the **PWR/TEMP AIR FLOW** alarm indicator if there is no other reason for it to be on. MAJOR and MINOR disappear from your screen if there is no other reason for them to be on.

5. If this is not the last failure, repeat steps 3-5.

   After you view all failures, the switch dashes fields 2-18. If you enter nc again, field 16 shows the number of cabinets and field 17 shows the number of failures.

6. If you want to examine the environmental failure history log or resolve alarms, go to test 1.

Special Error Codes

While using Procedure 601 you may see the following special error codes.

- 80=There are no alarms in the failure history log.

    You are trying to clear alarms, but there are no alarms in the environmental failure history log.

- 81=The message transmission to the module processor failed.

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

TABLE 3-11.   **TABLE 3-12.**

Field 4 Module Control Carrier Status
0   = Off-line traditional module
1   = On-line traditional module
2   = Off-line universal module
3   = On-line universal module
4   = Off-line XE universal module
5   = On-line XE universal module

Field 15 Alarm Status
0   =   No errors recorded
1   =   Major
2   =   Minor
3   =   Warning
4   =   Errors recorded
5   =   Alarm resoved

Procedure Fields

The fields listed below are data entry fields.

● In test 2 you can select a module and cabinet in fields 2 and 3.

The meanings of the fields are:

2-3.	EQUIPMENT LOCATION	Shows the module and cabinet you are viewing.
4.	Module Control Carrier Type	In test 1, shows whether you are viewing a traditional, universal, or XE module-control carrier and in test 2 shows the type of module-control carrier and whether it is on-line or off-line. Table 3-11 shows the module control carrier encodes.
5-14.	CABINET ALARM	Fields 5-14 show the component status. A 0 appears if the component passes.
15.	Alarm Status	Shows the alarm status. Table 3-12 shows the alarm status encodes.
16.	Number of Cabinets	At first this field shows the number of translated cabinets. Then the number of cabinets that were tested appears.
17.	Number of Failures	In test 1, the number of cabinets with failures (up to 7) appears. In test 2, the number of cabinets that fail appear.
18.	Failure Index	Shows which failure you are viewing.

4. COMMON-CONTROL PROCEDURES

This chapter contains the common control procedures. Common-control procedures test the common control and associated components. Common-control procedures include Procedures 610-614, 616, and 618.

The following lists summarizes the purpose of each common-control procedure.

PROCEDURE 610 - DISK TAPE SYSTEM TESTS

Use Procedure 610 to examine the disk tape system (DTS) failure history log, to resolve alarms, and to test the disk tape system.

PROCEDURE 611 - COMMON CONTROL TESTS

Use Procedure 611 to examine the common-control failure history log, to resolve alarms, and to test the 4-MHz and dual speed data channels in the common-control cabinet.

PROCEDURE 612 - INITIALIZATION CAUSES

Use Procedure 612 to find why the switch initialized the common control, to resolve alarms, to clear the state of health registers in the periodic maintenance information data structure (PMIDS) error log, and to delete all failure history from the PMIDS error log.

PROCEDURE 613 - DUPLICATE PROCESSOR CONTROL AND TESTS

Use Procedure 613 to see why a switch with a duplicate common control processor has switched between common controls, to test the duplication channel, and to switch to the off-line processor.

PROCEDURE 614 - MAIN AND CACHE MEMORY TESTS

Use Procedure 614 to examine memory failures, to resolve alarm, and to test the main and cache memory.

PROCEDURE 616 - ALARM INDICATOR TESTS

Use Procedure 616 to test the alarm panel indicators when you suspect they are not working correctly.

PROCEDURE 618 - DIAGNOSTIC PROCESSOR AND REMOTE INTERFACE TESTS

Use Procedure 618 to examine the diagnostic processor failure history log, to resolve alarms, to test the diagnostic processor complex, to call the remote maintenance, administration, and traffic system (RMATS), and to check the remote interface.

PROCEDURE 610 - DISK TAPE SYSTEM TESTS

Purpose

Use Procedure 610 to examine the disk tape system (DTS) failure history log, to resolve alarms, and to test the disk tape system.

Tests

Procedure 610 has two tests.

- Use test 1 to examine the disk tape system failure history log and to resolve alarms.
- Use test 2 to test the disk tape system.

Procedure Overview

The DEFINITY Generic 2 uses a new disk tape system with a controller (the TN563 circuit pack), a 145-Mbyte hard disk, and a 125-Mbyte streaming tape drive. The disk tape system stores switch translations, generic code and patches, and on-line help.

The TN563 circuit pack periodically tests its on-board resources including its two serial ports, all internal cabling and all interface cables, the temperature of the disk tape system, and the condition of the tape cartridge. Periodic checking ensures that the disk tape system works when you need it.

If there is a problem with the DTS, MAJOR or MINOR may appear on your screen and TAPE may light on the common-control cabinet alarm panel.

Use test 1 to examine the disk tape system failure history log. Use test 2 to test the disk tape system. Test the disk tape system after you replace any DTS components.

Use the following flowchart to guide you from test to test. You may want to remove the flowchart during the test and refer to it as you use this procedure.
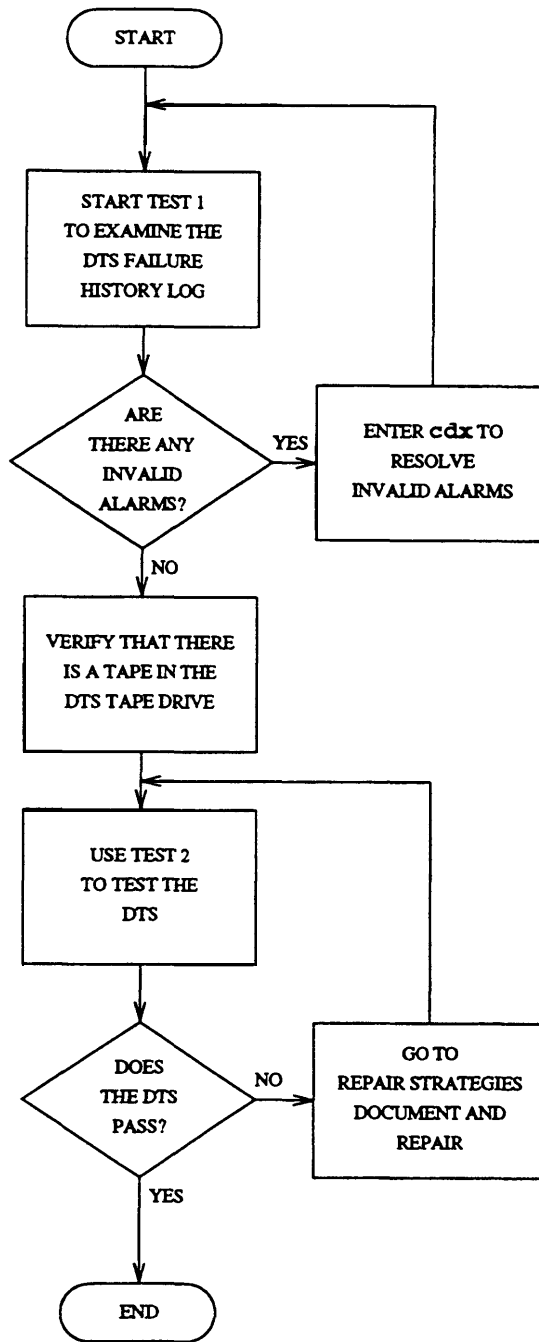
Figure 4-1. To Test the Disk Tape System

Test 1 - Operation

Use test 1 to examine the disk tape system failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    - If you are already in the procedure, but not in test 1, enter t1

    - Otherwise, enter p610

    The test 1 screen, similar to the following, appears.

```
         ENHANCED MODE - PROCEDURE: 610, TEST: 1
         EXAMINE THE DISK TAPE SYSTEM FAILURE HISTORY LOG

DISK TAPE SYSTEM EQUIPMENT              TIME STAMP
  2.   Circuit Pack TN563: ❏             13.    Day: ❏
  3.          Serial Port: ❏             14.   Hour: ❏
  4.           Disk Drive: ❏             15. Minute: ❏
  5. Fan Overtemperature: ❏
  6.           Tape Drive: ❏
  7.      Cable or Power: ❏             16. Hours Since Last Run Tape: ❏
  8.      Tape Cart ridge: ❏

 9.         Alarm Status: ❏
10.   Number of Failures: ❏
11.        Failure Index: ❏
12. Specific Fault Code: ❏




Connected to   ON-LINE ❤ MAJOR │ MINOR │ RUN TAPE │ BUSY OUT │ IN USE │ WAIT

snter command: _
│       │      │ F3 DATA │       │ F5 HELP │ F6 FIELD │ F7 INPUT │ F8 CMDS
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Disk Tape System Failure History Log

1. Enter x to sort the disk tape system failure history log.

   The switch sorts alarms by alarm severity.

      Field 10 shows the total number of alarms. If there are no DTS alarms, field 10 contains a 0.

      Field 16 shows the number of hours since the last run tape operation.

2. Enter nc to see each alarm.

      Fields 2-8 show the major components of the disk tape system. A 1 appears in one or more of these fields if a component failed.

      Field 9 shows the alarm status (see Table 4-l).

      Field 10 shows the number of alarms still in the log, including the alarm on your screen. The number infield 10 decreases by one as you view each alarm.

      Field 11 shows the specific fault code. Record this number.

      Fields 13-15 show when the component first failed.

      Field 16 shows the number of hours since the last run tape operation.

3. If you want to see when the component last failes, enter nd

      Fields 13-15 show when the component last failed.

4. If there are any failures, go to test 2 and test the disk tape system.

5. If the log contains more failures, repeat steps 2-5.

   After you view all alarms, the switch dashes all fields on your screen. If you enter nc again, field 10 shows the total number of alarms.

6. If you want to resolve alarms from the log, go to *To Resolve Alarms.*

7. If you want to test the disk tape system, go to test 2.
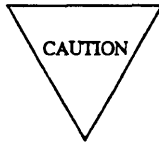
To Resolve DTS Alarms

You may want to resolve any invalid alarms from the disk tape system failure history log.

1. If you want to resolve all alarms, make sure that field 10 shows the total number of alarms.

   If field 10 does not show the total number of alarms, enter x

2. If you want to resolve a single alarm, make sure that the alarm you want to resolve is on your screen.

   If the alarm is not on your screen, enter x and then enter nc until the alarm you want to resolve appears.

CAUTION — Record all alarms and their time stamps before you resolve them from the disk tape system failure history log. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

   Field 9 contains a 5 if you resolved a single alarm (see Table 4-l).

   Field 10 shows the number of alarms still in the log. If you resolve all alarms, field 10 contains a 0.

   If you resolve all alarms, the switch marks all disk tape system alarms resolved. The switch turns off the TAPE light on the common-control cabinet alarm panel. MAJOR or MINOR disappear from your screen if there is no other reason for them to be on.

4. If you want to test the disk tape system, go to test 2.

Test 2 - Operation

Use test 2 to test the disk tape system.

In test 2 you can:

View the test 2 screen

Test the disk tape system

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following.

   ● To start the procedure, enter p61O

   ● If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
ENHANCED MODE - PROCEDURE: 610, TEST: 2
                TEST THE DISK TAPE SYSTEM


DISK TAPE SYSTEM EQUIPMENT
    2.   Circuit Pack TN563: ❏
    3.           Serial port: ❏
    4.            Disk Drive: ❏
    5. Fan Overtemperature: ❏
    6.            Tape Drive: ❏
    7.        Cable or Power: ❏
    8.        Tape Cartridge: ❏

10.    Number of Failures:   ┐
11.         Failure Index:   │
12. Specific Fault Code: ❏




Connected to cco ON-LINE ♡ ┌MAJOR┐ ┌MINOR┐ ┌RUN TAPE┐ ┌BUSY OUT┐ ┌IN USE┐ ┌WAIT┐

enter command:
┌──────┐┌─────┐┌F3 DATA┐┌───────┐┌F5 HELP┐┌F6 FIELD┐┌F7 INPUT┐┌F8 CMDS┐
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Disk Tape System

1. Make sure that there is a cartridge in the tape drive.

   If there is no cartridge in the drive, a component that works correctly may fail the test.

2. Enter x to test the disk tape system.

   WAIT appears on your screen as the TN563 circuit pack:

   - tests its on-board resources.

   - tests the readiness of each peripheral on the interface bus.

   - does a nondestructive read only test on the tape drive.

   - does a nondestructive read and write test to the disk drive.

   - does an on-board test of any idle serial port.

   The lights on the tape drive and the hard drive flash as the switch tests the disk tape system. The heartbeat LED on the TN563 stays off if it was off or stays on if it was on, depending on its state when you enter x

   Field 10 shows the number of failures. If the test passes, field 10 contains a 0.

   If all DTS components pass, the switch marks disk tape system alarms resolved. The switch turns off TAPE, MAJOR and MINOR on the common-control alarm panel if there is no other reason for them to be on.   MAJOR and MINOR disappear from your screen if there is no other reason for them to be on.

3. Enter nc to see each failure.

   Fields 2-8 show the recommended replacement order for the components that failed. A 1 shows the most severe failure.

   Field 10 shows the number of failures.

   Field 11 shows which failure you are viewing.

   Field 12 shows the specific fault code. Record this number.

4. lf there are any failures, go to *DEFINITY*™ *Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 2.

5. If there are more failures repeat steps 3-5.

   After you view all failures the switch dashes all fields on your screen. If you enter nc again the summary appears.

6. If you want to examine the disk tape system log or resolve alarms, go to test 1.

TABLE 4-1

Field 9 Alarm Status
1 = Major
2 = Minor
3 = Warning
4 = Errors recorded
5 = Alarm resolved

Procedure Fields

The meaning of the fields are:

2-8.	DISK TAPE SYSTEM EQUIPMENT	Field 2 contains a l if there is a problem with the DTS circuit pack. Field 3 contains a l if there is a problem with the serial port. Field 4 contains a 1 if there is a problem with the disk drive. Field 5 contains a 1 if the temperature is above the limit. Field 6 contains a 1 if there is a problem with the tape drive. Field 7 contains a 1 if there is a problem with the interface cable or power. Note that the switch tests the SCSI bus cable but does not test the serial port cable. Field 8 contains a 1 if there is a problem with the tape cartridge. Check to ensure that the cartridge is inserted.
		If a number other than 1 appears, ignore it. After you repair the first indictment, test the disk tape system again.
9.	Alarm Status	Shows the alarm severity. Table 4-1 lists the alarm status encodes.
10.	Number of Failures	Shows the number of failures in the disk tape system log.
11.	Failure Index	Shows you which failure you are viewing.
12.	Specific Fault Code	Shows the specific hardware or software component that failed. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.
13-15.	TIME STAMP	Shows the day, hour, and minute of the last failure. The hour is shown using a 24-hour clock.
16.	Hours Since Last Run Tape	Shows the number of hours since the tape was last run. If this field contains a 99, it has been 99 or more hours since the last run tape operation.

PROCEDURE 611 - COMMON-CONTROL TESTS

Purpose

Use Procedure 611 to examine the common-control failure history log, to resolve alarms, and to test the 4-MHz and dual-speed data channels in the common-control cabinet.

Tests

Procedure 611 has three tests.

- Use test 1 to see the failure history log of the 4-MHz channel, the dual-speed data channel and the I/O buffers, and to resolve common-control alarms.

- Use test 2 to test all 4-MHz and dual-speed data channels.

- Use test 3 to test a specific 4-MHz or dual-speed data channel continuously.

Procedure Overview

Periodically the switch does the following tests to test the 4-MHz and dual-speed data channels.

- Sends test data from the output to input on the TN402 and TN403 circuit pack without affecting any peripherals on the 4-MHz or dual-speed data channels.

- Sends test data to all peripherals on the 4-MHz channel.

- Sends test data to the 4-MHz and dual-speed data channels.

The data channels respond correctly if they receive good data, or raise an alarm if they receive bad data.

Use test 1 to examine any failures found by periodic maintenance software. Use test 2 to test all data channels. Note that if over 50 percent of the translated channels fail test 2, the switch indicts the I/O buffer circuit pack (TN404). A high failure rate usually means that the 4-MHz channel or the dual-speed data channel has failed.

Use test 3 if you suspect intermittent common-control channel failures.

Use the following flowchart to guide you from test to test. You may want to remove it during the test and refer to it as you use this procedure.
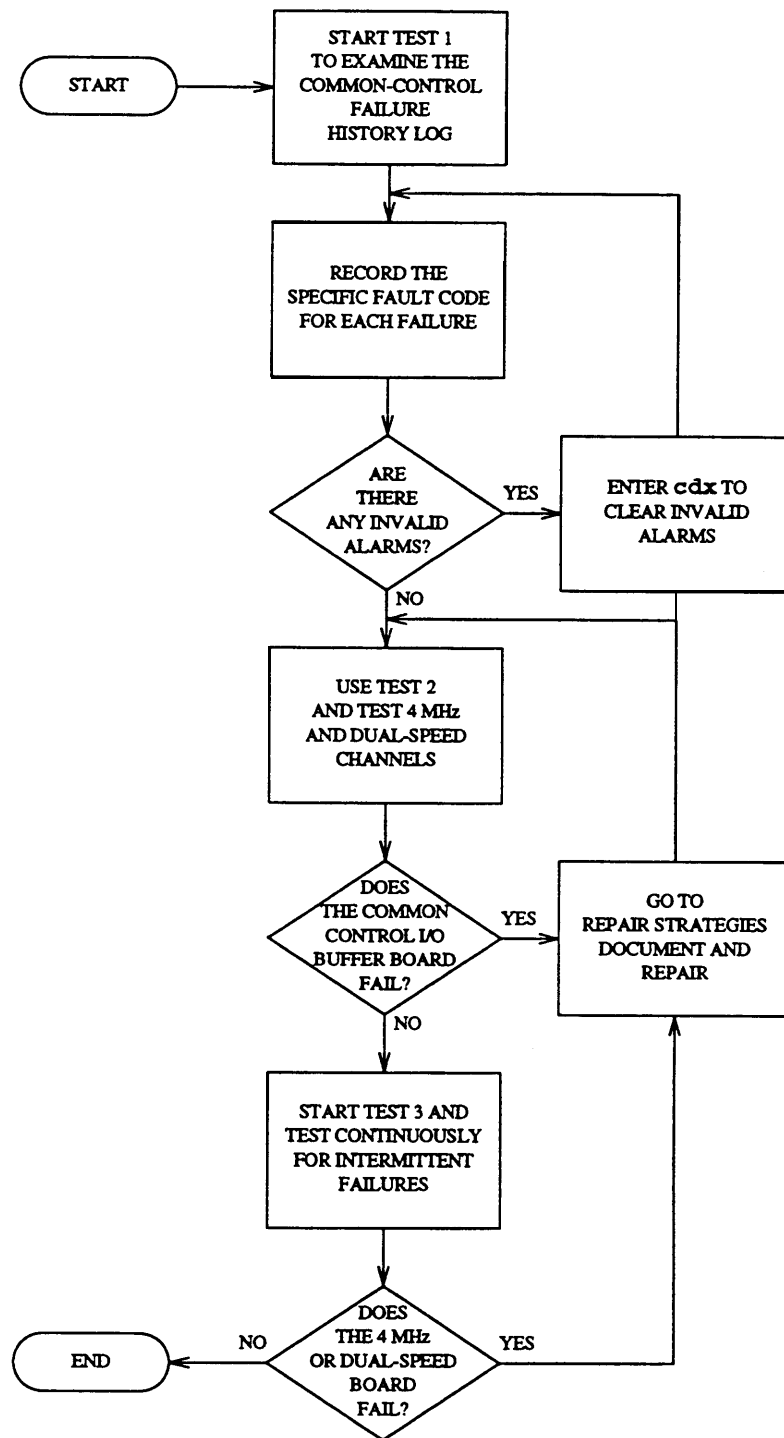
Figure 4-2. To Examine the Common-Control Failure History Log

Test 1 - Operation

Use test 1 to see the failure history log of the 4-MHz channel, the dual speed data channel and the I/O buffers, and to resolve common-control I/O channel alarms.

In test 1 you can:

View the test 1 screen	*page 4-15*
Examine the common-control failure history log	*page 4-16*
Resolve alarms	*page 4-17*

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter t1

   - Otherwise, enter p611

   The test 1 screen, similar to the following, appears.

```
               ENHANCED MODE - PROCEDURE: 611, TEST: 1
                EXAMINE THE COMMON CONTROL I/0 FAILURE HISTORY LOG


EQUIPMENT  LOCATION
   2.   Module:  ▢
   3.  Cabinet:  ▢
   4.  Carrier:  ▢
   5.     Slot:  ▢
   6.  Channel:  ▢


 7.                              Alarm Status: ▢
 8.                              Circuit Type: ▢
 9.                           Location Status: ▢
10.                        PMIDS Failure Index: ▢
.1.                        Specific Fault Code: ▢
.2.         Number of Translated I/0 channels: ▢
.3. Number of 1/0 Installed Circuit Packs: ▢




Connected to CCO ON-LINE  ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command:
[      ][      ][ F3 DATA ][      ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

To find the meaning of a field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Common-Control Failure History Log

1. Enter x to sort the common-control failure history log.

   The switch sorts the log by alarm status and by circuit type. Major alarms appear first, followed by minor alarms. I/O circuit pack alarms appear last.

   > Field 10 shows the total number of channel failures (up to six). If there are no failures, field 10 contains a 0.

   > Field 12 shows the number of translated channels.

   > Field 13 shows the number of I/O circuit packs (the number of 4-MHz and dual-speed circuit packs).

2. Enter nc to see each failure.

   > Fields 2-6 show the equipment location of the first channel that failed. If the failure on your screen is an I/O buffer circuit pack, the switch dashes field 6.

   > Field 7 shows the alarm status (see Table 4-2).

   > Field 8 shows the circuit type (see Table 4-3).

   > Field 9 shows the location status (see Table 4-4).

   > Field 10 shows which failure you are viewing. The number in field 10 decreases by one as you view each failure.

   > Field 11 shows the specific fault code. Record this number.

   > Field 12 shows the number of translated I/O channels.

   > Field 13 shows the number of 4-MHz and dual-speed circuit packs.

3. Go to test 2 and test the channel that failed.

4. If there are more failures, repeat steps 2-4.

   After you view all alarms the switch dashes all fields on your screen. If you enter nc again, field 10 shows the total number of alarms.

5. lf you want to resolve alarms, go to *To Resolve Alarms.*
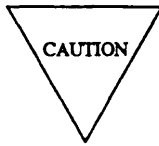
To Resolve Alarms

You may want to resolve any invalid alarms from the common-control failure history log.

1. If you want to resolve all alarms, make sure that field 10 shows the total number of channel failures.

   If field 10 does not show the total number of channel failures, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter nc until the alarm you want to resolve appears.

Record all common-control I/O channel failures and their time stamps before you resolve them. Then you will have a record you can use for future troubleshooting.

3. Enter cdx to resolve common-control alarms.

        Field 7 contains a 5 if you resolve a single alarm (see Table 4-2).

        Field 10 shows the number of alarms. Field 10 contains a 0 if you resolved all alarms and there are no errors.

   The switch marks the alarm resolved. The switch turns off I/O CHANNEL on the common-control alarm panel, if there is no other reason for it to be on. MAJOR disappears from your screen if there is no other reason for it to be on.

4. If you want to test all 4-MHz or dual-speed data channels, go to test 2.

5. If you want to test a single 4-MHz or dual-speed data channel continuously, go to test 3.

Test 2 - Operation

Use test 2 to test all 4-MHz and dual-speed data channels.

In test 2 you can:

To View the Test 2 Screen

1. If you want to see the test 2 screen choose one or both of the following.

   - To start Procedure 611, enter p611

   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 611, TEST: 2
                       TEST ALL COMMON CONTROL I/0 CHANNELS


EQUIPMENT  LOCATION
    2.  Module:  ▢
    3.  Cabinet: ▢
    4.  Carrier: ▢
    5.    Slot:  ▢
    6.  Channel: ▢


 7.         Alarm Status: ▢
 8.         Circuit Type: ▢
 9.      Location Status: ▢
10.  DMIDS Failure Index: ▢
11.  Specific Fault Code: ▢






Connected to CCO ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS ]
```

To find the meaning of a field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test all 4-MHz and Dual-Speed Data Channels

1. Enter x to test all 4-MHz and dual-speed data channels.

   WAIT appears on your screen as the switch tests the 4-MHz and dual-speed data channels.

   Field 10 shows the number of failures. If there are no failures, field 10 contains a 0.

   The switch turns on the green LED on circuit packs TN402 or TN403 if they pass and if the I/O buffer circuit pack TN404 passes.

2. Enter nc to see each failure.

   Fields 2-6 show the equipment location of the first channel that failed. If the failure on your screen is an I/O buffer circuit pack, field 6 is blank.

   Field 8 shows the circuit type (see Table 4-3).

   Field 9 shows the location status (see Table 4-4).

   Field 10 shows which failure you are viewing. The number in field 10 decreases by one as you view each failure.

   Field 11 shows the specific fault code. Record this number.

   The switch turns on the red LED on any circuit pack that fails. This LED stays on until you view the next failure. Note that if more than 50 percent of the translated channels fail, the switch turns on the red LED on the I/O buffer circuit pack.

3. If the common control fails, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 4.

   After you repair all failure, the switch marks all common-control I/O alarms resolved. The switch turns off COMMON CONTROL I/O CHANNEL on the common-control alarm panel if there are no other reasons for it to be on.   MAJOR and MINOR disappear from your screen if there are no other reasons for them to be on.

4. If this is not the last failure, repeat steps 2-4.

   After you view all failures, the switch dashes all fields on your screen. If you enter nc again, the failure summary appears.

5. If you want to examine the common-control failure history log, go to test 1.

6. If you want to test a single 4-MHz or dual-speed data channel continuously, go to test 3.

Test 3 - Operation

Use test 3 to test a 4-MHz channel or dual-speed data channel continuously. Test 3 indirectly tests the I/O buffer circuit pack (TN404).

In test 3 you can:

View the test 3 screen	*page 4-20*
Test a 4-MHz or dual-sped data channel continuously	*page 4-21*

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following.

   ● To start the procedure, enter `p611`

   ● If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 611, TEST: 3
                 TEST A SINGLE COMMON CONTROL I/O CHANNEL


EQUIPMENT LOCATION
   2.  Module:  ▢
   3. Cabinet:  ▢
   4. Carrier:  ▢
   5.   Slot :  ▢
   6. Channel:  ▢


  7.          Alarm Status:  ▢
  8.          Circuit Type:  ▢
  9.       Location Status:  ▢
 10.         Failure Index:  ▢
 11.    Specific Fault Code: ▢
 12. Number of Times Tested: ▢
 13. Number of Times Failed: ▢




Connected to CCO ON-LINE ♡ ┌MAJOR┐┌MINOR┐┌RUN TAPE┐┌BUSY OUT┐┌IN USE┐┌WAIT┐

enter command: _
┌────────┐┌──────┐┌F3 DATA┐┌──────┐┌F5 HELP┐┌F6 FIELD┐┌F7 INPUT┐┌F8 CMDS┐
```

The switch highlights field 2.

Fields 2-6 may contain a default channel from test 1 or 2, or from Procedure 600 Test 1 or Test 2.

Field 11 may show the specific fault code for the default channel.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a 4-MHz or Dual-Speed Data Channel Continuously

1. To select a 4-MHz or dual-speed data channel choose from the following:

   - Enter cf2 and the module, cabiner, carrier, slot, and circuit in fields 2-6.

   - Enter nc until the 4-MHz or dual-speed data channel you want to test appears.

     If you select an equipment location of a processor communications circuit (PCC), special error code 81 appears on the message line.

2. Enter x to test a 4-MHz or dual-speed data channel continuously.

   Fields 2-6 show the 4-MHz or dual-speed data channel equipment location.

   Field 8 shows the circuit type (see Table 4-3).

   Field 9 shows the location status (see Table 4-4).

   Field 10 shows the number of failures.

   Field 11 shows the specific fault code. Record this number.

   Field 12 shows the number of times the switch tested the 4-MHz channel or dual-speed data channel. If the switch tests a channel more than 999 times, the count goes to 0 and starts over.

   Field 13 shows the number of times the 4-MHz or dual-speed data channel failed.

The switch updates the red and green LEDs on the 4-MHz channel or dual-speed data channel circuit pack. If the circuit pack passes, the switch turns on the circuit pack's green LED. If the circuit pack fails, the switch turns on the circuit pack's red LED. If there is an intermittent failure, the test may first pass and then fail.

The test stops if there are 99 or more failures.

3. Enters to stop the test.

   Field 10 shows which failure you are viewing.

   Field 12 shows the number of times the switch tested the 4-MHz or dual-speed data channel.

   Field 13 shows the number of times the 4-MHz or dual-speed data channel failed.

The switch lights the green LED on all 4-MHz or dual-speed data channels that pass.

4. Enter `nf` to see each failure.

>   Fields 2-6 show the equipment location of 4-MHz or dual-speed data channel.
>
>   Field 8 shows the circuit type (see Table 4-3).
>
>   Field 9 shows the location status (see Table 4-4).
>
>   Field 10 shows which failure you are viewing. The number in field 10 decreases by one as you view each failure.
>
>   Field 11 shows the specific fault code. Record this number.
>
>   Field 12 shows the number of times the switch tested the 4-MHz or dual-speed data channel.
>
>   Field 13 shows the number of times the 4-MHz or dual-speed data channel failed.

    The switch lights the red LED on any 4-MHz or dual-speed data channels that failed.

5. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 4.

    When the test passes the switch marks all common-control I/O alarms resolved. The switch turns off I/O CHANNEL on the common-control alarm panel if there is no other reason for it to be on. `MAJOR` and `MINOR` disappear from your screen if there is no other reason for them to be on.

6. If this is not the last failure, repeat steps 4-6.

    After you view all failures, the switch dashes fields 10-13. If you enter `nf` again, field 10 show the total number of failures.

7. If you want to test a different 4-MHz or dual-speed data channel repeat steps 1-7.

8. If you want to examine the common-control failure history log or resolve alarms, go to test 1.

9. If you want to select all 4-MHz and dual-speed data channels, go to test 2.

Special Error Codes

While using Procedure 611 you may see the following special error codes

●`81=Use Procedure 651 Test 2 or Test 3 to test PCC circuits.`

>   You selected an equipment location of a processor communications circuit (PCC). Use procedure 651 Test 2 or Test 3 to test PCC'S.

TABLE 4-2

Field 7 Alarm Status
0 = No errors or alarms
1 = Major
2 = Minor
3 = Warning
4 = Errors recorded
5 = Alarm resolved

TABLE 4-4

Field 9 Location Status
0 = Local
1 = Remote

TABLE 4-3

Field 8 Circuit Type
1 = 4-MHz channel
2 = Dual-speed data channel
3 = I/O buffer circuit pack

Procedure Fields

The fields listed below are data entry fields.

● In test 3 you can select an equipment location infields 2-6.

The meaning of the fields are:

2-6	EQUIPMENT LOCATION	Shows the equipment location of the common-control circuit packs, including the TN402, TN403, and TN404.
7.	Alarm Status	Shows the alarm status of the channel you pretesting. Table 4-2 shows the alarm status encodes.
8.	Circuit Type	Shows whether you are viewing a 4-MHz channel, dual-speed data channel, or an I/O buffer circuit pack. Table 4-3 shows the circuit type encodes.
9.	Location Status	Shows the physical location of the data channel.
		Remote circuits in a remote carrier group can be physically located up to 100 miles from the switch site. This field may indicate that a circuit is located in a remote carrier. A remote carrier group is not a remote module.
10.	PMIDS/DMIDS Failure Index	Shows which failure you are viewing in the PMIDS error log in test 1 when you examine a group of six failures. Shows which failure you are viewing in the demand maintenance information data structure (DMIDS) error log in tests 2 and 3 when you examine a group of six failures.
11.	Specific Fault Code	Shows the specific hardware or software component that failed. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.
12.	Number of translated I/O Channels or Number of Times Tested	In test 1, shows the number of translated input or output (I/O) channels. In test 3, shows the number of times the switch tested the circuit.
13.	Number of I/O Installed Circuit Packs or Number of Times Failed	In test 1, shows the number of input or output (I/O) circuit packs installed. In test 3, shows the number of times the data channel failed (up to 99).

PROCEDURE 612 - INITIALIZATION CAUSES

Purpose

Use Procedure 612 to find why the switch initialed the common control, to resolve alarms, to clear the state-of-health registers in the PMIDS error log, and to delete all failure history from the PMIDS error log.

Tests

Procedure 612 has one test.

- Use test 1 to find why the switch initialized the common control, to resolve alarms, to clear the state-of-health register, and to delete all entries from the PMIDS error log.

Procedure Overview

If the switch hardware finds a problem during a periodic maintenance test, it will try to initialize the common control processor. In a duplicated system, the switch may also try to switch from the on-line common-control processor to the off-line common-control processor. Use Procedure 612 to find why the switch interrupted operations and initialized the common control or switched between common control processors.

You can use Procedure 612 to clear the state-of-health registers (the registers that contains records of soft A or soft B switchovers).

You can also use procedure 612 to delete all maintenance failure history from the PMIDS error log. Deleting all history from the PMIDS error log, though, is not a normal maintenance function. If you delete all entries from the PMIDS error log, you remove all failure indications and all switch failure history.
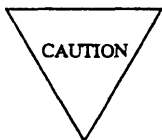
⚠ CAUTION   Deleting alarms is not a good practice and not a normal maintenance function.

Use the following flowcharts to direct you from test to test. You may want to remove them during the test and refer to them as you use this procedure.

Figure 4-3. To Examine Initialization Causes

Figure 4-4. To Delete All Maintenance History from the PMIDS Error Log

Test 1 - Operation

Use test 1 to find why   the switch software initialized the common control or switched between processors, to resolve alarms, to clear the state-of-health registers, and to delete all failure history from the PMIDS. error log.
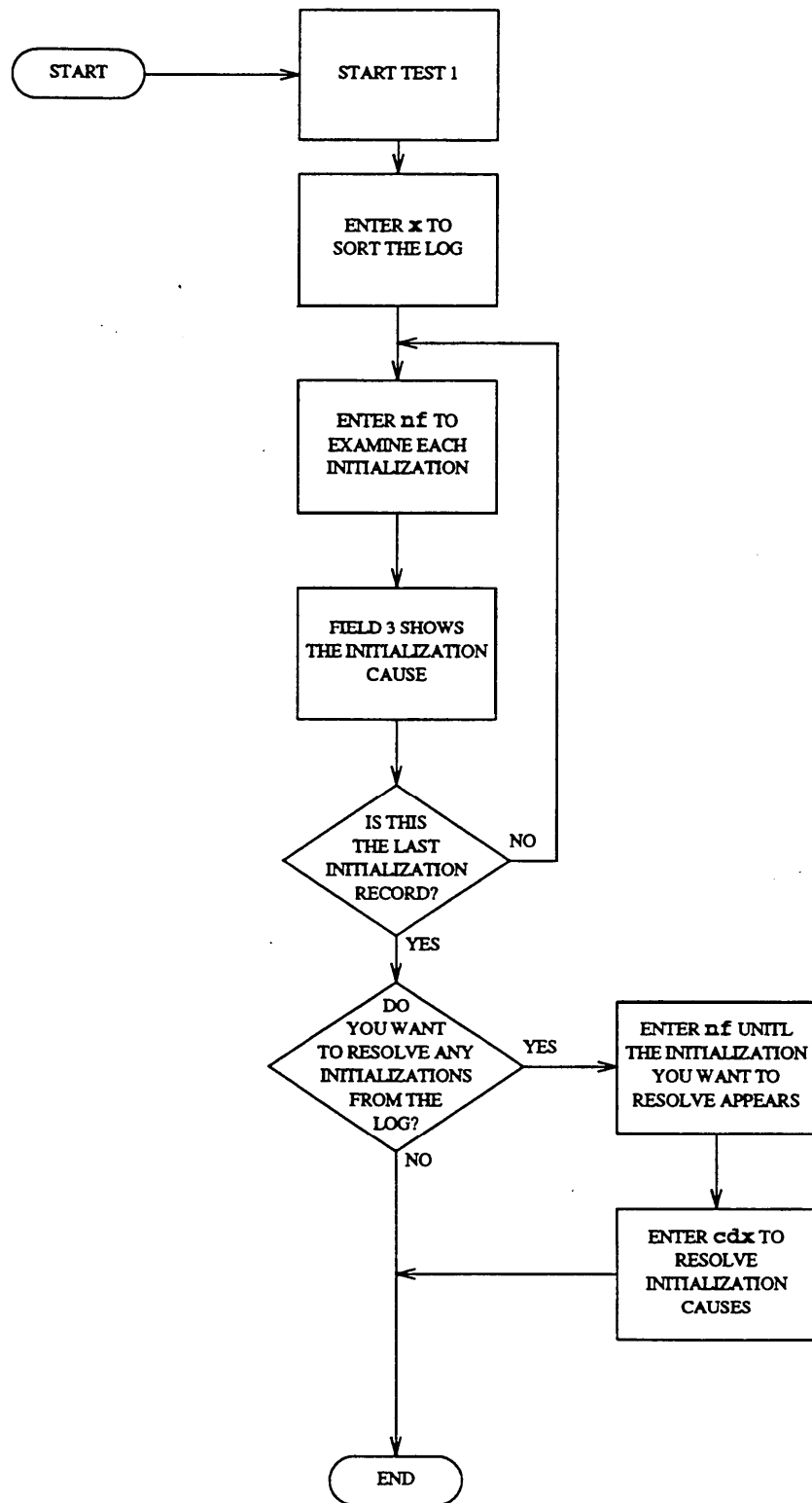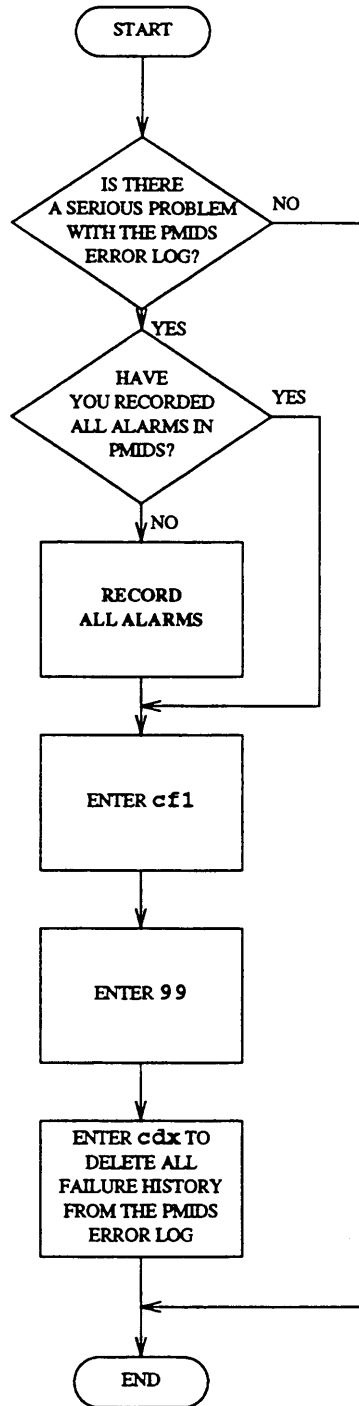
In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, enter p612

    The test 1 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────────┐
│                ENHANCED MODE - PROCEDURE: 612, TEST: 1            │
│                    EXAMINE  INITIALIZATION  CAUSES                │
│                                                                   │
│  1.  Initialization Cause Index: ▢                                │
│  2.                   Unit Type: ▢                                │
│  3.         Initialization Cause: ▢                               │
│                                                                   │
│ MEMORY ADDRESS                                                    │
│    4. Memory Block Location: ▢                                    │
│    5.         Octal  Address: ▢                                   │
│                                                                   │
│ TIME  STAMP                                                       │
│    6.    Day: ▢                                                   │
│    7.   Hour : ▢                                                  │
│    8. Minute : ▢                                                  │
│                                                                   │
│  9.   Count to Reload: ▢                                          │
│ 10. Processor Health: ▢                                           │
│                                                                   │
│                                                                   │
│ Connected to CCO ON-LINE ♥ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │ │
│─────────────────────────────────────────────────────────────────│
│ enter command: ▱                                                 │
│ _____ │ ____ ││ F3 DATA │ │ ____ ││ F5 HELP ││ F6 FIELD ││ F7 INPUT ││ F8 CMDS │ │
└─────────────────────────────────────────────────────────────────┘
```

    To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

### To Find Why the Common Control Was Initialized

1. Enter `x` to sort the common-control initialization history log.

   The switch sorts the log by initialization time and date. The most recent initialization appears first.

   > Field 1 contains a 0.

   > Field 10 shows the processor health. If the processor is healthy, field 10 contains a 0.

2. Enter `nf` to see the initialization specific fault code.

   > Field 1 shows the initialization fault number.

   > Field 2 shows the unit type (see Table 4-5).

   > Field 3 shows the initialization cause (see Table 4-7).

   > Field 4 may show the octal address of the memory block location that failed.

   > Field 5 may show the octal address in the memory block. Note that some initialization causes do not show memory block location or octal address in fields 4 and 5.

   > Fields 6-8 shows when the common control was initialized.

   > Field 9 shows the number of times the processor can be initialized before it will reload.

   > Field 10 shows the processor health (see Table 4-6).

3. If there was an initialization, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 3.

4. If there are more initialization cause codes, repeat steps 2-4.

   After you view all initialization cause codes, the switch dashes fields 3-10. If you enter `nf` again, the first initialization cause code appears.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to delete all failure information from the PMIDS error log, go to *To Delete All Maintenance Data.*

To Resolve All Alarms

You may want to resolve any invalid initialization entries from the initialization history log.

1. Make sure field 10 shows the processor health.

    If field 10 does not show the processor health, enter x
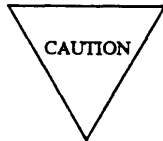
     Record all initialization entries before you resolve them from the common-control failure history log. Then you will have a history you can use for future troubleshooting.

2. Enter cdx to resolve all initialization entries.

    Field 10 contains a 0 (see Table 4-6).

    The switch marks all initialization entries resolved. The switch turns off OTHER FAILS, MEM or CACHE on the common-control alarm panel if there is no other reason for them to be on.

3. If you want to see why the common control was initialized, go to *To Find Why the Common Control Was Initialized.*

4. If you want to delete all failure history from the PMIDS error log, go to *To Delete All Maintenance Data.*

5. If you want to clear the state-of-health registers, go to *To Clear the State-of-Health Registers.*

To Delete All Maintenance Data
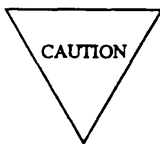
 Clearing all maintenance data from the PMIDS error log is not a normal maintenance function. Record and investigate each entry before you delete all maintenance data from the PMIDS error log. If you delete all maintenance data, all switch history information will be lost.

1. Enter cfl so you can enter data in field 1.

    The switch highlights field 1.

2. Enter 99 in field 1.

    If you enter a number other than 99 (except for 44), error code 3 appears on the message line.

3. Enter cdx to delete all maintenance data from the PMIDS error log.

    WAIT appears on your screen.

    Field 10 contains a 0 (see Table 4-6).

    The switch removes all maintenance data from the PMIDS error log. The switch dashes fields 1-9. The switch turns off all common-control alarm indicators. MAJOR and MINOR disappear from your screen.

4. If you want to resolve alarms, go to *To Resolve All Alarms.*

5. If you want to see why the common control was initialized, go to *To Find Why the Common Control Was Initialized*

To Clear the State-of-Health Status Registers

CAUTION
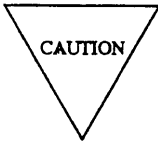
Clearing soft A or soft B switches from the PMIDS error log is not a normal maintenance function. Record and investigate each switchover record before you delete all soft A or soft Bs from the PMIDS error log. If you clear this switch history information, it will be lost.

1. Enter `cfl` so you can enter data in field 1.

   The switch highlights field 1.

2. Enter 44 infield 1.

3. Enter `cdx` to clear all soft As or soft Bs from the PMIDS error log.

   `WAIT` appears on your screen.

   The switch removes all soft As or soft Bs from the PMIDS error log.

4. If you want to resolve alarms, go to *To Resolve All Alarms.*

5. If you want to see why the common control was initialized, go to *To Find Why the Common Control was Initialized*

TABLE 4-5

Field 2 Unit Type		
3	=	Initialization
5	=	Main memory
18	=	Cache memory

TABLE 4-6

Field 10 Processor Health		
0	=	No failure, passes
1	=	Minor failure (soft A)
2	=	Major failure (soft B)
3	=	Hardware failure

TABLE 4-7

Field 3 Initialization Cause		
1 = Short power fail	15 = Cache parity low byte	30 = Duplication memory match
2 = Micro memory parity	16 = Cache parity high byte	31 = Parity audit
3 = Sanity time out	17 = Cache parity low and high byte	32 = XRAY processor
4 = I/O sanity time out	18 = 501CC diagnostic register	33 = XRAY memory
5 = Memory parity low byte	19 = Recovery from suicide	34 = Microdiagnostic
6 = Memory parity high byte	20 = Hold/get overflow	35 = Processor soft switch
7 = Memory parity low and high byte	21 = Long power fail	36 = Halt/go
8 = Illegal operation code	22 = Microdiagnostic 15	37 = Cache recovery
9 = Fetch abort	23 = Hold/get area	38 = Memory recovery
10 = Write protect	24 = Branch to zero	39 = Emergency transfer
11 = Illegal micro instruction	25 = Interrupt area	40 = Network test controller
12 = Bus time out	26 = False ID	41 = Duplication channel is bad
13 = Duplication channel receive	27 = Both processors on line	42 = I/O
14 = Duplication illegal instruction	28 = Processor suicide	43 = Processor hard switch
	29 = Five short initializations	

Procedure Fields

The fields listed below are data entry fields.

● You can enter a 99 in field 1 to delete all switch history data from the log or a 44 in field 1 to clear the state of health register

The meaning of the fields are:

1.	Initialization Cause Index	Shows an index to processor initializations. The most recent causes have the lowest index. When the index is 0, field 10 shows the processor health. This field also has two special encodes (44 or 99) that you can only enter with the change field sequence. Use encode 44 to clear all health and status information from the PMIDS error log. Use encode 99 to delete all entries from the PMIDS error log.
2.	Unit Type	Shows the unit type of the initialization cause in field 1. Table 4-5 lists the unit type encodes.
3.	Initialization Cause	Shows why the hardware area in field 2 failed. The three types of hardware failures are initialization, main memory, or cache memory. If there is a main memory failure, the failing memory block and memory address appear in fields 4 and 5. Table 4-7 lists the initialization cause codes.
4.	Memory Block Location	Shows the memory block size of the fault if there was a main memory failure. One memory block contains 256 K bytes.
5.	Octal Address	Shows the octal address of the memory block in field 4 (if there was a main memory failure) that was logged when the initializaiton occurred.
6-8.	TIME STAMP	Shows the day, hour, and minute the initialization first occurred in the switch.
9.	Count to Reload	Shows the seriousness of the initialization cause that led to a reload of memory. If the processor initializes within two minutes of a previous initializaiton, the number in this field increases by one. There are five levels of severity, with 1 being the least severe. If field 9 contains a 5 the switch will reload if another initialization takes place within two minutes of the last initialization.
10.	Processor Health	Shows the health of the processor. Table 4-6 shows the processor health encodes. Note that encodes 1 to 3 only apply to duplicated systems.

PROCEDURE 613 - DUPLICATE PROCESSOR CONTROL AND TESTS

Purpose

Use Procedure 613 to see why a switch with a duplicate common-control processor has switched between common controls, to test the duplication channel, and to switch to the off-line processor.

Tests

Procedure 613 has three tests.

- Use test 1 to see duplicate processor common-control failure history and to resolve alarms.
- Use test 2 to see the status of the on-line and off-line processor and to test the duplication channel.
- Use test 3 to find the status of both processors and to soft switch between processors.

Procedure Overview

There may be two common controls in a switch to support high reliability or critical reliability installations. If one common-control processor fails, the other processor switches on-line and takes over all call processing in the switch.

There are two types of common-control processor switches, a soft switch and a hard switch. Use Procedure 613 to do a soft switch. In a soft switch the on-line status information is transferred to the off-line common-control processor. Use the common-control alarm panel to do a hard switch between the two common-control processors. A hard switch may interrupt service momentarily. Transient calls (for example, calls in the dialing state) and some data calls may be dropped. In a hard switch the on-line common control status is not transferred to the off-line common-control processor.

If a common-control processor switch attempt fails, the switch logs the failure in the PMIDS error log in both the on-line and the off-line processor. Use Procedure 613 to find why the attempt failed.

It is a good practice to periodically check the status of the on-line processor, the off-line processor, and the duplication processor channel to ensure that a hard or soft switch could take place, if one is required

Use the following flowcharts to guide you from test to test. You may want to remove them during the test.
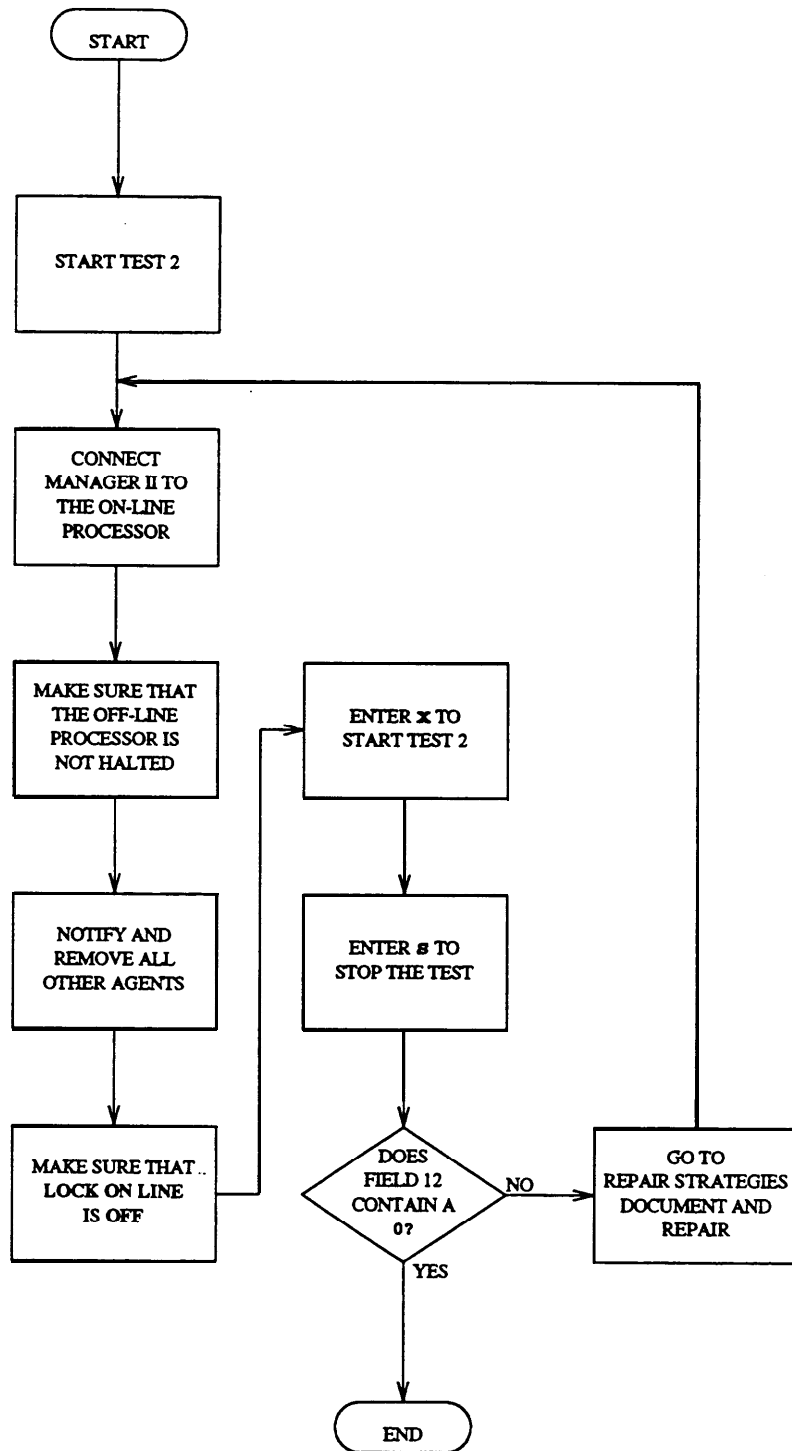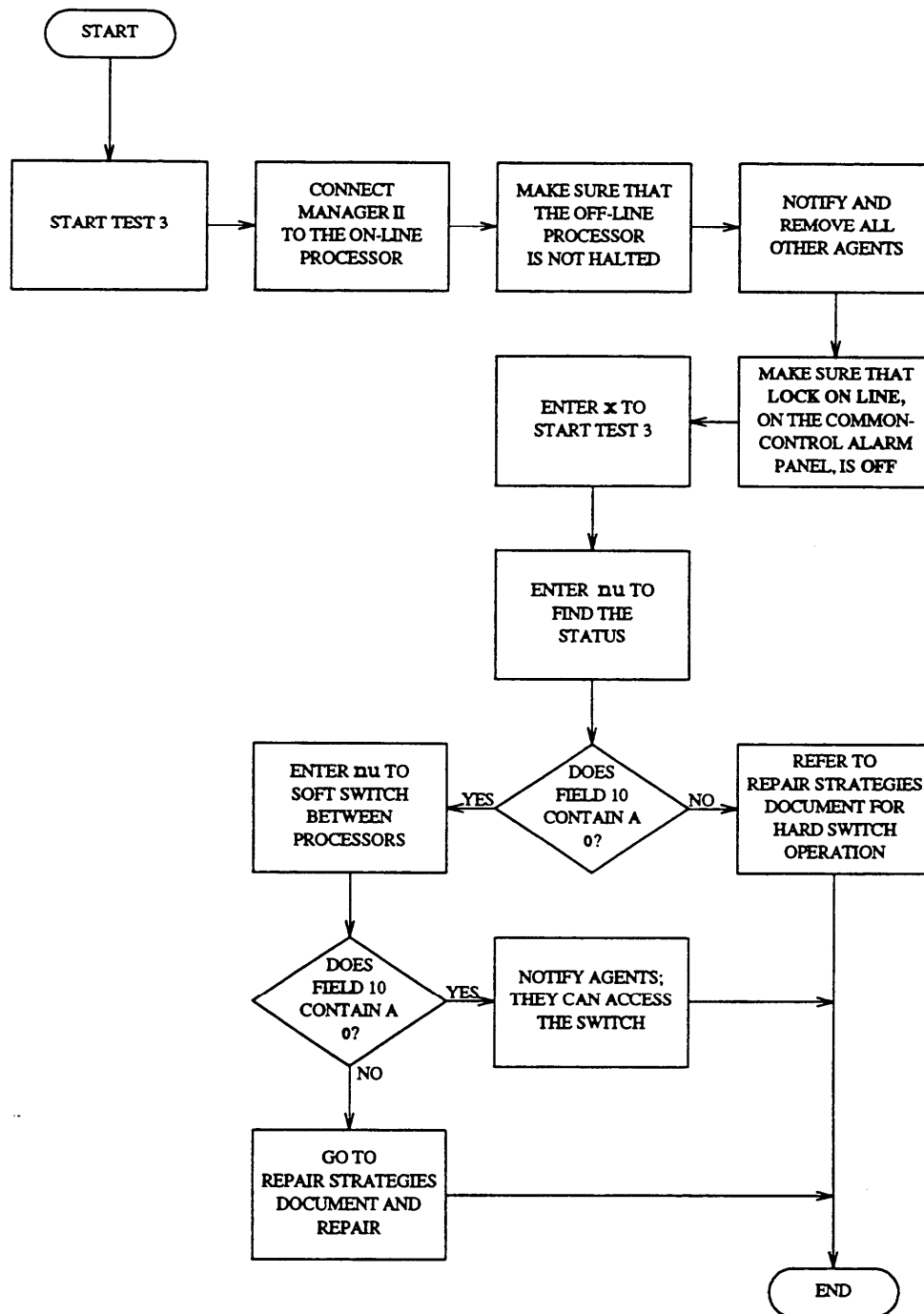
Figure 4-5. To Test the Duplication Channel

Figure 4-6. To Switch from the On-Line to the Off-Line Processor

Test 1 - Operation

Use test 1 to see the duplicate processor control failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter `t1`

   - Otherwise, enter `p613`

     If the switch does not have a duplicate processor, special error code 74 appears.

   The test 1 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│              ENHANCED MODE - PROCEDURE: 613, TEST: 1          │
│          EXAMINE THE DUPLICATE PROCESSOR CONTROL FAILURE HISTORY LOG │
│                                                               │
│    2.          Processor Status: ▢                            │
│    9.             Alarm Status: ▢                             │
│   11.            Failure Index: ▢                             │
│   12.      Specific Fault Code: ▢                             │
│   13. Number of Times Failed: ▢                               │
│                                                               │
│   TIME STAMP                                                  │
│     14.   Index: ▢                                            │
│     15.     Day: ▢                                            │
│     16.    Hour: ▢                                            │
│     17. Minute: ▢                                             │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│  Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │ │
│                                                               │
│  enter command: ▬                                            │
│  ┌──────┐┌─────┐┌F3 DATA┐┌─────┐┌F5 HELP┐┌F6 FIELD┐┌F7 INPUT┐┌F8 CMDS┐ │
└─────────────────────────────────────────────────────────────┘
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Duplicate Processor Failure History Log

1. Enter x to sort the duplicate processor failure history log.

   The switch sorts alarms by priority. Major alarms appear first. Errors appear next.

   Field 10 shows the number of failures. If there are no failures, field 10 contains a 0.

2. Enter nf to see each failure.

   Field 2 shows the processor status (see Table 4-8).

   Field 9 shows the alarm status (see Table 4-12).

   Field 11 shows the number of failures (up to six), including the failure on your screen. The number in field 11 decreases by one as you view each failure.

   Field 12 shows the specific fault code. Record this number.

   Field 13 shows the number of times the switch recorded the specific fault code.

   Field 14 shows the time stamp index (see Table 4-14).

   Fields 15-17 show when the error was last recorded or when the error became an alarm.

3. If you want to see other time stamps, choose from the following:

   - To see when the error was last recorded in the switch, enter nd until field 14 contains a 1.

     Fields 15-17 show when the alarm was last recorded.

   - To see when the error first appeared in the switch, enter nd until field 14 contains a 2.

     Fields 15-17 show when the alarm first appeared in the switch.

   - To see when the error became an alarm, enter nd until field 14 contains a 3.

     Fields 15-17 show when the error became an alarm.

4. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 22.

5. If this is not the last failure, repeat steps 2-5.

   After you view all failures, the switch dashes fields 2-17. If you enter nf again, field 11 shows the number of failures.

6. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

7. If you want to test the duplication channel, go to test 2.

8. If you want to soft switch between processors, go to test 3.

To Resolve Alarms

You may have to resolve any invalid alarms from the duplicate processor failure history log.

1. If you want to resolve all alarms, make sure that field 11 shows the total number of alarms.

    If field 10 does not show all alarms, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nd until the alarm you want to resolve appears.
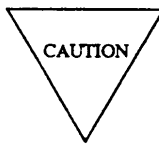
CAUTION   Record all alarms, and their time stamps, before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

    Field 9 contains a 5 if you resolved a single alarm (see Table 4-12).

    Field 10 shows the number of alarms. If you resolved all alarms, field 10 contains a 0.

    The switch marks duplicate processor alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on. MAJOR disappears from your screen if there is no other reason for it to be on.

4. If you want to test the duplication channel, go to test 2.

5. If you want to soft switch between processors, go to test 3.

Test 2 - Operation

Use test 2 to see the status of the on-line and off-line processor and to test the duplication channel.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following.

   • To start the procedure, enter `p613`

     If the switch does not have a duplicate processor, special error code 74 appears.

   • If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────────────┐
│                 ENHANCED MODE - PROCEDURE: 613, TEST: 2               │
│            EXAMINE THE HEALTH AND STATUS OF THE DUPLICATE PROCESSOR CONTROL │
│                                                                       │
│    2. Processor Status: □                                             │
│                                                                       │
│  ON-LINE PROCESSOR HEALTH CODE                                        │
│      3. Hardware: □                                                   │
│      4.   Soft B: □                                                   │
│      5.   Soft A: □                                                   │
│                                                                       │
│  OFF-LINE PROCESSOR HEALTH CODE                                       │
│      6. Hardware: □                                                   │
│      7.   Soft B: □                                                   │
│      8.   Soft A: □                                                   │
│                                                                       │
│  12. Failure Code: [     ]                                            │
│                                                                       │
│                                                                       │
│                                                                       │
│  Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ] │
│                                                                       │
│  enter command: ▄                                                     │
│  [    ][    ][F3 DATA ][    ][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS]  │
└─────────────────────────────────────────────────────────────────────┘
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Duplication Channel

1. Make sure that Manager II is connected to the on-line processor.

    `Connected to CC0` appears on your screen when you are connected to `CC0`. `Connected to CC1` appears on your screen when you are connected to CC1.

2. Make sure that the off-line processor is not halted.

3. Make sure that no one is running maintenance or administration procedures in the off-line processor.
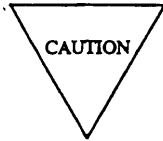
    If other agents are accessing the switch, the switch may block the transfer of data into the off-line processor's memory buffer and the off-line processor may reload.

    If you suspect that other agents maybe accessing the switch, enter the mode procedure and check the status.

4. Make sure that **LOCK ON LINE,** on the common-control alarm panel, is set to **OFF.**

5. Enter x to test the duplication channel.

    Field 2 shows the processor status (see Table 4-8).

    Fields 3-8 shows the health codes of both processors (see Tables 4-9 to 4-1 1).

    Field 12 shows the failure code (see Table 4-15).

6. After a few minutes enters to stop the test.

    Field 12 contains a `0` if the test passed. If field 12 contains any other number, the test failed.

7. If field 12 contains a 99, wait until the off-line processor completes reloading and then repeat steps 2-7.

8. If the test failed, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 22.

    When the test passes the switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on. `MAJOR` disappears from your screen if there is no other reason for it to be on.

9. If you want to examine the duplicate processor failure history log, go to test 1.

10. If you want to check the health code of either processor, update the memory, or switch between processors, go to test 3.

Test 3 - Operation

Use test 3 to find the status of both processors and to soft switch between processors.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following.

   - To start the procedure, enter `p613`

      If the switch does not have a duplicate processor, special error code 74 appears.

   - If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────┐
│              ENHANCED MODE - PROCEDURE: 613, TEST: 3               │
│                     DUPLICATE  PROCESSOR  CONTROL                  │
│                                                                    │
│   2. Processor Status: ▢                                           │
│                                                                    │
│ ON- LINE PROCESSOR HEALTH CODE                                     │
│    3. Hardware: ▢                                                  │
│    4.    Soft B: ▢                                                 │
│    5.    Soft A: ▢                                                 │
│                                                                    │
│ OFF-LINE PROCESSOR HEALTH CODE                                     │
│    6. Hardware: ▢                                                  │
│    7.    Soft B: ▢                                                 │
│    8.    Soft A: ▢                                                 │
│                                                                    │
│ 10. Switch Status: ▢                                              │
│ 12.   Failure Code: ▢                                            │
│                                                                    │
│                                                                    │
│ Connected to CC0 ON-LINE ♡ │MAJOR││MINOR││RUN TAPE││BUSY OUT││IN USE││WAIT│ │
│                                                                    │
│ enter command: ▬                                                  │
│ │     ││     ││F3 DATA││     ││F5 HELP││F6 FIELD││F7 INPUT││F8 CMDS│ │
└──────────────────────────────────────────────────────────────────┘
```

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Soft Switch Between Processors

1. Make sure that MANAGER II is connected to the on-line processor.

   `Connected to CCO appears` on your screen when you are connected to CC0. `Connected to CC1` appears on your screen when you are connected to CC1.

2. Make sure that the off-line processor is not halted.

3. Make sure that no one is running maintenance or administration procedures in the off-line processor.
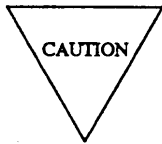
   ⚠ CAUTION   If other agents are accessing the switch, the switch may block the transfer of data into the off-line processor's memory buffer and the off-line processor may reload.

   If you suspect that other agents maybe accessing the switch, enter the mode procedure and check the status.

4. Make sure that **LOCK ON LINE,** on the common-control alarm panel, is set to **OFF.**

5. Enter x to start the test.

6. Enter nu to find the on-line processor status.

   Field 2 shows the processor status (see Table 4-8).

   Fields 3-8 show the health code of both processors (see Tables 4-9 to 4-11).

   Field 10 shows the processor switch status (see Table 4-13). If Field 10 contains a 0 you can switch processors. If field 10 contains a 1 you can only do a hard switch.

   Field 12 shows the failure code (see Table 4-15).

7. Enter nu again to switch between processors.

   WAIT appears on your screen.

   If you are not connected to the on-line processor, special error code 09 appears in the message line.

   If the off-line processor is not healthy or if you have not cleared other agents from the switch, special error code 80 appears in the message line.

When the off-line processor is switched on line WAIT disappears. **PASS,** on the common-control alarm panel, and the heartbeat on your screen for the off-line common control do not change state until the status memory is transferred. If the heartbeat LED was lit, it stays lit. If it was off, it stays off.

Field 2 contains a 1 if the transfer is successful (see Table 4-8).

Field 10 contains a 0 (see Table 4-13).

PASS, on the common-control alarm panel, flashes for both common controls. CONNECTED TO CC0 or CONNECTED TO CC1 shows you which processor is on-line. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

If the switch attempt failed, field 12 shows the failure code. Special error code 95 appears in the message line.

8. If the test failed, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 22.

    If the switch attempt failed, the off-line processor usually reloads. After the off-line processor has reloaded (because of a soft switch failure), use test 2 to check the status of the duplication channel.

9. Notify any other switch users that they can access the switch again.

10. If you want to examine the duplicate processor failure history log, go to test 1.

11. If you want to test the duplication channel, go to test 2.

Special Error Codes

While using Procedure 613 you may see the following special error codes.

- 80=Illegal switch attempt.

    You tried to switch between two common control processors before you disabled other agents from accessing the switch. Disable other agents, using the mode procedure, and try again. If this error code appears again go to *DEFINTIY Communications System Generic 2 Maintenance Repair Strategies* (555-l04-118) and repair.

- 81=The off-line DCIU is not initialized.

    You tried to switch processors but the off-line DCIU was not initialize. Use Procedure 650 in the off-line side to initialize the off-line DCIU and try again.

- 82=A memory mismatch exists between common-controls. A memory mismatch has been detected. Resolve memory mismatches in Procedure 614 before switching processors.

- 83=A memory mismatch may exist between common-controls. A memory double-write failure occurred, and a memory mismatch may exist. The memory periodic test is in the process of verifying the mismatch. If it is a real mismatch, an error code 75 will be raised. Run Procedure 614 to ensure no mismatches are present. The double-write failure is not an indication that there is a definite hardware problem.

TABLE 4-8

Field 2 Processor Status		
0	=	Off-line
1	=	On-line

TABLE 4-9

Field 3 Hardware		
0	=	Healthy
1	=	Unhealthy

TABLE 4-10

Field 4 Soft B		
0	=	Healthy
1	=	Major software problem

TABLE 4-11

Field 5 Soft A		
0	=	Healthy
1	=	Minor software problems

TABLE 4-12

Field 9 Alarm Status		
0	=	No alarms or errors
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarm resolved

TABLE 4-13

Field 10 Switch Status		
0	=	Switch permitted
1	=	Switch not permitted

TABLE 4-14

Field 14 Index		
1	=	Latest failure
2	=	First error
3	=	Failure alarmed

Procedure Fields

The meaning of the fields are:

2.	Processor Status	Contains a 0 if the processor is off-line or a 1 if the processor is on-line. Table 4-8 lists the processor status encodes.
3&6.	Hardware	Contains a 0 if the hardware is healthy or a 1 if there is a major software problem. Table 4-9 lists the hardware status encodes.
4&7.	Soft B	Contains a 0 if the common control is healthy or a 1 if the switch has a major software problem. Table 4-10 lists the soft B status encodes.
5&8.	Soft A	Contains a 0 if the common control is healthy or a 1 if the switch has a minor software problem or temporary problem (for example the off-line side is reloading). Table 4-11 lists the soft A status encodes.
9.	Alarm Status	Shows the alarm severity. Table 4-12 shows the alarm status encodes.
10.	Switch Status	Shows whether a switch between two common-control processors is permitted. Table 4-13 shows the switch status encodes.
11.	Failure Index	At first the total number of failures appears. As you view each failure, field 11 shows which failure you are viewing.
12.	Specific Fault Code or Failure Code	In test 1 this field shows the specific fault code. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems. In test 2 and 3 this field shows the failure code. Table 4-15 lists the failure code encodes.
13.	Number of Times Failed	Shows the number of times the circuit failed.
14-17.	TIME STAMP	When field 14 contains a 1, fields 15-17 show when the alarm was last recorded. When field 14 contains a 2, fields 15-17 show when the error first appeared in the switch. When field 14 contains a 3, fields 15-17 show when the error became an alarm.

TABLE 4-15

Field 12 Failure Code			
0 = No failures		41 = Block transfer CF=0 after duplicate memory block (DBLK)	
1 = Processor inconsistency		42 = Cannot read CF=0 after RWD	
11 = Double write flip flop cannot be cleared (CDBL fails)		43 = Data mismatched	
12 = Double write flip flop cannot be set (SDBL fails)		44 = Duplication status register flags could not be cleared	
21 = Memory update flip flop CF=0 After CMU		45 = Duplication errors occurred during block transfer	
22 = Memory update flip flop cannot cleared (CM-U fails)		46 = Duplication errors occurred during block transfer verification	
23 = Memory update flip flop CF=0 After SMU		51 = ID chip test failed	
24 = Memory update flip flop cannot be set (SMU fails)		61 = Parity checker/generator failed good parity test	
31 = Read double word CF=0 on RWD of data x(5555)		62 = Parity checker/generator failed bad parity low byte test	
32 = Read double word CF=0 on RWD of data X(AAAA)		63 = Parity checker/generator failed bad parity high byte test	
33 = Read double word CF=0 on RWD of data X(FFFF)		95 = Switch attempt failed	
34 = Read double word CF=0 on RWD of data X(0000)		96 = Off-line DCIU not initialized	
35 = Read double word data does not match X(5555)		97 = Unresolved duplication failure	
36 = Read double word data does not match X(AAAA)		98 = Duplication status register failure	
37 = Read double word data does not match X(FFFF)		99 = Off-line processor reload in process or reloading	
38 = Read double word data does not match X(0000)			

PROCEDURE 614 - MAIN AND CACHE MEMORY TESTS

Purpose

Use Procedure 614 to examine memory failures, to resolve alarms, and to test the main and cache memory.

Tests

Procedure 614 has six tests.

- Use test 1 to see main memory or cache superset failure history log and to resolve alarms.

- Use test 2 to find the state of health of the main and cache memory.

- Use test 3 to test all memory locations.

- Use test 4 to test a specified range of memory continuously.

- Use test 5 to read the contents of any memory location or any range of memory locations.

- Use test 6 to test the cache supersets continuously.

Procedure Overview

The DEFINITY Generic 2 contains 16M of main memory (TN394) and an optional cache memory (TN369 or TN379). The memory size will depend on the switch software requirements.

The switch periodically compares the on-line memory to the off-line memory (in a duplicated common control switch), and does a double write and read test to test all memory. Memory errors may also be detected by the run tape program. If these tests fail, the switch lights **MEM** or **CACHE MEM** on the common-control alarm panel. A memory alarm is logged in PMIDS.

Use Procedure 614 if there is main or cache memory failure. Use test 1 to examine the main memory or cache memory failure history log or to resolve memory alarms. Use tests 2, 3, 4, and 6 to test the main memory circuit packs, the processor memory interface, and the cache memory circuit pack. Use test 5 to read the contents of any memory location.

Test 1 - Operation

Use test 1 to examine the main or cache memory failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen choose from the following:

   ● If you are already in the procedure, but not in test 1, enter `t1`

   ● Otherwise, enter `p614`

   The test 1 screen, similar to the following, appears.

```
                  ENHANCED MODE - PROCEDURE: 614, TEST: 1
                     EXAMINE THE MEMORY FAILURE HISTORY LOG

MEMORY LOCATIONS
   2.                      Memory  Block:  ☐
   3. Cache Superset or Memory Address:  ☐

 8. Failure Data: ☐








Connected to CC0 ON-LINE ♡ ┌ MAJOR ┐┌ MINOR ┐┌ RUN TAPE ┐┌ BUSY OUT ┐┌ IN USE ┐┌ WAIT ┐

enter command: ▭
┌────────┐┌────────┐┌ F3 DATA ┐┌────────┐┌ F5 HELP ┐┌ F6 FIELD ┐┌ F7 INPUT ┐┌ F8 CMDS ┐
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Memory Failure History Log

1. Enter x to sort the memory failure history log.

   WAIT appears on your screen as the switch sorts memory alarms by alarm priority.

   When the test is done WAIT disappears from your screen.

   > Field 8 shows the type of memory failures (see Table 4-18). If there are no memory failures, field 8 contains a 0.

2. Enter nc to see each alarm.

   > Field 2 shows the memory block.

   > Field 3 shows the cache superset or memory address.

   > Field 8 shows which failure you are viewing. The number in field 8 decreases by one as you view each alarm.

3. If there is a failure, go to test 2 and test the memory.

4. If there are more alarms in the memory failure history log repeat steps 2-4.

   After you view all alarms, the switch dashes fields 2-8. If you enter nc again, field 8 shows the total number of failures.

5. If you want to find the state of health of the main and cache memory, go to test 2.

6. If you want to test a range of memory, go to test 3.

7. If you want to test memory continuously, go to test 4.

8. If you want to examine memory contents, go to test 5.

9. If you want to test cache supersets, go to test 6.

To Resolve Alarms

You may want to resolve any invalid alarms from the main or cache memory failure history log.

1. If you want to resolve all alarms, make sure that the summary is on your screen.

   If the summary is not on your screen, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter nf until the alarm you want to resolve appears.
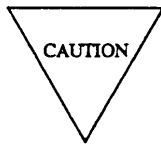
   CAUTION   Record all main or cache memory failures before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

   The switch marks memory alarms resolved. The switch turns off **MEM** and **CACHE MEMORY** indicators on the common-control alarm panel if there is no other reason for them to be on.   MAJOR disappears from your screen if there is no other reason for it to be on.

4. If you want to find the state of health of the main and cache memory, go to test 2.

5. If you want to test a range of memory, go to test 3.

6. If you want to test memory continuously, go to test 4.

7. If you want to examine memory contents, go to test 5.

8.   If you want to test cache supersets, go to test 6.

Test 2 - Operation

Use test 2 to find the state of health of the main and cache memory.

In test 2 you can:

View the test 2 screen	*page 4-55*
Find the health of the main and cache memory	*page 4-56*

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure enter p614

   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────────────┐
│              ENHANCED MODE - PROCEDURE: 614, TEST: 2                   │
│           EXAMINE HEALTH AND STATUS OF MAIN AND CACHE MEMORY           │
│                                                                       │
│ MEMORY LOCATIONS                                                      │
│    2.              First Memory Block: ▯                              │
│    3. Cache Superset or Memory Address: ▭                            │
│    4.               Last Memory Block: ▯                              │
│                                                                       │
│    6.              Failed Words: ▭                                    │
│    7.          Failure Location: ▯                                    │
│    8. Number of Failed Blocks: ▯                                      │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│ Connected to CC0 ON-LINE ♡  MAJOR   MINOR   RUN TAPE   BUSY OUT   IN USE   WAIT │
│                                                                       │
│ enter command: ▭                                                     │
│         F3 DATA         F5 HELP  F6 FIELD  F7 INPUT  F8 CMDS          │
└─────────────────────────────────────────────────────────────────────┘
```

   Fields 2 and 3 show the first block and address in memory and contain a 0.

   Field 4 shows the last memory block in the switch.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Find the Health of the Main and Cache Memory

1. Enter x to find the health of the main or cache memory.

   WAIT appears on your screen.

   The switch does an ID chip and parity check and then tests all main memory. In a switch with a duplicated common control, the test searches for differences between the two processor memories.

   It takes about five minutes to test each block of 256K words. You can compute the total test time by multiplying the number of 256K blocks of switch memory by five minutes. In DEFINITY Generic 2 it takes about 80 minutes to test 16M.

   The following fields change as the switch tests the memory.

   > Field 2 shows the memory block tested. The switch updates field 2 about every five minutes.

   > Field 3 shows the main memory block address tested. The switch updates field 3 about every second.

   > Field 6 shows the number of failed words. The switch updates field 6 if there are any failures.

   > Field 7 shows the area of memory where the failures occurred, including program, patch, translation other, or a combination of these (see Table 4-17). The switch updates field 7 every second if there are failures.

   > Field 8 shows the number of blocks that failed. The switch updates field 8 every second.

   If you want to stop the test before all memory is tested, enter s

   > Fields 2 and 3 show the last tested memory block and memory address.

   > Field 4 shows the last testable memory block in the switch configuration.

   > Field 6 shows the number of failed words.

   > Field 8 shows the number of failed blocks.

   If you want to continue the test, enter x

When all main memory is tested `WAIT` disappears from your screen.

If there are no failures, fields 6 and 8 contain a `0`. The switch turns off **MEM** or **CACHE MEMORY** on the common-control alarm panel.

If the switch finds any memory failures, the following appears.

> Fields 2 and 3 show the last memory location that was tested.
>
> Field 4 shows the last memory block that was tested (equal to last memory block in the switch configuration).
>
> Field 6 shows the number of failed words.
>
> Field 7 shows the area of memory where the failure occurred (see Table 4-17).
>
> Field 8 shows the number of failed blocks.

If the switch is not duplicated, special error code 74 may appear.

2. If there are any main or cache memory failures, go to *DEFINITY*™ *Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 5 for main memory failures or unit type 18 for cache memory failures.

3. If you want to examine memory failures, go to test 1.

4. If you want to test a range of memory, go to test 3.

5. If you want to test memory continuously, go to test 4.

6. If you want to examine memory contents, go to test 5.

7. If you want to test cache supersets, go to test 6.

Test 3 - Operation

Use test 3 to test a range of memory locations.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter `p614`
   - If you are already in the procedure, but not in test 3, enter `t3`

     The test 3 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────────────────┐
│              ENHANCED MODE - PROCEDURE: 614, TEST: 3                       │
│                  MEMORY READ AND MEMORY MATCH TEST                         │
│                                                                           │
│ MEMORY LOCATIONS                                                          │
│    2.               First Memory Block: [--]                              │
│    3. Cache Superset or Memory Address: [------]                          │
│    4.                Last Memory Block: [--]                              │
│                                                                           │
│  5.    Common Control: [-]                                                │
│  6. Contents of First Memory Location: [--------]                         │
│  7. Failure Location: [--]                                                │
│  8.    Failed Blocks: [--]                                                │
│                                                                           │
│                                      ..                                   │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│ Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ] │
│ ───────────────────────────────────────────────────────────────────────  │
│ enter command: _                                                          │
│ [        ][      ][ F3 DATA ][    ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ] │
└─────────────────────────────────────────────────────────────────────────┘
```

The switch highlights field *2.*

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Range of Memory

1. To select a starting memory block and memory location, enter `cf2` and enter the starting memory block and the memory location.

   If the specific memory block and memory location are not in testable memory, special error code 80 appears in the message line.

2. Enter `x` to test the memory location you selected.

   `WAIT` appears on your screen as the switch does an ID chip test, a parity check, and tests all program, patch, translation, and other memory areas in the range you selected.

   If the switch finds a contiguous block of memory that fails, the test stops. A contiguous block may be one memory location or all testable main memory.

   It takes about five minutes to test each block of 256K words. You can compute the total test time by multiplying five minutes by the number of 256K blocks of switch memory. In DEFINITY Generic 2 it takes about 80 minutes to test 16M.

   > Field 2 shows the memory block The switch updates field 2 about every five minutes.

   > Field 3 shows the memory block address. The switch updates field 3 about every second.

   If you want to stop the test before the range is testeed, enter s

   > Fields 2 and 3 show the last tested memory location.

   > Field 4 shows the last testable memory block number for the switch configuration

   > Field 8 shows the type of failure (see Table 4-18). If there are no failures, field 8 contains a O.

   If you stopped the test and want to continue, enter x

   If a memory block fails, the test stops.

   > Field 2 shows the block number of the block that failed.

   > Field 3 shows the last memory location to fail in the block.

   > Field 4 shows the ending block number.

   > Field 7 shows the area of memory where the failure occurred (see Table 4-17).

   > Field 8 shows the type of failure (see Table 4-18).

   If the switch finds a duplication failure error (field 8 contains a 4), special error code 82 appears in the message line. Use Procedure 613 to examine duplication channel errors.

3. If the test stopped, enter `nf` to continue the test.

    The test continues from the location in field 4 plus one memory word.

    If you are testing an unduplicated system, special error code 74 may appear in the message line.

4. Enter `nd` to see each failure.

    Fields 2 and 3 show the first memory location of a block of contiguous failures.

    Field 6 shows the contents of the failing memory location for the on-line common control when field 5 contain a `0`.

5. If you want to see the contents of the off-line common control, enter `nd` until field 5 contains 1.

6. If there are any main or cache memory failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 5 for main memory failures or unit type 18 for cache memory failures.

7. If this is not the last failue, repeat steps 4-7.

    After you view all failures, the switch dashes fields 2-8. If you enter `nd` again, the first failing memory location appears.

8. If you want to examine memory failures, go to test 1.

9. If you want to find the state of health of the main and cache memory, go to test 2.

10. If you want to test memory continuously, go to test 4.

11. If you want to examine memory contents, go to test 5.

12. If you want to test cache supersets, go to test 6.

Test 4 - Operation

Use test 4 to test a range of memory continuously.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

   • To start the procedure, enter `p614`

   • If you are already in the procedure, but not in test 4, enter `t4`

     The test 4 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 614, TEST: 4
                 CONTINUOUS MEMORY READ AND MEMORY MATCH TEST

MEMORY LOCATIONS
   2.              Starting Memory Block: ▢
   3. Cache Superset or Memory Address: ▢
   4.                Ending Memory Block: ▢

 7. Failure Location: ▢
 8.     Failure Code: ▢








Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

The switch highlights field 2.

Fields 2-4 may show a default range of memory. If there were no failures in test 3, fields 2-4 show all testable memory.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Range of Memory Continuously

1. To select a specific starting memory block and memory location, enter `cf2` and enter the starting memory block, the starting address, and the ending memory block.

   If you do not enter a starting and ending memory location, the switch test all testable main memory including the program, patch, translation, and other areas. If the specific memory block and memory location are not in testable memory,special error code 80 appears in the message line.

2. Enter `x` to test a range of memory continuously.

   `WAIT` appears on your screen as the switch does an ID chip test, a parity check, and tests all program, patch, translation, and other memory areas in the range you selected.

   If the switch finds a contiguous block of memory that fails the test stops. A contiguous block may be one memory location or all testable main memory.

   It takes about five minutes to test each block of 256K words. You can compute the total test time by multiplying five minutes by the number of 256K blocks of switch memory. In DEFINITY Generic 2 it takes about 80 minutes to test 16M.

   Field 2 shows the memory block. The switch updates field 2 about every five minutes.

   Field 3 shows the memory block address. The switch updates field 3 about every second.

3. Enter `s` to stop the test.

   Fields 2 and 3 show the last tested memory location.

   Field 4 shows the last testable memory block number for the switch configuration

   Field 8 shows the type of failure (see Table 4-18). If there are no failures, field 8 contains a dash.

   If the switch finds a duplication failure error (field 8 contains a 4), special error code 82 appears in the message line. Use Procedure 613 to correct duplication channel errors. If you are testing an unduplicated system, special error code 74 may appear in the message line.

4. Enter `nd` to see each failure.

    Fields 2 and 3 show the first memory location of a block of contiguous failures.

    Field 6 shows the contents of the failing memory location for the on-line common control when field 5 contain a `0`.

5. If you want to see the contents of the off-line common control, enter `nd` until field 5 contains 1.

6. If there are any main or cache memory failures, go to *DEFINITY*™ *Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 5 for main memory failures or unit type 18 for cache memory failures.

7. If this is not the last failure repeat steps 4-7.

    After you view all failures, the switch dashes fields 2-8. If you enter `nd` again, the first failing memory location appears.

8. If you want to examine memory failures, go to test 1.

9. If you want to find the state of health of the main and cache memory, go to test 2.

10. If you want to test a range of memory, go to test 3.

11. If you want to examine memory contents, go to test 5.

12. If you want to test cache supersets, go to test 6.

Test 5 - Operation

Use test 5 to read the contents of any memory location or any range of memory locations.

In test 5 you can:

View the test 5 screen   *page 4-64*

Read the contents of a memory location   *page 4-65*

To View the Test 5 Screen

1. To see the test 5 screen, choose one or both of the following:

   ● To start the procedure, enter `p614`

   ● If you are already in the procedure, but not in test 5, enter `t5`

   The test 5 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 614, TEST: 5
                            READ MEMORY BY LOCATION

MEMORY LOCATIONS
     2.              Starting Memory Block: [  ]
     3. Cache Superset or Memory Address: [      ]
     4.                Ending Memory Block: [  ]

   5.                      Common Control: [ ]
   6. Contents of First Memory Location: [      ]
   7. Failure Location: [  ]




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[      ][     ][F3 DATA][     ][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

The switch dashes field 2.

Fields 2-4 may show default memory locations from test 3.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Read the Contents of a Memory Location

1. If you want to select a specific starting memory block and memory location, enter `cf2` and enter the starting memory block, the starting address, and the ending memory block.

   If you do not select a range, all testable main memory including the program, patch, translation, and other areas, are tested. If the specific memory block and memory location are not in testable memory special error code 80 appears in the message line.

2. Enter `x` to examine a memory location.

   Field 5 shows which memory you are accessing (see Table 4-16).

   Field 6 shows the contents of the first memory location for the on-line common control appears.

   Field 7 shows the failure location (see Table 4-17).

3. Enter `nd` to see the contents of the off-line common control for the same memory location.

   Field 5 shows which memory you are accessing (see Table 4-16).

   In an unduplicated switch you can only read the on-line common control memory.

4. Enter `nd` to step through the range of memory you selected

   The switch alternates between the on-line and off-line common control memory each time you enter `nd`

   Field 5 shows which memory you are accessing (see Table 4-16).

5. If this is not the last memory address in the range you selected repeat steps 4 and 5.

   After you view the contents of all memory in the range you selected, the switch dashes fields 2 and 3. If you enter `nd` again, the first memory location appears.

   Field 4 shows the ending memory block you selected.

6. If you want to examine memory failures, go to test 1.

7. If you want to find the state of health of the main and cache memory, go to test 2.

8. If you want to test a range of memory, go to test 3.

9. If you want to test memory continuously, go to test 4.

10. If you want to test cache supersets, go to test 6.

Test 6 - Operation

Use test 6 to test cache supersets continuously.

In test 6 you can:

To View the Test 6 Screen

1. To see the test 6 screen, choose one or both of the following:

   - To start the procedure enter `p614`
   - If you are already in the procedure, but not in test 6, enter `t6`

   The test 6 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 614, TEST: 6
                      TEST CACHE MEMORY SUPERSET

  3. Cache Superset: [_____]
  8.    Failure Code: [___]

















  Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

  enter command: ▬
  [_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS ]
```

   The switch highlights field 3.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Cache Supersets Continuously

1. To select a starting cache superset, enter `cf3` and enter the starting cache superset you want to test.

    The switch starts with the cache superset you selected and continues to test all cache supersets in the switch.

2. Enter `x` to test a range of cache supersets from the cache superset you selected.

    The switch continuously tests all cache supersets in the range you selected.   If there are no cache superset failures, the switch starts from the beginning of the cache superset (superset 0) and continues testing all cache supersets.

    The switch continues to test all cache supersets until it finds a failure or until you enter s

    If the switch finds any failures, the test stops.

    > Field 3 shows which cache superset failed.

    > Field 8 shows the type of failure (see Table 4-18).

3. After about 15 minutes, if there are no failures, enter s to stop the test.

    > Field 8 shows the type of failure (see Table 4-18).   If there are no failures, field 8 contains a 0 and field 3 shows the number of times the switch tested the entire cache superset.

4. If there are any cache superset failures, go to DEFINITY™ *Communications System Genetic* 2 *Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 18 for cache memory failures.

5. If you want to examine memory failures, go to test 1.

6. If you want to find the state of health of the main and cache memory, go to test 2.

7.   If you want to test a range of memory, go to test 3.

8. If you want to test memory continuously, go to test 4.

9. If you want to examine memory contents, go to test 5.

Special Error Codes

While using Procedure 614 you may see the following special error codes:

- `74=Memory match test was not done.`

  The switch has done other tests but not the memory match test. If this is a duplicated system, there may be problems with the duplication channel.

- `80=The equipment location is out of memory range; select another.`

  The specific memory block and memory location you selected are not in the range of testable memory. Select another memory location or check translation.

- `82=Use Procedure 613 Test 1 to clear duplication channel failures.`

  The switch found a duplication channel error. Use Procedure 613 to examine and correct duplication channel errors.

TABLE 4-16

Field 5 Common Control
0 = Reading memory from connected common control
1 = Reading memory from other common control

TABLE 4-18

Field 8 Failure Code
0 = No failures
1 = Memory mismatch
2 = Parity error
3 = Memory scrub error
4 = Duplication channel error
5 = Memory I/O error
6 = Memory ID chip error
7 = Parity check error
8 = Hard failure
9 = Error correction circuitry turned off
10 = Cache not present
11 = Cache turned off
12 = Cache ID chip error
13 = Less than 50% of supersets failed
14 = 50% or more supersets failed
15 = Tag/Valid error counter failure
16 = Cache I/O failure
17 = Cache invalidation failure

TABLE 4-17

Field 7 Failure Location
1 = Program memory
2 = Patch memory
3 = Program and patch memory
4 = Translation memory
5 = Program and translation memory
6 = Patch and translation memory
7 = Program, patch, and translation memory
8 = Other memory
9 = Program and other memory
10 = Patch and other memory
11 = Program, patch, and other memory
12 = Translation and other memory
13 = Program, translation, and other memory
14 = Patch, translation, and other memory
15 = Program, patch, translation, and other memory

Procedure Fields

The fields listed below are data entry fields.

- In tests 3-5 you can select a specific memory block and address to test in fields 2 and 3.

- In test 6 you can select a specific cache superset in field 3.

- In tests 4 and 5 you can select an ending memory block in field 4.

The meaning of the fields are:

2.	`First Memory Block`	Shows the first memory location the switch is testing. One block equals 256K.
3.	`Cache Superset or Memory Address`	Shows the memory address or cache superset.
4.	`Last Memory Block`	Shows the last memory location the switch is testing.
5.	`Common Control`	Contains a `0` if you are reading from the common control you are connected to or a 1 if you are reading memory from the common control you are not connected to.
		If you are connected to CC0 (`CONNECTED TO CC0` appears on your screen) a 0 appears in field 5 if you are viewing the CC0 memory or a 1 appears if you are viewing the CC1 memory. If you are connected to CC1 (`CONNECTED TO CC1` appears on your screen) a 0 appears if you are viewing the CC1 memory or a `1` appears if you are viewing the CC0 memory.
6.	`Number of Failed Words`	Shows the number of memory words that failed in test 2 and 3. In tests 1, 3, and 5, field 6 shows the octal contents of the memory location in fields 2 and 3.
7.	`Failure Location`	Shows what part of memory failed. Table 4-17 shows the memory area encodes.
8.	`Failure Code or Number of Failed Blocks`	In test 1, 3, 4, and 6, field 8 shows the failed block encodes. Table 4-18 shows the failed block encodes. In tests 2 and 3, field 8 shows the number of blocks that failed.

PROCEDURE 616 - ALARM INDICATOR TESTS

Purpose

Use Procedure 616 to test the alarm panel indicators when you suspect they are not working correctly.

Tests

Procedure 616 has two tests.

- Use test 1 to test all common-control alarm panel and attendant console alarm indicators.
- Use test 2 to test a selected common-control alarm panel or attendant console indicator.

Procedure Overview

Use Procedure 616 if you suspect that an alarm indicator is not working properly. If an error or alarm is in PMIDS and the light on the common-control alarm panel is not lit, the light is probably not working. To see if the alarm indicators are working, you (or an assistant) must be at the switch site.

The lights on the common-control alarm panel show you alarms sensed by the switch periodic software. They also point to the maintenance procedure you should use to fix the alarm.

Most of the alarm indicators tested in Procedure 616 are on the common-control alarm panel. Two indicators, ACK and ALM, are on the attendant console.

While testing the alarm indicators, the switch disables the automatic alarm origination feature (AAOF) and all diagnostic background tests. After you start test 1 or 2 and enter x the alarm indicators only light if you enter a command to turn them on.

It is a good idea to warn the person operating the attendant console that you are testing the attendant console indicators.

Figure 4-7 shows the alarm panel indicators the switch tests and the field number where a 1 appears when the indicator should be lit.
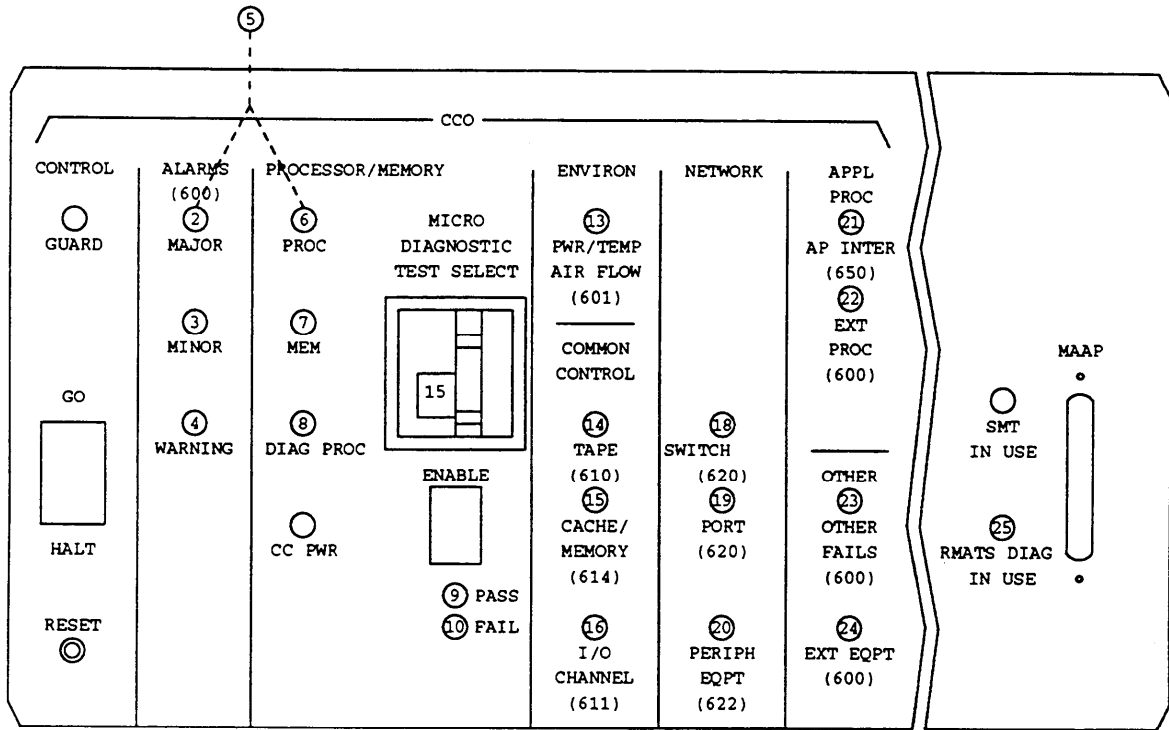
Figure 4-7. Common-Control Alarm Panel

To isolate a faulty indicator it may be useful to use both test 1 and test 2.

Use the following flowchart to guide you from test to test. You may want to remove the flowchart, and Figure 1, *Common-Control Alarm Panel,* and refer to them as you use this procedure.
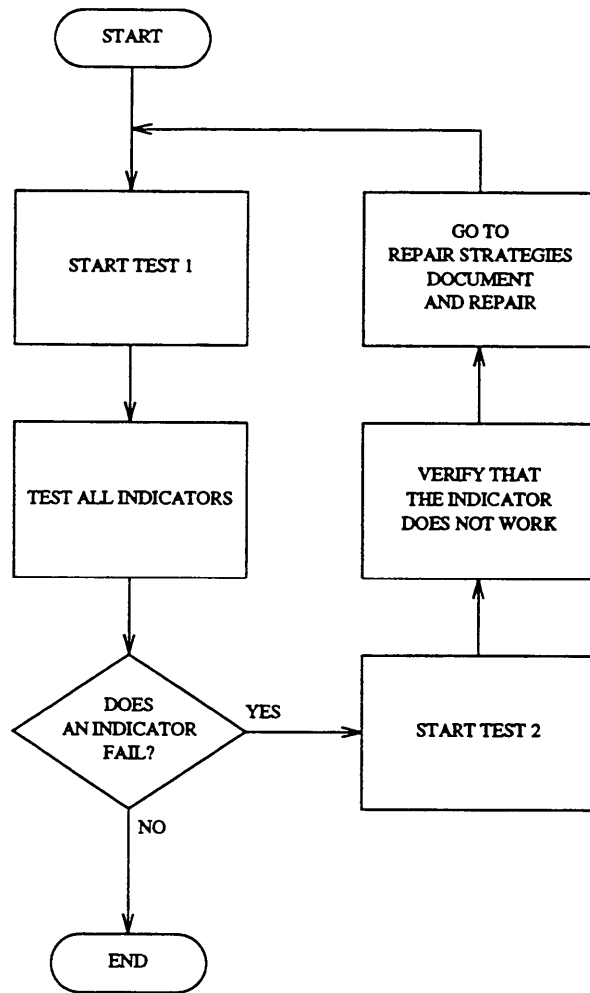
Figure 4-8. To Test Alarm Indicators

Test 1- Operation

Use test 1 to test all common-control alarm panel and attendant console alarm indicators.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure, but not in test 1, enter `t1`

   ● Otherwise, enter `p616`

   The test 1 screen, similar to the following, appears.

```
ENHANCED MODE - PROCEDURE: 616, TEST: 1
                    TEST ALL ALARM INDICATORS


ALARM INDICATORS                          19.           PORT: ▯
   2.               MAJOR : ▯             20.     PERIPH EQPT: ▯
   3.                MINOR: ▯             21.        AP INTER: ▯
   4.              WARNING : ▯            22.        EXT PROC : ▯
   5.      MAJOR AND PROC : ▯             23.      OTHER FAILS: ▯
   6.                 PROC : ▯            24.         EXT EQPT: ▯
   7.                  MEM: ▯             25. RMATS DIAG IN USE: ▯
   8.          DIAG PROC : ▯
   9.               PASS : ▯
  10.               FAIL: ▯
  11.                ALM: ▯
  12.                ACK: ▯
  13.   PWR/TMP AIR FLOW: ▯
  14.               TAPE ▯
  15.      CACHE/MEMORY: ▯
  16.       I/0 CHANNEL: ▯
  18.            SWITCH: ▯


Connected to CC0 ON-LINE ♡ ▯ MAJOR ▯▯ MINOR ▯▯ RUN TAPE ▯▯ BUSY OUT ▯▯ IN USE ▯▯ WAIT ▯

enter command: ▭
▭▭▭ ▭▭ ▭F3 DATA▭ ▭▭ ▭F5 HELP▭ ▭F6 FIELD▭ ▭F7 INPUT▭ ▭F8 CMDS▭
```

To find the meaning of a field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test All Alarm Indicators

1. Make sure that you (or an assistant) can see the common-control alarm indicators and the indicators on the attendant console.

2. Enter x to test all indicators.

   A 1 appears on all fields on your screen.

   The switch turns on all common-control panel indicators tested in Procedure 616. The switch controls all indicators until you enter x

   MAJOR and MINOR appear on your screen.

3. If an alarm indicator is not lit, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for failures that are not alarmed.

4. Enter nd to cycle the indicators on or off.

   When an indicator is off, all fields on your screen contain a 0.

   MAJOR and MINOR disappear from your screen.

   While the indicators are off, you may see the LEDs flash on the common-control alarm panel. The switch disables all AAOF and background tests.

5. Enter rs to stop the test.

   The switch restores all common-control alarm indicators to their previous state. The switch enables all AAOF and background tests.

6. If you want to test a single indicator, go to test 2.

Test 2 - Operation

Use test 2 to test a selected common-control alarm panel or attendant console indicator.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following.

   ● To start the procedure, enter `p616`

   ● If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────┐
│           ENHANCED MODE - PROCEDURE: 616, TEST: 2            │
│                 TEST A SINGLE ALARM INDICATOR               │
│                                                             │
│ ALARM INDICATORS                    19.          PORT: ▢    │
│   2.              MAJOR : ▢         20.    PERIPH EQPT: ▢    │
│   3.              MINOR: ▢          21.       AP INTER: ▢    │
│   4.            WARNING : ▢         22.       EXT PROC: ▢    │
│   5.      MAJOR AND PROC : ▢        23.     OTHER FAILS: ▢   │
│   6.               PROC : ▢         24.        EXT EQPT: ▢   │
│   7.               MEM: ▢           25. RMATS DIAG IN USE: ▢ │
│   8.          DIAG PROC : ▢                                  │
│   9.              PASS : ▢                                   │
│  10.              FAIL: ▢                                    │
│  11.               ALM: ▢                                    │
│  12.               ACK: ▢                                    │
│  13.  PWR/TMP AIR FLOW: ▢                                    │
│  14.              TAPE : ▢                                   │
│  15.     CACHE/MEMORY : ▢                                    │
│  16.                                                        │
│        I/O CHANNEL: ▢                                        │
│  18.            SWITCH : ▢                                   │
│                                                             │
│Connected to CC0 ON-LINE ♡ │MAJOR││MINOR││RUN TAPE││BUSY OUT││IN USE││WAIT│
│                                                             │
│enter command: ▬                                             │
│└──────┘└─────┘│F3 DATA│└─────┘│F5 HELP││F6 FIELD││F7 INPUT││F8 CMDS│
└─────────────────────────────────────────────────────────────┘
```

   Field 2 contains a 1.

   To find the meaning of a field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Single Indicator

1. To select an indicator choose from the following:

    - Enter nd until a 1 appears in the field you want.

       The previous field changes to a 0 and you can test the indicator you selected.

    - Enter cf and the field number of the indicator you want to test and then enter a 1

       The switch highlights the field you selected.

2. Make sure that you (or an assistant) can see the common-control alarm indicators and the indicators on the attendant console.

3. Enter x to turn on the selected indicator.

    The alarm indicator flashes on for one-half second and off for one-half second.

    Other common-control alarm indicators may flash when a 0 is in their field. These are the result of normal AAOF and background tests.

4. Make sure that the indicator is flashing.

5. Enter nd to test the next indicator.

    A 1 appears in the next field.

    The next alarm indicator flashes.

    After a 1 appears in field 25, the switch dashes all fields on your screen. If you enter nd again, field 2 contains a 1.

6. Enter rs to stop the test.

    The test 1 screen appears.

    The switch resumes normal activity. The switch restores all common-control alarm indicators to their previous state and enables the AAOF and background tests.

7. If you want to test all alarm indicator, go to test 1.

Special Error Codes

While using Procedure 616 the following special error code may appear on your screen:

● `80=AAOF and DP background tests cannot be disabled.`

   You tried to test an indicator and there is a software problem. The software cannot disable the AAOF or Diagnostic Processor (DP) tests. Refer to the repair strategy in *DEFINITY Communications System Generic 2 Maintenance Repair Strategies* (555-104-118).

Procedure Fields

The fields listed below are data entry fields.

● In test 2 you can enter a 1 in fields 2-25 to select an indicator.

The meaning of the fields are:

`2-25.` ALARM INDICATORS	Shows the status of the common-control and attendant console alarm panel indicators. A `1` appears and flashes when the indicator is lit.

PROCEDURE 618 - DIAGNOSTIC PROCESSOR AND REMOTE INTERFACE TESTS

Purpose

Use Procedure 618 to examine the diagnostic processor failure history log, to resolve alarms, to test the diagnostic processor complex, to call the remote maintenance, administration, and traffic system (RMATS), and to check the remote interface.

Tests

Procedure 618 has five tests.

- Use test 1 to examine the diagnostic processor failure history log and to resolve alarms.

- Use test 2 to test the diagnostic processor complex.

- Use test 3 to test the diagnostic processor complex continuously.

- Use test 4 to call RMATS, test the connection, and to see the test results.

- Use test 5 to get the results of the last test call.

Procedure Overview

The diagnostic processor complex is a subset of switch hardware and software designed for switch maintenance. The diagnostic processor detects external processor, external equipment, and auxiliary equipment alarms. The diagnostic processor complex consists of the diagnostic processor, the alarm interface, the remote interface, the 1200-baud modem serving RMATS, and the maintenance bus.

Use Procedure 618 to find the status of the diagnostic processor complex and to test the diagnostic processor complex.

Note that if you do Procedure 618 from the off-line side of a duplicated common control, the switch does not do the analog loop-around modem test in test 2 and 3.

Use the following flowchart to guide you from test to test and to help you select which test you want. You may want to remove the flowchart and refer to it as you use this procedure.
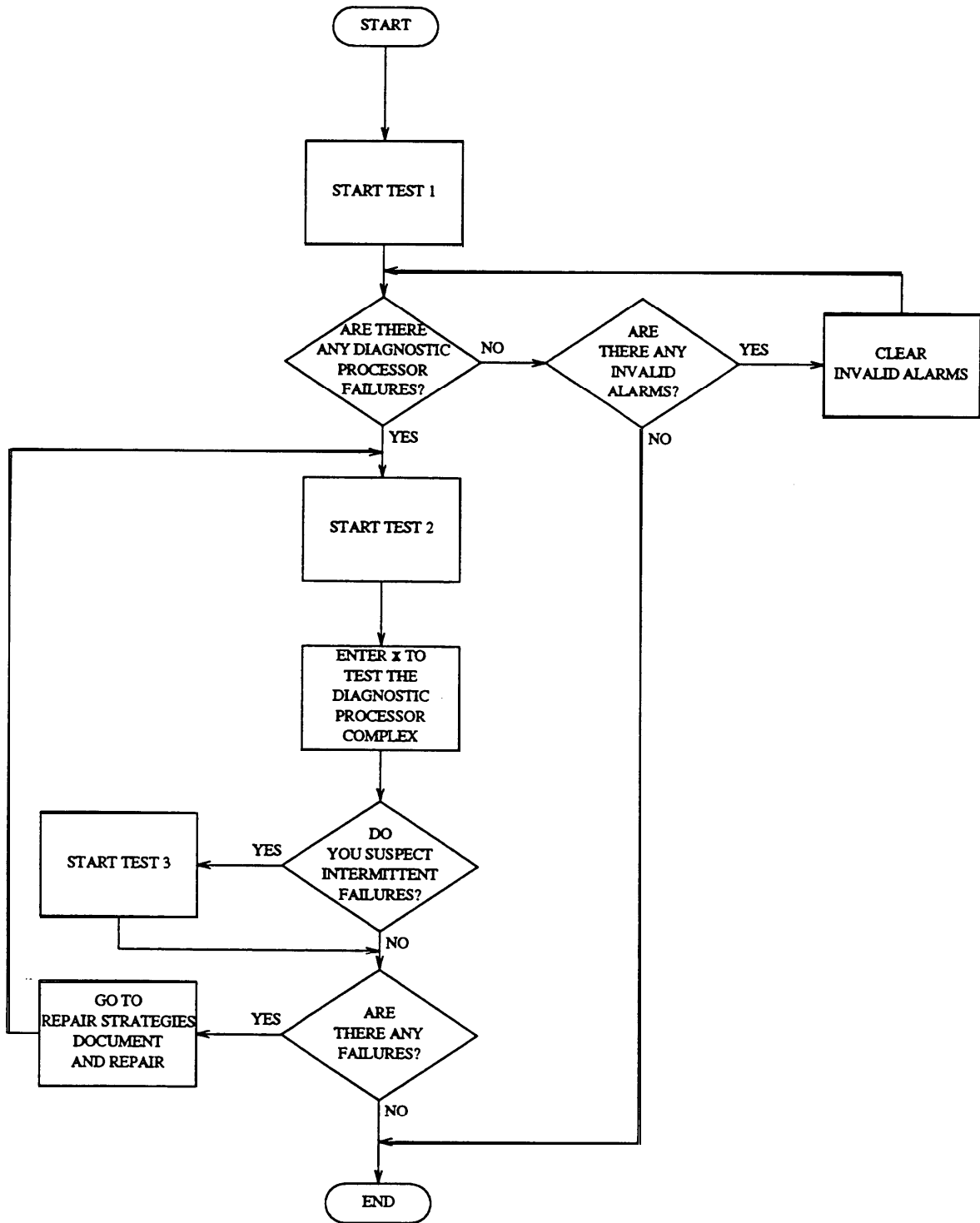
Figure 4-9. To Examine Alarms
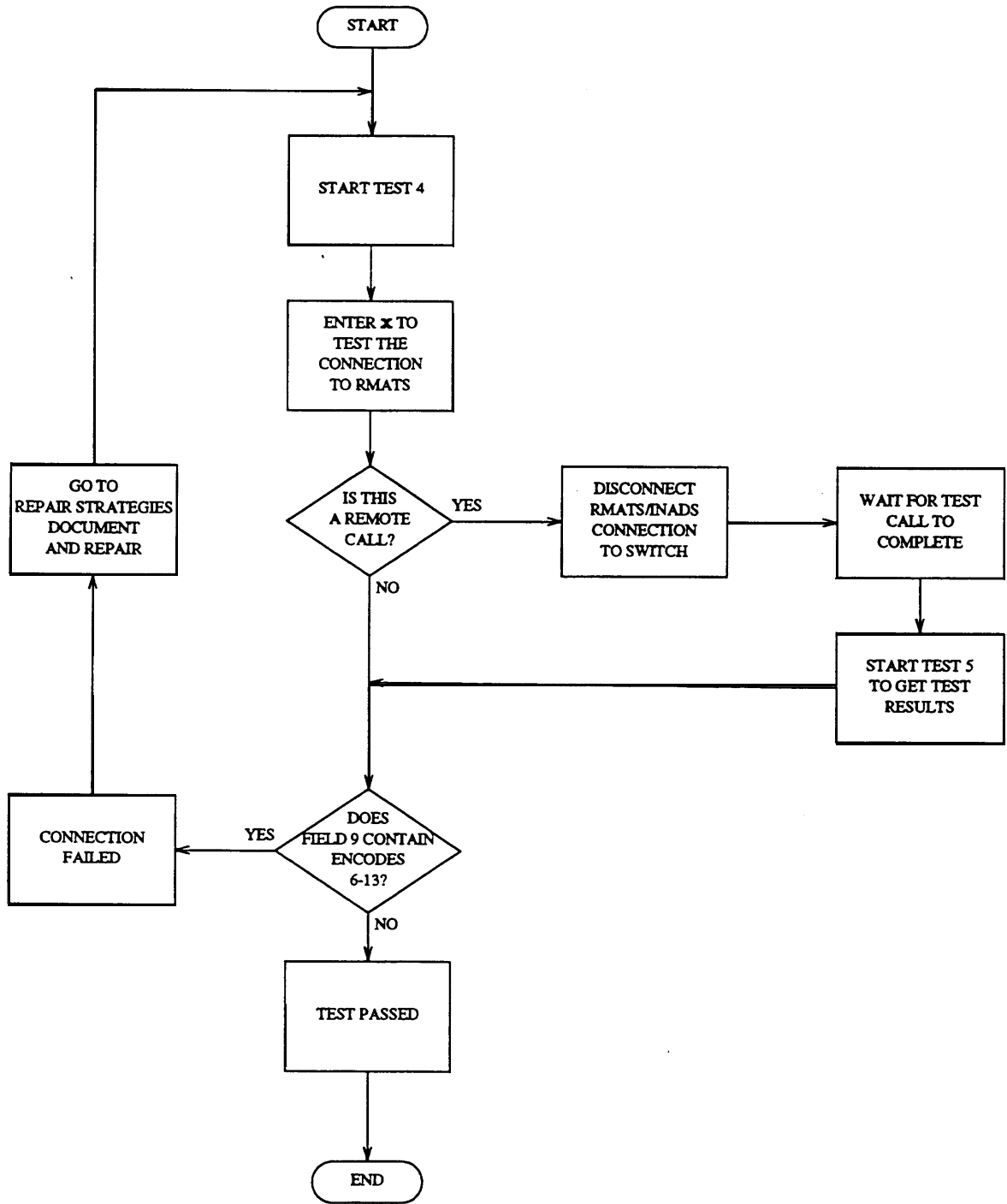
Figure 4-10. To Test the Connection to RMATS

Test 1 - Operation

Use test 1 to examine the diagnostic processor failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   * To start the procedure, enter `p618`

   * If you are already in the procedure, but not in test 1, enter `t1`

   The test 1 screen, similar to the following, appears.

```
               ENHANCED MODE - PROCEDURE: 618, TEST: 1
             EXAMINE THE DIAGNOSTIC PROCESSOR FAILURE HISTORY LOG

 2. Unit Type: ▢

EQUIPMENT LOCATION                      TIME STAMP
   3.   Module: ▢                          11. Stamp Index: ▢
   4.  Cabinet: ▢                          12.        Day: ▢
   5.  Carrier: ▢                          13.       Hour: ▢
   6.     Slot: ▢                          14.     Minute: ▢

 7.          Alarm Status: ▢
 8.         Failure Index: ▢
 9.    Specific Fault Code: ▢
10. Number of Times Failed: ▢




Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▄
_____ ││_____││ F3 DATA ││_____││ F5 HELP ││ F6 FIELD ││ F7 INPUT ││ F8 CMDS │
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Diagnostic Processor Failure History Log

1. Enter x to sort the diagnostic processor failure history log.

   WAIT appears on your screen.

      Field 8 shows the number of diagnostic processor or remote interface, external equipment, or external processor failures. If there are no failures, field 8 contains a 0.

2. Enter nc to see each failure.

      Field 2 shows the unit type (see Table 4-19).

      Fields 3 through 6 show the equipment location or the unit number of the external equipment if field 2 contains a 63.

      Field 7 shows the alarm status (see Table 4-21).

      Field 8 shows you which failure you are viewing. The number in field 8 decreases by one as you view each alarm.

      Field 9 shows the specific fault code. Record this number.

      Field 10 shows the number of times the diagnostic processor complex failed.

      Field 11 shows you which time stamp you are viewing (see Table 4-23).

      Fields 12-14 show when the most recent error occurred.

3. If you want to see other time stamps, choose from the following:

   ● To see when the error first appeared, enter nd until field 11 contains a 2.

      Fields 12-14 show when the error first appeared.

   ● To see when the error became an alarm, enter nd until field 11 contains a 3.
      Fields 12-14 show when the error became an alarm.

   ● To see when the most recent error occurred, enter nd until field 11 contains a 1.

      Fields 12-14 show when the most recent error occurred.

4. If you want to examine alarms for the next unit type, enter nu

   The number in field 8 decreases by the number of entries you skipped.

5. If there are any failures, go to test 2 to test the diagnostic processor.

6. If there are more failures, repeat steps 2-6.

   After you view all failures, the switch dashes fields 2-14. If you enter nc again, the summary appears.

7. If you want to test the diagnostic processor complex, go to test 2.

8. If you want to test the diagnostic processor complex continuously, go to test 3.

9. If you want to call RMATS and test the connection, go to test 4.

10. If you want to see the results of a test call, go to test 5.

To Resolve Alarms

You may want to resolve any invalid alarms from the diagnostic processor failure history log.

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nu or nc until the alarm you want to resolve appears.
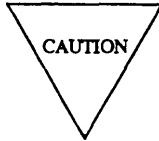
CAUTION — Record all alarms before you resolve alarms from the log. Then you will have a record you can use for future troubleshooting.

2. Enter cdx to resolve alarms.

    Field 7 contains a 5 when you resolve a single alarm (see Table 4-21).

    Field 8 shows the number of alarms. If you resolved all alarms field 8 contains a 0.

    The switch turns off **OTHER FAILS, EXT PROC** or **EXT EQPT** alarm indicators, if there is no other reasons for them to be on.

3. If you want to test the diagnostic processor complex, go to test 2.

4. If you want to test the diagnostic processor complex continuously, go to test 3.

5. If you want to call RMATS and test the connection, go to test 4.

6. If you want to see the results of a test call, go to test 5.

Test 2 - Operation

Use test 2 to test the diagnostic processor complex.

In test 1 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p618

   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 618, TEST: 2
                   TEST THE DIAGNOSTIC PROCESSOR ONCE

  2. Unit Type: ☐


EQUIPMENT LOCATION
    3.   Module: ☐
    4. Cabinet: ☐
    5. Carrier: ☐
    6.    Slot : ☐

  7.        Alarm Status: ☐
  8.       Failure Index: ☐
  9. Specific Fault Code: ☐






Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[        ][       ][F3 DATA ][       ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

   If you want to know the meaning of each field on your screen, go to *Procedure Fields* at the back of this procedure.

To Test the Diagnostic Processor

1. Enter x to test the diagnostic processor.

   WAIT appears on your screen as the switch tests the diagnostic processor parity checker, the interface RAM from the 501CC to the diagnostic processor, and does an analog loopback test on the 1200 baud modem serving RMATS.

   If either modem is in use, the modem is not tested. Special error code 80 appears in the message line. If RMATS is using modem 0, 1, or both modems, special error codes 82, 83, or 84 appear in the message line. These error codes may flash as the switch tries to test each modem.

   If DMIDS fills up, special error code 81 appears in the message line. The test continues, but old failure information in DMIDS is lost.

   After about a minute, WAIT disappears from your screen.

      Field 8 shows the number of failures. If there are no failures, field 8 contains a 0.

2. Enter nc to see each failure.

      Field 2 shows the unit type (see Table 4-19).

      Fields 3-6 show equipment location, the unit number of external equipment, or the unit number of the external processor.

      Field 8 shows the failure index. The number in field 8 decreases by one as you view each alarm. If field 8 contains a 99, there are 99 or more failures in the log.

      Field 9 shows the specific fault code. Record this number.

   When all circuits with the same unit type pass, the switch marks the alarms resolved. The switch turns off **OTHER FAILS, EXT PROC** or **EXT EQPT** on the common-control alarm panel if there is no other reason for them to be on.

3. If you want to see the first failure in the next unit type, enter nu

   If there are diagnostic processor or remote interface failures, the switch turns on the red LED on the diagnostic processor remote interface circuit packs. The switch does not turn on LEDS for external equipment or external processor failures.

4. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 60 for a diagnostic processor failure, unit type 63 for an external equipment failure, or unit type 64 for. an external equipment failure.

5. If this is not the last failure repeat steps 2-5.

   After you view all failures, the switch dashes fields 2-14. If you enter nc again, the summary appears.

6. If you want to examine the failure history log or resolve alarms, go to test 1.

7. If you want to test the diagnostic processor complex continuously, go to test 3.

8. If you want to call RMATS and test the connection, go to test 4.

9. If you want to see the results of a test call, go to test 5.

Test 3 - Operation

Use test 3 to test the diagnostic processor complex continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   • To start the procedure, enter `p618`

   • If you are already in the procedure, but not in test 3, enter `ts`

   The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 618, TEST: 3
                 CONTINUOUSLY TEST THE DIAGNOSTIC PROCESSOR

  2. Unit Type: ▢

EQUIPMENT LOCATION
    3.   Module: ▢
    4.  Cabinet: ▢
    5.  Carrier: ▢
    6.    Slot : ▢

  7.            Alarm Status: ▢
  8.           Failure Index: ▢
  9.     Specific Fault Code: ▢
 10.             Fault Index: ▢
 13. Number of Times Tested: ▢
 14. Number of Times Failed: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS ]
```

2. To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Diagnostic Processor Complex Continuously

1. Enter x to test the diagnostic processor complex continuously.

   WAIT appears on your screen. The switch continually does a parity test and tests the interface RAM from the 501CC to the diagnostic processor.

   If either modem is in use, the switch does not test the interface RAM, the error status bytes, or do the analog loopback test.   If the modems are in use, special error code 80 appears. If RMATS is using modem 0, 1, or both, special error codes 82, 83, or 84 appear in the message line.   These error codes may flash as the switch tests each modem.

   > Field 9 contains a flashing 0. If the switch finds a failure, field 9 contains a flashing specific fault code.

   > Field 13 shows the number of times tested.

   > Field 14 shows the number of times the diagnostic processor complex failed.

   If the test passes after one cycle, the switch turns on the green LED on the diagnostic processor, remote interface, and AI circuit packs.

   If the diagnostic processor remote interface circuit pack fails, the switch turns on the red LED on the circuit pack. The LED stays lit until the circuit pack passes the test.

   If DMIDS fills up, special error code 81 appears.

   > Field 8 shows the number of failures. If field 8 contains a 99, there are 99 or more failures.

   Enter s and examine all test results or enter x to start the test again.
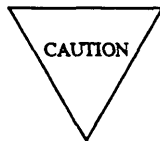
   ▽ CAUTION   If you start the test again old failure data is lost.

2. Enter s to stop the test.

   > Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

   If the switch finds any failures the following appears.

   > Field 8 shows the number of failures. Field 13 shows the number of times tested.

   > Field 14 shows the number of times failed.

3. Enter `nc` to see each failure.

   Field 2 shows the unit type (see Table 4-19).

   Fields 3-6 show the equipment location or the unit number of external equipment or the external processor.

   Field 8 shows you which failure you are viewing. The number in field 8 decreases by one as you view each failure.

   Field 9 shows the specific fault code. Record this number.

   Field 10 shows the number of times the specific fault code was logged against the failure.

   Field 13 shows the number of times the switch tested the diagnostic processor complex.

   Field 14 shows the number of times the diagnostic processor complex failed.

4. If you want to view failures of the next unit type, enter `nu`

   The first failure for the next numerical unit type appears. The number in field 8 decreases by the number of failures you skipped.

5. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 60 for a diagnostic processor failure, unit type 63 for an external equipment failure, or unit type 64 for an external equipment failure.

6. If this is not the last failure, repeat steps 3-6.

   After you view all failures, the switch dashes fields 2-14. If you enter `nc` again, the summary appears.

7. If you want to examine the failure history log or resolve alarms, go to test 1.

8. If you want to test the diagnostic processor complex, go to test 2.

9. If you want to call RMATS and test the connection, go to test 4.

10. If you want to see the results of the last test call, go to test 5.

Test 4 - Operation

Use test 4 to call RMATS, test the connection, and to see the test results.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

    ● To start the procedure, enter `p618`

    ● If you are already in the procedure, but not in test 4, enter `t4`

    The test 4 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 618, TEST: 4
              TEST THE DIAGNOSTIC PROCESSOR , REMOTE INTERFACE, AND RMATS

9. Call State: ☐

















Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT

enter command: ▬
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Connection to RMATS

Note that you cannot run test 4 in the off-line common control.

1. Enter x to test the connection to RMATS.

   Field 9 shows the current state of the call (see Table 4-22).

   The switch rst checks whether AAOF is allowed and gets the RMATS phone number. If the AAOF is not a translated feature or if there is no phone number, special error code 74 appears. If the switch finds the phone number and comet translation the switch enables AAOF.

   The switch then turns off the red and green LEDs on the remote interface circuit pack. The switch turns off the LEDs so RMATS can control the green LED.

   The switch waits for modem 0 to become idle so it can make a test call. The switch always uses modem 0 to call RMATS. RMATS, though, can call in on modem 0 or modem 1.

   When RMATS receives the test call, it turns on the green LED on the remote interface circuit pack to acknowledge that it has received a test call.

   After about one second, RMATS turns off the green LED on the remote interface board and disconnects the call from its end.

   When the switch senses that there is no carrier on modem 0, the test call is complete.

   Field 9 shows the final call state of the test. If field 9 contains encodes 6 through 13 the test call failed.

   If you are trying to run test 4 in the off-line common control special error code 85 appears in the message line. If the switch cannot get a data line because too many agents are trying to access the port special error code 87 appears on the message line. If special error code 88 appears on the message line, go to test 2 or test 3 to find the status of the diagnostic processor complex.

   If you want to stop a test call in progress, enter s

   Field 9 shows the current call state of test.

2. If you are calling remotely hang up the phone and wait for the test call to complete.

   The switch continues the test and stores the final call state.

   To get the test results when you run test 4 remotely, use test 5.

3. If you want to examine the diagnostic processor failure history log, go to test 1.

4. If you want to test the diagnostic processor complex, go to test 2.

5. If you want to test the diagnostic processor complex continuously, go to test 3.

6. If you want to see the results of a test call, go to test 5.

Test 5 - Operation

Use test 5 to get the results of the last test call.

In test 5 you can:

To View the Test 5 Screen

1. To see the test 5 screen, choose one or both of the following:

   ● To start the procedure, enter `p618`

   ● If you are already in the procedure, but not in test 5, enter `t5`

   The test 5 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 618, TEST: 5
           DIAGNOSTIC PROCESSOR/REMOTE INTERFACE/REMOTE RMATS TEST

9. Call State: ❏

















Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▬
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Get the Results of the Last Test Call

1. Enter x to get the state of the last test call.

   Field 9 shows the final call state of last test call done in test 4 (see Table 4-22). If field 9 contains encodes 6 though 13 the test call failed.

2. If you want to examine the diagnostic processor failure history log, go to test 1.

3. If you want to test the diagnostic processor complex, go to test 2 or test 3.

4. If you want to make a test call, go to test 4.

Special Error Codes

While using Procedure 618 you may see the following special error codes:

- `80=Not all tests were done.`

   Appears if either modem is in use and the modem is not tested.

- `81=DMIDS  overflow.`

   Appears if DMIDS becomes full during the test. The switch continues to test, but overwrites old information in the DMIDS error log.

- `82=Modem 0 is busy.`

   Appears if RMATS is using modem 0.

- `83=Modem 1 is busy.`

   Appears if RMATS is using modem 1.

- `84=Modems 0 and 1 are busy.`

   Appears if RMATS is using both modem 0 and modem 1.

- `85=Test cannot run in off-line processor.  You are trying to run test 4 in the off-line common control .`

- `86=You can not run this procedure from this port.`

   Appears when you try to run a procedure from the wrong communications port.

- `87=Procedure cannot be moved to the pseudo port to allow a test call.`

   The switch cannot get a data line because too many agents are trying to access the port.

- `88=I/0 to the diagnostic processor failed.`

   Go to test 2 or test 3 to find the status of the diagnostic processor complex.

TABLE 4-19

Field 2 Unit Type		
60	=	Diagnostic processor or remote interface
63	=	External equipment
64	=	External processor

TABLE 4-20

Field 4 External Equipment Encodes		
1	=	Auxiliary cabinet battery holdover
2	=	Auxiliary cabinet temperature
3	=	Auxiliary cabinet fan
4	=	Auxiliary cabinet circuit breaker
5	=	Auxiliary cabinet frequency generator
6	=	Auxiliary cabinet rectifier
7	=	Multiple external or auxiliary equipment failures
8	=	Type unknown (multiple errors)

TABLE 4-21

Field 7 Alarm Status		
0	=	No alarms
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarm resolved

TABLE 4-22

Field 9 Call State		
0	=	Test call not run
1	=	Dialing
2	=	Connected to remote modem
3	=	Test data received
4	=	Call passed, modem 0 idle, AAOF disabled
5	=	Call passed, modem 0 idle, AAOF enabled
6	=	Call failed, I/O to diagnostic processor failed
7	=	Call failed, cannot call out
8	=	Call failed, test data not received
9	=	Call failed, test call not terminated
10	=	Call failed, test call aborted
11	=	Call failed, modem 0 busy
12	=	Call failed, modem 1 busy
13	=	Call failed, modems 0 and 1 busy

TABLE 4-23

Field 11 Stamp Index		
1	=	Error last occurred
2	=	Error began
3	=	Error became alarm

Procedure Fields

The meaning of the fields are:

2.	Unit Type	Shows the unit type on your screen. Table 4-19 shows the unit type encodes.
3-6.	EQUIPMENT LOCATION	If the unit type is 60, fields 3-6 show the equipment location of the diagnostic processor/remote interface circuit pack. If the unit type is 63, field 3 shows the unit number of the external equipment and field 4 shows the external equipment encode. If the unit type is 64, field 3 shows the unit number of the external processor.
7.	Alarm Status	Shows the severity of the alarm or error. Table 4-21 shows the alarm status encodes.
8.	Failure Index	Initially shows the number of failures. Then shows which failure you are viewing.
9.	Specific Fault Code or Call State	In tests 1-3, shows the specific fault code logged against the failure. Specific fault codes held to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems. In tests 4 and 5, field 9 shows the call progress and final call state of a test call to RMATS. Table 4-22 lists the call state encodes.
10.	Number of Times Failed or Failure Index	Shows the number of times the circuit failed.
11-14.	TIME STAMP, Number of Times Failed or Number of Times Tested	If field 11 contains a 1, fields 12-14 show when the alarm last occurred or was resolved. If field 11 contains a 2, fields 12-14 show when the error began. If field 11 contains a 3, fields 12-14 show when the error became an alarm. In test 3, field 13 shows the number of times the diagnostic processor was tested. In test 3 field 14 shows the number of times the diagnostic processor failed.

5. NETWORK AREA PROCEDURES

This chapter describes network area procedures. Network procedures deal with the digital network and its peripherals. Included are testing and recording capabilities for much of the hardware. Network procedures include Procedures 620-625, 627, 631, 635 640, 642-644, and 646-648. Procedures 631, 635, 640, 642-644 are auxiliary procedures (they do not do any tests) used to monitor switch information.

The following list summarizes the purpose of each network procedure.

PROCEDURE 620 - NETWORK TESTS

Use Procedure 620 to examine failures in the digital network, to resolve alarms, to test a single circuit or a range of circuits in the switch, to diagnose switch failures, and to do a circuit pack verification test.

PROCEDURE 621 - NETWORK DUPLICATION TESTS

Use Procedure 621 to examine the network TMS or module-control carrier (MCC) duplication channels switch history log to clear switches from the history log, to test the TMS or MCC, and to do a hard or soft switch between TMS or module-control carriers, to initialize the TMS or MCC, or to lock the module control on-line.

PROCEDURE 622 - NETWORK PERIPHERALS TESTS

Use Procedure 622 to examine the network peripherals failure history log, to resolve alarms, to test network peripheral and to test transmissions to network peripherals.

PROCEDURE 623 - ANI TRUNK CIRCUIT TESTS

Use Procedure 623 to examine the automatic number identification (ANI) trunk failure history log, to resolve alarms, and to test ANI trunk circuits.

PROCEDURE 624 - CONTACT INTERFACE TESTS

Use Procedure 624 to test a single contact or all contacts on a contact interface circuit pack.

PROCEDURE 625 - SYNCHRONIZATION REFERENCE MONITOR TESTS

Use Procedure 625 to find the health of synchronization references and all DS1, remote carrier group (RCG), or primary rate interface (PRI) circuit packs, to switch between synchronization reference sources, to disable or enable the automatic reference switching done by the synchronization periodic testing software, to view errored seconds information, to clear misframes for an individual board, and to clear all slips in the system.

PROCEDURE 628 - UNIVERSAL BUS TESTS

Use Procedure 628, in a universal module, to examine the TDM and LAN bus failure log, to resolve alarms, to test the TDM and LAN buses, to busy out or release a bus or call processing timeslots, and to switch the control channel and tone timeslots from one bus to another.

PROCEDURE 631 - TRUNK GROUP BUSY OUT

Use Procedure 631 to find the status of a trunk or all trunks in a trunk group, and to busy out or release from busy a trunk or all trunks in a trunk group.

PROCEDURE 635 - CAUSE OF MAINTENANCE BUSY OUT

Use Procedure 635 to find why BUSY OUT appears on your screen, to busy out or release a range, a port, or a port assigned to an extension, or to find the status of a port or extension.

PROCEDURE 640 - TRUNK TESTS

Use Procedure 640 to examine the trunk failure history log, to resolve alarms, to busy out or release trunks, and to monitor trunk activity.

PROCEDURE 642 - TERMINAL-TO-TRUNK TEST CALL

Use Procedure 642 to make a terminal-to-trunk test call, by trunk dial access code, to a single trunk or to all trunks in a trunk group.

PROCEDURE 643 - TERMINAL-TO-TONE TEST CALL

Use Procedure 643 to test tones when failures are reported by users or detected by the switch.

PROCEDURE 644 - TERMINAL-TO AUXILIARY-TONE TEST CALL

Use Procedure 644 to test auxiliary tones when failures are reported by users or detected by the switch.

PROCEDURE 646 - ADFTC OR MTCP, MODEM POOLING, AND DIGITAL FACILITY TESTS

Use Procedure 646 to test the analog/digital facility test circuit pack (ADFTC) or the maintenance test circuit pack (MTCP), modem pool members (MPM), and digital facilities (DF).

PROCEDURE 647- ATMS TESTS

Use Procedure 647 to examine the automatic transmission measurement system (ATMS) trunk failure history log, to resolve alarms, to measure transmissions of a circuit or a range of circuits, to check the supervision capabilities of a circuit or a range of circuits, to do transmission tests between near-end and far-end facilities and measure loss, noise, and echo impairments when you suspect intermittent problems with analog trunks.

PROCEDURE 648 - ISDN PRI FACILITIES TESTS

Use Procedure 648 to examine the integrated services digital network (ISDN) facilities failure history log, to resolve ISDN PRI alarms, and to test the ISDN PRI facilities.

PROCEDURE 620 - NETWORK TESTS

Purpose

Use Procedure 620 to examine failures in the digital network, to resolve alarms, to test a single circuit or a range of circuits in the switch, to diagnose switch failures, and to do a circuit pack verification test.

Tests

Procedure 620 has five tests.

- Use test 1 to examine the digital network failure history log and to resolve alarms.

- Use test 2 to test a circuit or a range of circuits.

- Use test 3 to test a circuit or a range of circuits continuously.

- Use test 4 to diagnose switch failures.

- Use test 5 to do a verification test of a circuit pack.

Procedure Overview

Procedure 620 tests the time multiplexed switch (TMS) and network module hardware, including the network ports.

The digital network hardware is divided into unit types. A unit type may be a circuit, a circuit pack, or more than one circuit (for example the time slot interchanger (TSI) circuitry). Use Procedure 620 to test the digital network hardware by equipment location or by unit type.

In a universal module, when testing a port circuit pack, the module processor requests a test from the port circuit pack and then waits for the response. Since the port circuit packs in a universal module can do more extensive testing, it may take longer to test universal port circuit packs than it takes to test traditional port circuit packs.

In test 1 you can examine the digital network failure history log and resolve alarms.

In tests 2 and 3 you can test a network circuit or a range of network circuits. Test 2 is useful if you are diagnosing a range of failures. If you are diagnosing a single circuit failure, use test 4.

In test 4 you can select a specific equipment location and have the switch diagnose a problem to locate a fault or verify the integrity of any circuit (or circuit pack for DS1, RCG, or ISDN PRI circuit packs).

Test 4 is the best test to use for diagnosing circuit problems because:

- Test 4 does more tests than test 2 or 3 for some circuit packs.

- The specific fault code that appears in test 4 often provides more than one alternate indicted circuit to replace.

  If replacing the first indictment does not fix the problem, you have more alternatives than test 2 provides.

- If the circuit pack you selected fails with certain types of failures, test 4 continues to test circuit packs that interface to the circuit pack you selected.

  If, for example, you select a universal modules port circuit that fails test 4 because of a communications failure from the port to the module processor, the diagnoses will continue and the universal bus interface circuit pack will be tested. If the universal bus interface (UBI) fails, it will be indicted. If the UBI passes, the test either continues its diagnosis or indicts the original circuit pack you selected (depending on the type of failure).

- If you replace a circuit pack that failed, test 4 automatically runs a verification test on the new circuit pack and also runs the original test that caused the failure.

  When a circuit pack is indicted, test 4 pauses while you replace the circuit pack. When you install a new circuit pack, a verification test is done (identical to test 5). Then test 4 tests the new circuit pack with the original test that caused the circuit pack to fail.

In tests 4 and 5 the hardware may also show its status by turning on a circuit pack's red LED if a circuit pack fails or by turning on the green LED if a circuit pack passes.
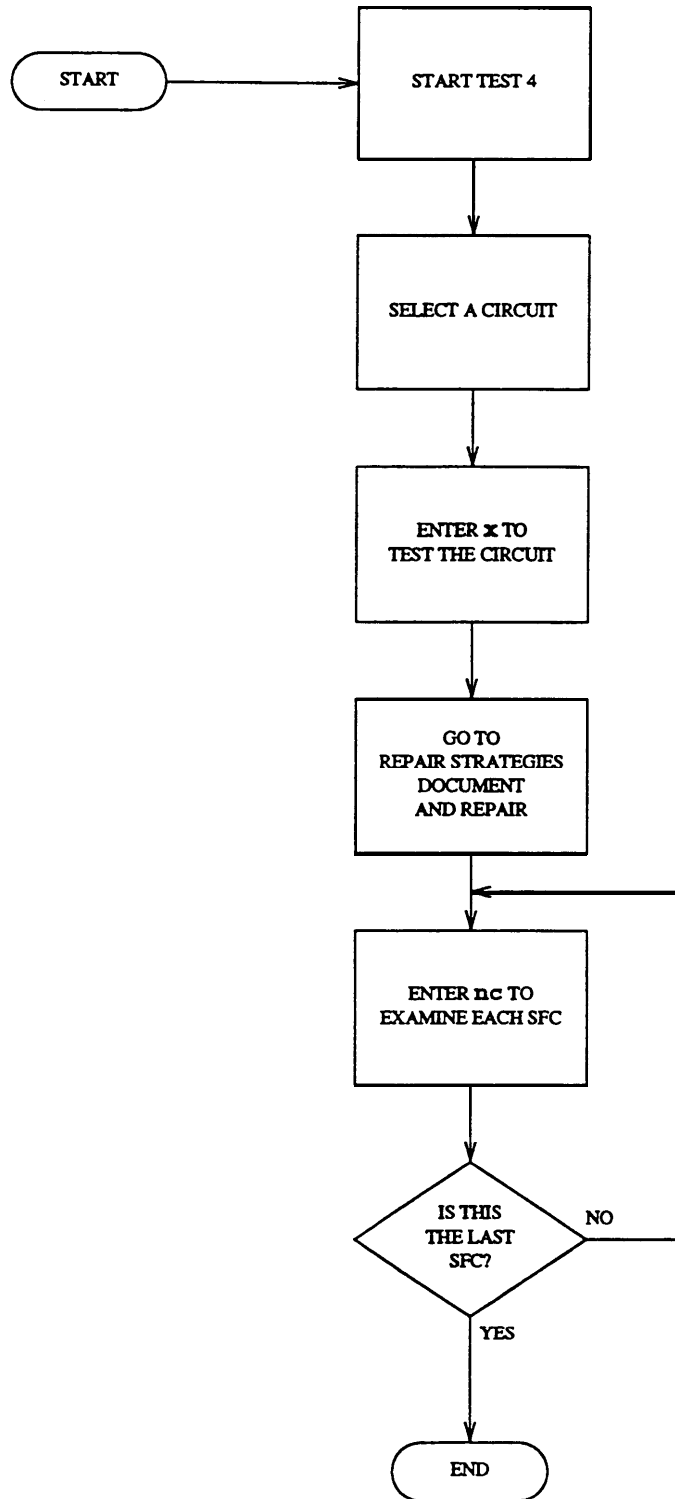
Figure 5-1. To Diagnose Switch Failures

Test 1- Operation

Use test 1 to examine the digital network failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter `t1`

   - Otherwise, enter `p620`

   The test 1 screen, similar to the following, appears.

```
               ENHANCED MODE  -  PROCEDURE: 620, TEST: 1
                  EXAMINE THE NETWORK FAILURE HISTORY LOG

 2. Unit Type: ▢


EQUIPMENT LOCATION
   3.   Module: ▢
   4.  Cabinet: ▢
   5.  Carrier: ▢
   6.     Slot: ▢
   7.  Circuit: ▢


  8.     Location Status: ▢
  9.        Alarm Status: ▢
 12. Specific Fault Code: ▢
 13.       Failure Index: ▢
 14.        Times Failed: ▢




Connected to CC0 ON-LINE ♡ ┃ MAJOR ┃┃ MINOR ┃┃ RUN TAPE ┃┃ BUSY OUT ┃┃ IN USE ┃┃ WAIT


enter command: ▬
┃_____┃┃_____┃┃F3 DATA ┃┃_____┃┃F5 HELP ┃┃F6 FIELD┃┃F7 INPUT┃┃F8 CMDS┃
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Digital Network Failure History Log

1. Enter x to sort the digital network failure history log.

   The switch sorts network failures by alarm severity. Major alarms appear first, followed by minor alarms, and then warning. Errors appear last. Alarms and errors appear by unit type priority and not in numeric order. These priorities ensure that you repair the most service-affecting problems first.

   Field 13 shows the total number of failures. If there are no failures, field 13 contains a 0.

2. Enter nc to see each failure.

   Field 2 shows the unit type (see Table 5-l).

   Fields 3-7 show the equipment location.

   Field 8 shows the location status (see Table 5-2).

   Field 9 shows the alarm status (see Table 5-3).

   Field 12 shows the specific fault code. Record this number.

   Field 13 shows which failure you are viewing. The number in field 13 decreases by one as you view each failure and shows the number of remaining failures.

   Field 14 shows the number of times the circuit failed. A 99 appears if a circuit failed 99 or more times.

3. Go to test 4 and test the circuit that failed.

4. If there are more failures, repeat steps 2 and 3.

   After you view all failures, the switch dashes fields 2-14. If you enter nc again, the failure summary appears.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to test a circuit or a range of circuits, go to test 2.

7. If you want to test a circuit or a range of circuits continuously, go to test 3.

8. If you want to diagnose switch failures, go to test 4.

9. If you want to do a verification test, go to test 5.

To Resolve Alarms

You may want to resolve any invalid alarms from the network failure history log.

1. If you want to resolve all alarms, make sure that the failure summary is on your screen.

   If the failure summary is not on your screen, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter nc until the alamr you want to resolve appears.
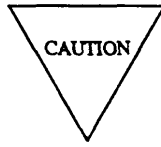
CAUTION   Record all alarms and their specific fault codes, before you resolve them. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

   If you resolve a single alarm, field 9 contains a 5.

   Field 13 shows the number of failures still in the log. If you resolve all alarms and there are no errors recorded, field 13 contains a 0.

   The switch marks network alarms resolved. The switch turns off **SWITCH, PORT, MAJOR, MINOR,** or **WARNING** on the common-control alarm panel if there are no other reasons for them to be on. MAJOR or MINOR disappear from your screen if there is no other reason for them to be on.

4. If you want to test a circuit or a range of circuits, go to test 2.

5. If you want to test a circuit or a range of circuits continuously, go to test 3.

6. If you want to diagnose switch failures, go to test 4.

7. If you want to do a verification test, go to test 5.

Test 2 - Operation

Use test 2 to test a single network circuit or a range of circuits.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p620
   - If you are already in the procedure but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 620, TEST: 2
                            TEST A NETWORK CIRCUIT

  2. Unit Type:    ▯

EQUIPMENT LOCATION                         FAILURE SUMMARY
   3.  Module:  ▯                             13. Number of Circuits Tested: ▯
   4.  Cabinet: ▯                             14.       Number of Failures:  ▯
   5.  Carrier: ▯
   6.    Slot:  ▯
   7.  Circuit: ▯

STATUS
   8. Location Status: ▯
   9.    Alarm Status: ▯
  10.   Circuit Status: ▯

FAULT
  11.             Index: ▯
  12. Specific Fault Code: ▯

Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |


enter command: ▱
_____|_____|| F3 DATA ||_____|| F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS |
```

The switch highlights field 2.

Fields 2-7 may contain a default unit type and equipment location from test 1,3,4, or 5, from Procedure 600 Test 1 or 2, or from Procedures 621, 622, 625, 646, 647, or 648.

Field 8 shows the location status of the default equipment location (see Table 5-2).

Field 9 shows the alarm status of the default equipment location (see Table 5-3).

Field 10 shows the circuit status of the default equipment location (see Table 5-4).

Field 12 shows a specific fault code for the default equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

If you want to test the default equipment location on your screen, go to *To Test a Circuit.*

To Select a Circuit or a Range

You can select a single circuit or a range of circuits by unit type, equipment location, or by unit type and equipment location. To select by unit type and equipment location, select the unit type and then select the equipment location.

1. If you want to test all network circuits in the switch, enter `cf2` and then enter ; so fields 2 and 3 contain a dash.

   If you skip field 3 the rest of the equipment location fields will contain dashes.

2. If you want to select by unit type, choose from the following:

   • If you do not know the unit type, enter `nu` until the unit type you want to test appears.

     Unit types appear in numerical order.

   • Enter `cf2` and then enter the unit type in field 2.

If you select unit type 27 (general purpose port) in a universal module, or if the range you choose contains unit type 27, all translated peripherals that are not connected or not supplied with power and turned on, will fail with specific fault code 351 or 359.

If you select unit type 44 (attendant console interface circuits) or if the range you test includes unit type 44, and the headsets or handsets are plugged in, the circuits will fail.

CAUTION

If you select a range that includes unit type 45 (auxiliary trunks) in a traditional module, all one-way incoming and one-way outgoing auxiliary trunks will fail with specific fault code 316. You must test these auxiliary trunks singly.

The switch tests all digital network circuits with the unit type you selected.

3. If you want to test all network circuits in a module, enter `cf3` and enter the module number in field 3.

    The switch tests all digital network circuits in the module you selected. If you also selected a unit type, the switch tests all digital network circuits in the module with the unit type you selected.

4. If you want to test all network circuits in a cabinet, enter `cf3` and enter the module and cabinet in fields 3 and 4.

    The switch tests all digital network circuits in the cabinet you selected. If you selected a unit type, the switch tests all digital network circuits in the cabinet with the unit type you selected.

5. If you want to test all network circuits in a carrier, enter `cf3` and enter the module, cabinet, and carrier.

    The switch tests all digital network circuits in the carrier you selected. If you selected a unit type, the switch tests all digital network circuits in the carrier with the unit type you selected.

6. If you want to test all network circuits in a slot, enter `cf3` and then enter the module, cabinet, carrier, and slot.

    The switch tests all circuits on the circuit pack in the slot you selected. If you selected a circuit pack that has only one circuit, the switch tests that circuit.

7. If you want to select a specific circuit, choose from the following:

    ● Enter a unit type or a partial equipment location and then, enter `nc` until the circuit you want to test appears in fields 3-7.

    ● If a circuit is already on your screen, enter `cf3` and then enter the module, carrier, slot, and circuit.

    The switch tests the circuit you selected

8. If you selected unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, 72 or 78 (port circuits), or if the range you selected includes these port circuits, go to *To Busy Out a Port.*

9. If you selected a single circuit, go to *To Test a Circuit.*

10. If you selected a range of circuits, go to *To Test a Range of Circuits.*

To Busy Out a Port

1. Make sure that you have selected a circuit to busy out.

   If you selected unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, 72 or 78 (port circuits), or if the range you selected includes these port circuits, the switch tests all idle or maintenance busy port circuits first. After all idle and maintenance busy circuits are tested the switch returns to circuits that were in use and waits until the circuit is not in use. The switch will try to test the circuit until you stop the test. If the port circuit is on-line and in use, the switch skips it. If you must test one of these circuits, test it by itself instead of in a range. If you want to ensure that the switch tests a circuit that may be in use, busy out the circuit.

   If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

   ⚠ CAUTION   If you busy out unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, or 72 while they are in use (field 10 contains a 1), there is a loss of service in the switch. Voice and data calls may be lost.

   ⚠ CAUTION   If you busy out a DS1, RCG, or ISDN PRI circuit pack (unit types 68, 74, or 75), you will disrupt calls in progress on all 24 ports of the DS1, RCG, or ISDN PRI circuit pack.

2. Enter bo to busy out the circuit on your screen.

      Field 10 contains a 3 (see Table 54).

   If the switch cannot busy out a circuit in a unit type, special error code 80 appears in the message line on your screen.

3. If the circuit status in field 10 equals 4 and you are at the switch site, install the correct circuit pack.

   If you are not at the switch site, you cannot test this port.

   If field 10 still contains a 4, refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) for the correct repair procedures.

4. If you selected a single circuit, go to *To Test a Circuit.*

5. If you selected a range, go to *To Test a Range of Circuits.*

To Test a Circuit

1. Make sure that you have selected a circuit to test.

    If you have not selected a circuit, go to *To Select a Circuit or Range.*

2. Enter x to test a circuit.

    WAIT appears on your screen.

    When the test is done, WAIT disappears from your screen.

    > Fields 2 shows the unit type (see Table 5-l).

    > Fields 3-7 show the equipment location.

    > Field 8 shows the location status (see Table 5-2).

    > Field 9 shows the alarm status (see Table 5-3).

    > Field 10 shows the circuit status (see Table 5-4).

    > Field 13 contains a 1.

    > Field 14 contains a 0 if the test passed or a 1 if the circuit failed.

3. Enter nc to see the specific fault code recorded for the failure.

    > Field 12 shows the specific fault code. Record this number.

    If you enter nc again, the switch dashes fields 2-14. If you enter nc again, the failure summary appears.

4. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for the unit type on your screen.

    After you repair a failure, the switch marks the network circuit alarm resolved. The switch turns off **MAJOR, MINOR, WARNING, SWITCH** or **PORT** on the common-control alarm panel if there is no other reason for them to be on.

5. If you busied out the circuit and the test passes, enter rb to release the circuit from busy.

    If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end, you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

6. If you want to test another circuit, go to *To Select a Circuit or a Range.*

7. If you want to examine the network failure history log, go to test 1.

8. If you want to test a circuit or a range of circuits continuously, go to test 3.

9. If you want to do a diagnostic test, go to test 4.

10. If you want to do a verification test, go to test 5.

To Test a Range of Circuits

1. Make sure that you have selected a range of circuits to test.

    If you have not selected a range of circuits, go to *To Select a Circuit or Range.*

2. Enter x to test a range of circuits.

    WAIT appears on your screen.

    The following fields may change as the switch tests each circuit in the range.

    > Field 2 shows the unit type (see Table 5-l).

    > Fields 3-7 show the equipment location the switch is testing.

    > Field 11 shows which fault type you are viewing and contains a 1.

    > Field 12 shows the specific fault code. Record this number.

    > Field 13 shows the number of circuits tested.

    > Field 14 shows the number of circuits that failed.

    If the switch cannot test a circuit because switch resources are not available, special error code 83 appears in the message line. The switch stores a fault code in DMIDS and tests the next circuit. If DMIDS fills up, the test stops. Special error code 84 appears in the message line. You can enter x to start the test again, enter nc to see each failure, or select a new range.

    If the switch finds a circuit in use, IN USE appears on your screen. The switch stores all in-use circuits for later testing. After the switch tests the range once, it tries to test any circuits that were in use. If a circuit is still in-use by call processing, IN USE appears and stays on. Fields 11-14 do not change or change slowly.

    The switch tries to test all in-use circuits until it tests the range or until you enter s

    If you want to stop the test before the range is completely tested, enter s

    WAIT disappears from your screen. Special error code 82 appears in the message line.

    > Field 2 shows the unit type (see Table 5-l).

    > Fields 3-7 show the last equipment location the switch tested.

    > Field 8 shows the location status (see Table 5-2).

    > Field 9 shows the alarm status (see Table 5-3).

    > Field 10 shows the circuit status (see Table 5-4).

    > Field 13 shows the number of circuits tested.

    > Field 14 shows the number of circuits that failed.

    You can enter x to start the test again, or select a new range.

    If you start the test again the switch tests the range from where the test stopped. If circuits are still in-use, the switch keeps all in-use circuits in the list of failed circuits and marks them with specific fault code of 13. The switch adds new test results to the previous test results.

After the switch tests all circuits in the range, WAIT disappears from your screen.

> Fields 2-6 show the range you selected.

> Field 13 shows the number of circuits tested.

> Field 14 shows the total number of failures. If there are no failures, field 14 contains a 0.

3. Enter nc to see each failure.

> Field 2 shows the unit type (see Table 5-l).

> Fields 3-7 show the equipment location.

> Field 8 shows the location status (see Table 5-2).

> Field 9 shows the alarm status (see Table 5-3).

> Field 10 shows the circuit status (see Table 5-4).

> Field 11 shows which fault type you are viewing and contains a 1.

> Field 12 shows the specific fault code. Record this number. If any circuits were in use field 12 contains a 13.

> Field 13 shows the number of circuits tested.

> Field 14 shows the number of circuits that failed. The number in field 14 decreases by one as you view each failure.

4. If you tested more than one unit type and want to view failures for other unit types, enter nu

   The first failure for the next numerical unit type in the range you selected appears.

   The number infield 14 decreases by the number of failures you skipped.

   After you view all failures, the switch dashes fields 2-14. If you enter nu again, the summary appears.

5. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for the unit type on your screen.

   When you repair a failure, the switch marks the network circuit alarm resolved. The switch turns off **MAJOR, MINOR, WARNING, SWITCH** or **PORT** on the common-control alarm panel if there is no other reason for them to be on.

6. If you busied out the circuit and the test passes, enter rb to release the circuit from busy.

   If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

7. If there are more failures repeat steps 3-7.

   After you view all failures, the switch dashes fields 2-14. If you enter nc again, the summary appears.

8. If you want to select a new range, go to *To Select a Circuit or a Range.*

Test 3 - Operation

Use test 3 to test a circuit or a range of digital network circuits continually when you suspect that there is an intermittent fault, to trace wiring problems, or to isolate problems.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - If you are not in the procedure, enter p620

   - If you are already in the procedure, but not in test 3, enter t3

   The test 3 screen, similar to the following, appears.

```
 ┌──────────────────────────────────────────────────────────────────┐
 │            ENHANCED  MODE  -  PROCEDURE:  620,  TEST:  3           │
 │              CONTINUOUSLY  TEST  NETWORK  CIRCUITS                 │
 │                                                                    │
 │  2. Unit Type: ⬚                                                   │
 │                                                                    │
 │  EQUIPMENT LOCATION              FAILURE  SUMMARY                  │
 │     3.    Module: ⬚                13. Number of Circuits Tested: ⬚ │
 │     4.   Cabinet: ⬚                14.      Number of Failures: ⬚  │
 │     5.   Carrier: ⬚                                                │
 │     6.      Slot: ⬚                                                │
 │     7.   Circuit: ⬚                                                │
 │                                                                    │
 │  STATUS                                                            │
 │     8. Location Status: ⬚                                          │
 │     9.    Alarm Status: ⬚                                          │
 │    10.  Circuit Status: ⬚                                          │
 │                                                                    │
 │  FAULT                                                             │
 │    11.      Failure Index: ⬚                                       │
 │    12. Specific Fault Code: ⬚                                      │
 │                                                                    │
 │  Connected to CC0 ON-LINE ♥ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ] │
 │                                                                    │
 ├──────────────────────────────────────────────────────────────────┤
 │ enter command: ▬                                                   │
 │ [_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS] │
 └──────────────────────────────────────────────────────────────────┘
```

The switch highlights field 2.

Fields 2-7 may contain a default unit type and equipment location from test 1, 2, 4, or 5, from Procedure 600 Test 1 or 2, or from Procedures 621, 622, 625, 646, 647, or 648.

Field 8 shows the location status of the default equipment location (see Table 5-2).

Field 9 shows the alarm status of the default equipment location (see Table 5-3).

Field 10 shows the circuit status of the default equipment location (see Table 5-4).

Field 12 shows the specific fault code of the default equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

2. If you want to test the default equipment location on your screen go to *To Test a Circuit Continuously.*

To Select a Circuit or a Range

You can select a single circuit or a range of circuits by unit type, equipment location, or by unit type and equipment location. To select by unit type and equipment location select the unit type and then select the equipment location.

1. If you want to test all network circuits in the switch, enter `cf2` and then enter ; to dash fields 2 and 3 .

   If you skip field 3 the rest of the of the equipment location fields will contain dashes.

2. If you want to select by unit type choose from the following:

   - If you do not know the unit type, enter `nu` until the unit type you want to test appears.

     Unit types appear in numerical order.

   - Enter `cf2` and then enter the unit type in field 2.

   ⚠️ **CAUTION** If you select unit type 27 (general purpose port) in a universal module, or if the range you choose contains unit type 27, all translated peripherals that are not connected or not supplied with power and turned on, will fail with specific fault code 351 or 359.

   ⚠️ **CAUTION** If you select unit type 44 (attendant console interface circuits) or if the range you test includes unit type 44, and the headsets or handsets are plugged in, the circuits will fail.

CAUTION If you select a range that includes unit type 45 (auxiliary trunks) in a traditional module, all one-way incoming and one-way outgoing auxiliary trunks will fail with specific fault code 316. You must test these auxiliary trunks singly.

The switch tests all digital network circuits with the unit type you selected.

3. If you want to test all network circuits in a module, enter `cf3` and enter the module number in field 3.

    The switch tests all digital network circuits in the module you selected. If you also selected a unit type the switch tests all digital network circuits in the module with the unit type you selected.

4. If you want to test all network circuits in a cabinet, enter `cf3` and enter the module and cabinet in fields 3 and 4.

    The switch tests all digital network circuits in the cabinet you selected. If you selected a unit type the switch tests all digital network circuits in the cabinet with the unit type you selected.

5. If you want to test all network circuits in a carrier, enter `cf3` and enter the module, cabinet, and carrier.

    The switch tests all digital network circuits in the carrier you selected. If you selected a unit type the switch tests all digital network circuits in the carrier with the unit type you selected.

6. If you want to test all network circuits in a slot, enter `cf3` and then enter the module, cabinet, carrier, and slot.

    The switch tests all circuits on the circuit pack in the slot you selected. If you selected a circuit pack that has only one circuit the switch tests that circuit.

7. If you want to select a specific circuit choose from the following:

    • Enter a unit type or a partial equipment location and then, enter `nc` until the circuit you want to test appears in fields 3-7.

    • If a circuit is already on your screen, enter `cf3` and then enter the module, cabinet, carrier, slot, and circuit.

    The switch tests the circuit you selected.

8. If you selected unit types 16, 24, 25, 27-29,31-34, 44-46, 62, 66, 69, 71, 72 or 78 (port circuits), or if the range you selected includes these port circuits, go to *To Busy Out a Port.*

9. If you selected a single circuit, go to *To Test a Circuit Continuously.*

10. If you selected a range of circuits, go to *To Test a Range of Circuits Continuously.*

To Busy Out a Port

1. Make sure that you have selected a circuit to busy out.

   If you selected unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, 72, or 78 (port circuits), or if the range you selected includes these port circuits, the switch tests all idle or maintenance busy port circuits first. If the port circuit is on-line and in use, the switch skips it. If you must test one of these circuits, test it by itself instead of in a range. If you want to ensure that the switch tests a circuit that may be in use, busy out the circuit.

If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

CAUTION — If you busy out unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, or 72 while they are in use (field 10 contains a 1), there is a loss of service in the switch. Voice and data calls may be lost.

CAUTION — If you busy out a DS1, RCG, or ISDN PRI circuit pack (unit types 68,74, or 75), you will disrupt calls in progress on all 24 ports of the DS1, RCG, or ISDN PRI circuit pack.

2.   Enter bo to busy out the circuit on your screen.

    Field 10 contains a 3 (see Table 5-4).

If the switch cannot busy out a circuit in a unit type, special error code 80 appears in the message line on your screen.

3.   If the circuit status in field 10 equals 4 and you are at the switch site, install the correct circuit pack.

    If field 10 still contains a 4 , refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) for the correct repair procedures.

    If you are not at the switch site, you cannot test this port.

4.   If you selected a single circuit, go to *To Test a Circuit Continuously.*

5.   If you selected a range, go to *To Test a Range of Circuits Continuously.*

To Test a Circuit Continuously

1. Make sure that you have selected a circuit to test.

   If you have not selected a circuit, go to *To Select a Circuit or a Range.*

2. Enter x to test the circuit continuously.

3. Enter s to stop the test.

   > Fields 2-7 show the original circuit you selected.

   > Field 13 shows the number of times tested.

   > Field 14 shows the number of times the circuit failed. If there are no failures, field 14 contains a 0.

4. Enter nc to see each specific fault code for the circuit that failed.

   > Field 2 shows the unit type (see Table 5-l).

   > Fields 3-7 show the equipment location.

   > Field 8 shows the location status (see Table 5-2).

   > Field 9 shows the alarm status (see Table 5-3).

   > Field 10 shows the circuit status (see Table 5-4).

   > Field 11 shows the failure type you are viewing and contains a 1.

   > Field 12 shows the specific fault code logged against the failure. Record this number.

   > Field 13 shows the number of times tested.

   > Field 14 shows the number of times the circuit failed.

   After you view all specific fault codes, the switch dashes fields 2-14. If you enter nc again, the failure summary appears.

5. If field 14 contains a number other than one, enter nf to see if there are other fault information lists.

   Each fault information list shows the number of failures with different specific fault codes. If all failures have the same specific fault code, only one fault list appears.

   > Field 12 may show other specific fault codes logged against the failure. Record all specific fault codes.

   After you view all fault information lists, the switch dashes fields 11-14. If you enter nf again, the failure summary appears.

6. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair the problem.

7. If you busied out the circuit and the test passes, enter rb to release the circuit from busy.

   If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released form busy at both ends.

8. If you want to examine the digital network failure history log, go to test 1.

9. If you want to test a circuit or a range once, go to test 2.

10. If you want to do a diagnostic test, go to test 4.

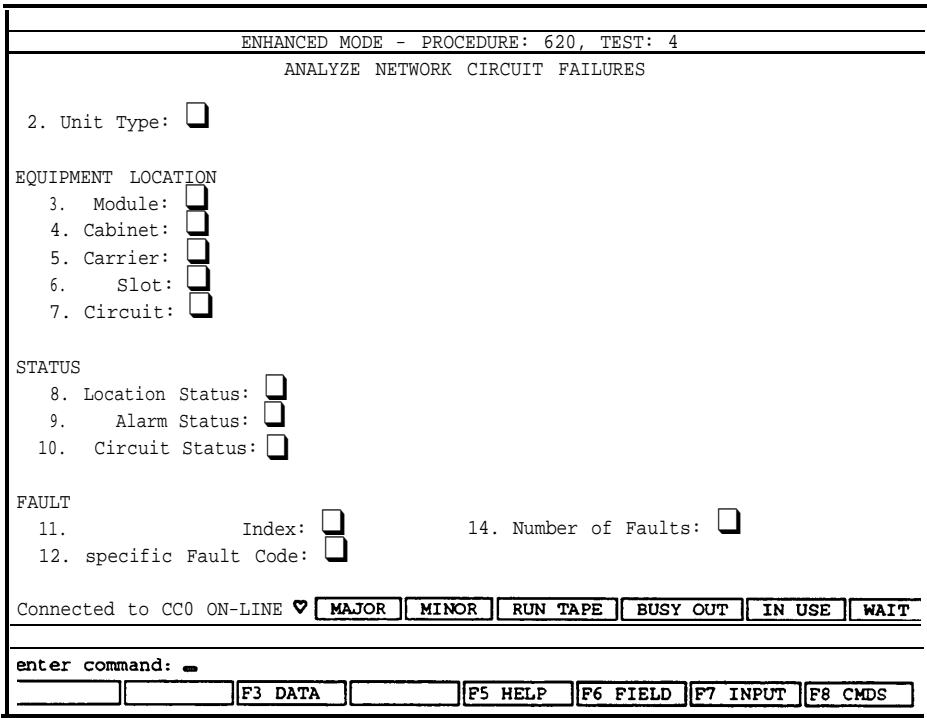11. If you want to do a verification test, go to test 5.

To Test a Range of Circuits Continuously

1. Make sure that you have selected a range of circuits to test.

   If you have not selected a range, go to *To Select a Circuit or a Range.*

2. Enter x to test a range of circuits continuously.

   The numbers in the following fields may change as the switch tests each circuit in the range.

   > Field 2 shows the unit type (see Table 5-l).

   > Fields 3-7 show the equipment location. If the switch is testing a range of circuits for a unit type that contains only one circuit pack, fields 2-7 may not change.

   > Field 11 shows the index.

   > Field 12 shows the specific fault code. Record this number.

   > Field 13 shows the number of circuits tested.

   > Field 14 shows the number of failures.

   The switch stores each failure in DMIDS. If DMIDS fills up, the test stops. Special error code 84 appears in the message line and fields 2-7 show the last equipment location the switch tested. If you want to continue the test from where it stopped, repeat step 2. If you want to select a new circuit, go to *To Select a Circuit or a Range.*
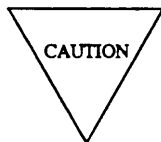
    CAUTION   Examine and record all failures before you start the test again. If you continue the test, test results stored in DMIDS are lost.

   After the switch tests the range once, it tests the range over until you enters s. The switch stores the first failure of a circuit in DMIDS. Even if a circuit fails with a different specific fault code, the first failure is the only failure stored in DMIDS.

   > Field 13 shows the number of circuits in the range. Note that field 13 is not updated after the first test of the range.

3. Enter `s` to stop the test.

> Fields 2-7 show the original range you selected.

> Field 13 shows the number of circuits tested.

> Field 14 shows the number of circuits with failures.

4. Enter `nc` to see each failure.

> Field 2 shows the unit type (see Table 5-1).

> Fields 3-7 shows the equipment location.

> Field 8 shows the location status (see Table 5-2).

> Field 9 shows the alarm status (see Table 5-3).

> Field 10 shows the circuit status (see Table 5-4).

> Field 11 shows the failure index and contains a 1.

> Field 12 shows the specific fault code. Record this number.

> Field 13 shows the number of circuits tested.

> Field 14 shows the number of circuits that failed.

5. If you test more than one unit type and want to view failures for other unit types, enter `nu`

   The first failure for the next numerical unit type appears. The number in field 14 decreases by the number of failures you skipped.

   After you view all unit types with failures, the switch dashes fields 2-14. If you enter `nu` again, the original range you selected appears.

6. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair the problem.

   After you resolve all failures, network circuit alarmed entries in PMIDS are marked resolved. The switch turns off **MAJOR, MINOR, WARNING, SWITCH,** or **PORT** on the common-control alarm panel if there is no other reason for them to be on. Network circuit alarmed failures in PMIDS are marked resolved.

7. If this is not the last circuit with failures repeat steps 4-7.

   After you view all failures, the switch dashes fields 2-14. If you enter `nc` again, the original range - you selected appears.

8. If you want to test another range, go to *To Select a Circuit or Range.*

9. If you want to examine the digital network failure history log, go to test 1.

10. If you want to test a circuit or a range once, go to test 2.

11. If you want to do a diagnostic test, go to test 4.

12. If you want to do a verification test, go to test 5.

Test 4 - Operation

Use test 4 to diagnose circuit problems.   The switch tests the faulty circuit you selected and tries to diagnose the problem. If the circuit pack you selected passes but the test fails when testing the circuits that interface to the circuit pack, the test progresses to the next circuit pack. If there is more than one possible reason for failure, the switch gives a recommended sequence for circuit pack replacement.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following.

   - If you are not in the procedure, enter p620

   - If you are already in the procedure, but not in test 4, enter t4

     The test 4 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 620, TEST: 4
               ANALYZE NETWORK CIRCUIT FAILURES

 2. Unit Type: ▢

EQUIPMENT LOCATION
    3.   Module: ▢
    4.  Cabinet: ▢
    5.  Carrier: ▢
    6.     Slot: ▢
    7.  Circuit: ▢

STATUS
    8. Location Status: ▢
    9.    Alarm Status: ▢
   10.  Circuit Status: ▢

FAULT
   11.           Index: ▢          14. Number of Faults: ▢
   12. specific Fault Code: ▢

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

The switch highlights field 2.

Fields 2-7 may contain a default equipment location and unit type from test 1, 2, 3, or 5, from Procedure 600 Test 1 or 2, or from Procedures 621, 622, 625, 646, 647, or 648.

Field 8 shows the location status of the default equipment location (see Table 5-2).

Field 9 shows the alarm status of the default equipment location (see Table 5-3).

Field 10 shows the circuit status of the default equipment location (see Table 5-4).

Field 12 may show the specific fault code of the default equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Circuit

You can select by unit type, by equipment location or by both unit type and equipment location. To select by unit type and equipment location enter the unit type and equipment location. If you enter the equipment location and do not enter the unit type the unit type appears.

1. If you want to select by unit type choose from the following:

   ● If you do not know the unit type, enter nu until the unit type you want to test appears.

   Unit types appear in numerical order.

   ● Enter cf2 and then enter the unit type in field 2.

If you select unit type 27 (general purpose port) in a universal module, or if the range you choose contains unit type 27, all translated peripherals that are not connected or not supplied with power and turned on, will fail with specific fault code 351 or 359.

If you select unit type 44 (attendant console interface circuits) or if the range you test includes unit type 44, and the headsets or handsets are plugged in, the circuits will fail.

If you select a range that includes unit type 45 (auxiliary trunks) in a traditional module, all one-way incoming and one-way outgoing auxiliary trunks will fail with specific fault code 316. You must test these auxiliary trunks singly.

The switch tests all digital network circuits with the unit type you selected.

2. To select by equipment location choose from the following:

   - Enter the unit type and then enter nc until the equipment location you want to test appears.

   - Enter cf3 and then enter the equipment location.

   The switch automatically busies out circuits on unit type 68 (DSl), unit type 74 (RCG), or unit type 75 (ISDN PRI) circuit packs if the circuits are not in use. Any unit type 68, unit type 74, or unit type 75 circuit that is in use is not tested. If the circuit is in use, specific fault code 13 appears.

3. If you want to busy out a port, go to *To Busy Out a Port.*

4. To test the circuit you selected, go to *To Do a Diagnostic Test.*

To Busy Out a Port

1. Make sure that you have selected a circuit to busy out.

   If you try to test unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, 72, or 78 (port circuits) and if the port circuit is on-line and in use, the switch waits until the circuit is not in-use. The switch will try to test the circuit until you stop the test. If you must test this circuit, busy it out.

   If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.
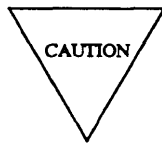
   If you busy out unit types 16, 24, 25, 27-29, 31-34, 44-46, 62, 66, 69, 71, or 72 while they are in use (field 10 contains a 1), there is a loss of service in the switch. Voice and data calls may be lost.
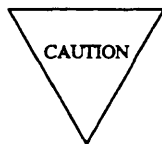
   If you busy out a DS1, remote carrier group (RCG), or ISDN PRI circuit pack (unit types 68, 74, or 75), you will disrupt calls in progress on all 24 ports of the DS1, RCG, or ISDN PRI circuit pack.

2. Enter bo to busy out the circuit on your screen.

   Field 10 contains a 3 (see Table 5-4).

   If the switch cannot busy out a circuit in a unit type, special error code 80 appears in the message line on your screen.

3. If the circuit status in field 10 equals 4 and you are at the switch site, install the comet circuit pack.

   If field 10 still contains a 4, refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair the failure.

   If you are not at the switch site, you cannot test this port.

4. Go to *To Do a Diagnostic Test.*

To Do a Diagnostic Test

Test 4 is a destructive test. All port circuits are automatically busied out. All voice and data calls on the circuit are automatically dropped.

1. Make sure that you have selected a circuit to test.

2. Enter x to do a diagnostic test, starting with the circuit you selected.

    WAIT appears on your screen. The switch turns on the green LED on the circuit pack you selected.

    It may take a up to seven minutes to diagnose a problem.

    The switch tests the circuit you selected. If the test passes, the switch leaves the green LED lit on the circuit pack. The switch then tests all interfaces to the circuit pack. When the switch finishes its diagnosis, it lights the red LED on the circuit pack it diagnoses as the cause of the problem.

    Fields 3-7 show the equipment location of the indicted circuit pack.

    Field 12 shows the specific fault code.
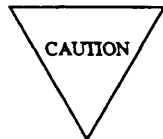
CAUTION

If the unit type is 57 (light guide interface) and specific fault codes 607, 612, 630, or 638 appear in field 12, it may take about 6 more seconds to test. It usually takes about 3 minutes to successfully test unit type 57.

    If you want to stop the test before the diagnosis is complete, enter s
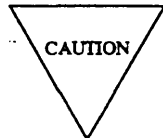
CAUTION

If you enter s any data gathered during the test is lost.

    When the switch finishes its diagnosis, WAIT disappears from your screen.

    If the test passes, the switch dashes fields 11 and 12. The switch leaves the green LED lit on the circuit pack. The switch marks the circuits alarm resolved and the problem is fixed. The switch turns off **SWITCH, PORT, MAJOR, MINOR,** and **WARNING** on the common-control alarm panel if there is no other reason for them to be on.

    If the test fails, the switch turns on the red LED on the circuit pack that it has indicted and the following appears.

Fields 2-7 show the unit type and equipment location of the circuit the switch indicted. The unit type and equipment location may not be the original circuit you selected for testing. The switch may isolate the problem to a circuit pack which interfaces with the circuit pack you selected.

Field 8 shows the location status (see Table 5-2).

Field 9 shows the alarm status (see Table 5-3).

Field 10 shows the circuit status (see Table 5-4).

Field 11 contains a `1`.

Field 12 shows the specific fault code. Record this number.

3. Replace the circuit pack the switch indicted.

    You cannot run test 4 again unless you replace the circuit pack or enter anew equipment location.

    The switch waits for you to replace the circuit pack that failed. When you replace the circuit pack that has its red LED lit, the switch automatically starts a verification test on the circuit pack you replaced. The original test, which caused a failure to be logged, is also run.
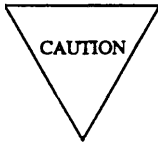
    CAUTION   When the switch does the verification test, all port circuits (except DS1, RCG, ISDN PRI, and some cases of TTR and ATTND) are automatically busied out. All voice and data calls on the port circuit packs are dropped. These circuits must be idle or they will not be tested.

    If DMIDS fills up, special error code 84 appears. The test continues but new failure information is lost.

4. If field 14 contains a number greater than 1, enter nf to see the next specific fault code.

    Field 12 shows the specific fault code. Record this number.

    After you view all specific fault codes, the switch dashes fields 2-14. If you enter `nf` again, the original specific fault code appears.

5. If the verification test fails, enter `nc` to see the alternate circuit pack to replace.

    The switch turns on the red LED on the alternate circuit pack.

    Field 2 shows the unit type (see Table 5-l).

    Fields 3-7 show the equipment location of the alternate circuit pack to replace.

    Field 12 shows the specific fault code. Record this number.

    Field 14 shows the number of specific fault codes.

    After you view all alternate circuit packs to replace, the switch dashes fields 11-14. If you enter `nc` again, the first circuit pack in the replacement sequence appears.

6. Replace the next alternate circuit pack.

The switch waits for you to replace the circuit pack that failed. When you replace the circuit pack that has its red LED lit, the switch automatically starts a verification test on the circuit pack you replaced. The original test, which caused a failure to be logged, is also run.
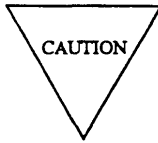
CAUTION: When the switch does a verification test, all port circuits (except DS1, RCG, ISDN PRI and some cases of TTR and ATTND) are automatically busied out. All voice and data calls on the port circuit packs are dropped. These circuits must be idle or they will not be tested.

If DMIDS fills up, special error code 84 appears. The test continues but new failure information is lost.

7. If the circuit pack you replaced fails, repeat steps 5-7.

8. If you busied out the circuit, enter `rb` to release the circuit from busy.

If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

9. If you tested unit type 45 (auxiliary trunks) in a traditional module and changed the switch settings, change them back.

10. If you want to test another circuit, go to *To Select a Circuit.*

11. If you want to examine the failure history log or resolve alarms, go to test 1.

12. If you want to test a circuit or a range of circuits, go to test 2.

13. If you want to test a circuit or a range of circuits continuously, go to test 3.

14. If you want to do a verification test, go to test 5.

Test 5 - Operation

Use test 5 to do a verification test on a specific equipment location. A verification test completely tests a circuit pack. The circuit pack either passes, fails, or indicts external hardware. The test does not stop if a failure is found but continues to look for all failures. All failures are saved and can be viewed at the end of the test.

In test 5 you can:

To View the Test 5 Screen

1. To see the test 5 screen, choose one or both of the following.

    *   If you are not in Procedure 620, enter p620
    *   If you already in the procedure but not in test 5, enter t5

        The test 5 screen similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 620, TEST: 5
                      DO A NETWORK CIRCUIT PACK VERIFICATION

   2. Unit Type: ⬚


EQUIPMENT LOCATION
   3.   Module: ⬚
   4.  Cabinet: ⬚
   5.  Carrier: ⬚
   6.     Slot: ⬚
   7.  Circuit: ⬚


STATUS
   8. Location Status: ⬚
   9.    Alarm Status: ⬚
  10.   Circuit Status: ⬚


FAULT
  11.           Index: ⬚          14. Number of Faults: ⬚
  12. Specific Fault Code: ⬚

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]


enter command: ▭
_____  _____  [F3 DATA ]  _____  [F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

The switch highlights field 2.

Fields 2-7 may contain a default equipment location and unit type.

Field 8 shows the location status of the default equipment location (see Table 5-2).

Field 9 shows the alarm status of the default equipment location (see Table 5-3).

Field 10 shows the circuit status of the default equipment location (see Table 5-4).

Field 12 may show the specific fault code of the default equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Circuit

You can select by unit type, by equipment location or by both unit type and equipment location. To select by unit type and equipment location, select by unit type, and then select the equipment location you want to test. If you enter the equipment location and do not enter the unit type the unit type appears.

1. If you want to select by unit type choose from the following:

   - If you do not know the unit type, enter `nu` until the unit type you want to test appears.

     Unit types appear in numerical order.

   - Enter `cf2` and then enter the unit type in field 2.

   CAUTION: If you select unit type 27 (general purpose port) in a universal module, or if the range you choose contains unit type 27, all translated peripherals that are not connected or not supplied with power and turned on, will fail with specific fault code 351 or 359.

   CAUTION: If you select unit type 44 (attendant console interface circuits) or if the range you test includes unit type 44, and the headsets or handsets are plugged in, the circuits will fail.

   CAUTION: If you select a range that includes unit type 45 (auxiliary trunks) in a traditional module, all one-way incoming and one-way outgoing auxiliary trunks will fail with specific fault code 316. You must test these auxiliary trunks singly.

   The switch tests all digital network circuits with the unit type you selected.

2. To select by equipment location choose from the following:

   - Enter the unit type and then enter `nc` until the equipment location you want to test appears.

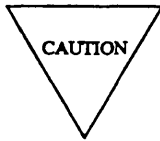● Enter `cf3` and then enter the equipment location.

The switch automatically busies out circuits on unit type 68 (DSl), unit type 74 (RCG), or unit type 75 (ISDN PRI) circuit packs if the circuits are not in use. Any unit type 68, unit type 74, or unit type 75 circuit that is in use is not tested. If the circuit is in use specific fault code 13 appears.

To Busy Out a Port

1. Make sure that you have selected a circuit to busy out.

   In test 5, all ports on a board are automatically busied out except for DS1, RCG, and ISDN PRI unit types. To test these unit types in test 5, you must manually busy out the circuit pack.

   If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

   > **CAUTION**
   >
   > If you busy out a DS1, RCG, or ISDN PRI circuit pack (unit types 68, 74, or 75), you will disrupt calls in progress on all 24 ports of the DS1, RCG, or ISDN PRI circuit pack.

2. Enter `bo` to busy out the circuit on your screen.

   Field 10 contains a 3 (see Table 5-4).

   If the switch cannot busy out a circuit in a unit type, special error code 80 appears in the message line on your screen.

3. If the circuit status in field 10 equals 4 and you are at the switch site, install the correct circuit pack.

   If field 10 still contains a 4, refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair the failure.

   If you are not at the switch site, you cannot test this port.

4. *Go to To Do a Verification Test* to test the circuit you selected.

To Do a Verification Test
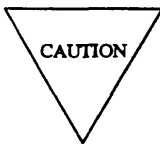
> **CAUTION**
>
> When you do a verification test, all port circuits (except DS1, RCG, ISDN PRI and some cases of TTR and ATTND) are automatically busied out. All voice and data calls on the port circuit packs are dropped. These circuits must be idle or they will not be tested.

1. Make sure that you have selected a circuit pack to test.

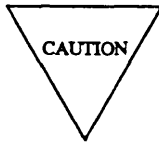Note that this test tests all circuits on the circuit pack

2. Enter x to do a verification test.

WAIT appears on your screen.

The switch turns on the green LED on the circuit pack you selected.

It may take up to eight minutes to do a verification test..

During the test, field 12 shows all specific fault codes logged against the failure.

If the unit type is 57 (light guide interface) and specific fault codes 607, 612, 630, or 638 appear in field 12, it may take about 6 more seconds, after WAIT disappears, for the test to complete. It usually takes about 3 minutes to successfully test unit type 57.

If you want to stop the test before the verification testis done, enter s
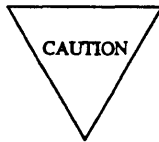
If you enter s any data gathered during the test is lost.

When the switch finishes the verification test, WAIT disappears from your screen.

If DMIDS fills up the test continues, but new failures are not recorded.

If the test passes, the switch leaves the green LED lit on the circuit pack. The switch marks the circuits alarm resolved and the problem is fixed. The switch turns off **SWITCH, PORT, MAJOR, MINOR,** and **WARNING** on the common-control alarm panel if there is no other reason for them to be on.

If the test passes, the following appears.

>Field 2 shows the unit type (see Table 5-l).

>Fields 3-7 show the equipment location.

>Field 8 shows the location status (see Table 5-2).

>Field 9 shows the alarm status (see Table 5-3).

>Field 10 shows the circuit status (see Table 5-4).

>Field 12 contains a 0 if the circuit pack passes, or a 9999 if a failure is found on another circuit pack that interfaces with the circuit pack you tested or if the failure is not due to this unit type.

If the test fails, the switch lights the red LED on the circuit pack that failed.

>Field 2 shows the unit type (see Table 5-l).

>Fields 3-7 show the equipment location.

>Note that the circuit infield 7 may not be the original circuit you selected.

>Field 8 shows the location status (see Table 5-2).

>Field 9 shows the alarm status (see Table 5-3).

>Field 10 shows the circuit status (see Table 5-4).

>Field 12 shows the specific fault code. Record this number.

>Field 14 shows the number of faults.

3. Enter `nf` to view each specific fault code.

>Fields 2-7 show the unit type and equipment location of the circuit that failed.

>Field 8 shows the location status (see Table 5-2).

>Field 9 shows the alarm status (see Table 5-3).

>Field 10 shows the circuit status (see Table 5-4).

>Field 11 contains a 1.

>Field 12 shows the specific fault code. Record this number.

>Field 14 shows the number of faults.

After you view all specific fault codes, the switch dashes fields 11-14. If you enter `nf` again, the first specific fault code appears.

4. If field 12 contains a `9999,` go to test 4 and test the circuit pack that interfaces to the circuit pack you selected.

5. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair the circuit that failed.

6. If you busied out the circuit, enter `rb` to release the circuit from busy.

    If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

7. If you want to test another circuit, go to *To Select a Circuit.*

8. If you want to examine the failure history log or resolve alarms, go to test 1.

9. If you want to test a circuit or a range of circuits, go to test 2.

10. If you want to test a circuit or a range of circuits continuously, go to test 3.

11. If you want to diagnose switch failures, go to test 4.

Special Error Codes

While using Procedure 620 you may see the following special error codes.

- 80=You cannot busy out or release unit types 6-15, 23, and 26.

    This special error code appears when you try to busy out or release unit types 6-15, 23, and 26. You cannot busy out or release any circuit packs in the MCC or TMS with Procedure 620. Select another unit type.

- 81=The message transmission to the module processor failed.

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- 82=The switch did not completely test the range. Select a new range or enter x to continue.

    Select a new range or enter x to continue testing the range.

- 83=Switch resources are not available, try again.

    The switch is too busy to handle your command right now. Wait until the switch is not so busy and try again.

- 84=DMIDS overflow.

    There are more failures than DMIDS can hold. All new failure information is lost.

- 85=Nonnetwork equipment specification.

    You selected an equipment location that is not part of the digital network. Select another equipment location or another procedure to test the equipment location on your screen.

- 86=No circuit of this type in the range you selected.

    You tried to test a unit type that is not translated in the range you selected. Check translation or select another unit type or equipment location.

- 87=Module control switched during test. Try again.

    The module control switched during the test. You have to run the test over to get valid results.

- 88=See documentation for replacement of circuit packs.

    Refer to *DEFINITY Communications System Generic 2 Maintenance Repair Strategies* (555-104-118), Appendix A for the list of specific fault codes.

- 89=Use Procedure 627 to busy out a D-Channel.

    You tried to busy out a D-channel with Procedure 620. Go to Procedure 627 if you want to busy out a D-channel.

- 90=Test passed, see documentation.

    The test passes but something else failed. Go to *DEFINITY Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and repair.

TABLE 5-1

Field 2 Unit Type		
	Traditional	**Universal**
6 = MCC (Module control channel)	TN401	TN588
7 = TMS/MP (Time Multiplex Switch or Module Processor)	TN380 or TN381	TN580
8 = Maintenance interface	TN444B	TN444B
9 = Module clock	TN460C	TN460C
10 = TSI ALU	TN446	TN446
11 = TSI PSTORE	TN445	TN445
12 = I/O bus interface	TN400B	Not Applicable
13 = Port data store	TN440	Not Applicable
14 = PCI (Port control interface)	TN452	Not Applicable
15 = Port data interface	TN454	Not Applicable
16 = Tone plant	SN250	TN768
23 = TMS/Network duplication	TN530	TN541
24 = TT sender	SN252	TN748
25 = TT receiver	SN251	TN748
26	Not Applicable	Not Applicable
27 = GPP (General purpose port)	SN270 or SN271	TN754
28 = 72 Series (MFET) port	SN224	TN735
29 = Line circuit	SN228 or SN229	TN742 or TN746
31 = Auxiliary tone plant	SN253	TN768
32 = Co trunk	SN230	TN747B
33 = DID trunk	SN232	TN753
34 = TIE trunk/data port	SN233 or SN243	TN760
44 = Attendant console interface	SN253	TN760
45 = Auxiliary trunk	SN231	TN763
46 = Attendant con conference	SN254	Not Applicable
50 = TMS clock oscillator	TN461	TN461
51 = Local clock termination	TN462	TN462
52 = System clock synchronize	TN463	TN463
53 = Multiplexer	TN470	TN470
54 = Fan out	TN473	TN473
55 = Module interface	TN480	TN480
56 = Intermodule data store	TN441	TN441
57 = Light guide interface	TN481	TN481
58 = Fan in	UN150	UN150
59 = TMS maintenance interface	TN482	TN482
62 = ADFTC (Analog digital facility test) or MTCP (Maintenance Test Circuit Pack)	SN261	Not Applicable
66 = Tone detector 2	SN255	TN748
68 = DS1	ANN11	TN767
69 = MFAT	ANN17	TN762
71 = RMI (Remote module interface)	TN456	TN456
72 = EIA	SN238	TN726
74 = RCG (Remote Carrier Group)	ANN15/ANN16	Not Applicable
75 = PRI (Primary Rate Interface)	ANN35	TN761 and TN555
78 = BRI (Basic Rate Interface)	Not Applicable	TN556
80 = UBI (Universal Bus Interface)	Not Applicable	UN154
83 = NPE (Network Processing Element)	Not Applicable	Not Applicable
98 = TMSF	Not Applicable	Not Applicable
99 = TSI	Not Applicable	Not Applicable

Procedure Fields

The fields listed below are data entry fields.

- In tests 2-5 you can select a unit type in field 2.

- In tests 2-5 you can select an equipment location in fields 3-7.

The meaning of the fields are:

2.	Unit Type	Shows the unit type of the network circuit on your screen. Table 5-1 shows the unit type encodes.
3-7.	EQUIPMENT LOCATION	Shows the equipment location of the network circuit.
8.	Location Status	Shows whether the circuit is directly or remotely connected. Remote circuits in a remote carrier group can be physically located up to 100 miles from the carrier you are testing. This field may show that a circuit is located in a remote carrier group. A remote carrier group is not a remote module.
		Table 5-2 shows the location status encodes.
9.	Alarm Status	Shows the alarm status of the circuit on your screen. Table 5-3 shows the alarm status encodes.
10.	Circuit Status	Shows the circuit status of the circuit. Table 5-4 shows the circuit status encodes.
11.	Failure Index or Fault Index	Shows what data field 12 contains.
12.	Specific Fault Code	Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.
13-14.	FAILURE SUMMARY	Field 13 shows the number of circuits tested when you test a range or the total number of times tested. Field 14 shows the number of circuits that failed when you test a range, the number of times a circuit failed when you select a single circuit, or the failure list index for a single circuit.

TABLE 5-2

Field 8 Location Status
0   =   Local
1   =   Remote T1
2   =   Remote fiber

TABLE 5-3

Field 9 Alarm Status
0   =   No errors recorded
1   =   Major
2   =   Minor
3   =   Warning
4   =   Errors recorded
5   =   Alarm resolved

TABLE 5-4

Field 10 Circuit Status
0   =   Idle
1   =   On-line and in use
2   =   Off-line
3   =   Maintenance busy
4   =   Not plugged in or unable to communicate
5   =   Board-idle with some pints maintenance busy

PROCEDURE 621 - NETWORK DUPLICATION TESTS

Purpose

Use Procedure 621 to examine the network time multiplexed switch (TMS) or module-control carrier (MCC) duplication channels switch history log to clear switches from the history log, to test the TMS or MCC, and to do a hard or soft switch between TMS or module control carriers, to initialize the TMS or MCC, or to lock the module control on-line.

Tests

Procedure 621 has five tests.

- Use test 1 to examine the TMS or MCC switch history log and to clear switches from the log.
- Use test 2 to soft switch between TMS or module-control carriers or to prevent a soft switch by soft locking the off-line TMS or MCC.
- Use test 3 to do a hard switch between TMS or module-control carriers.
- Use test 4 to initialize the TMS or MCC.
- Use test 5 to attempt to download firmware to downloadable Universal Module Processor.

Procedure Overview

A switch may have a duplicated time multiplexed switch (TMS) or duplicated module-control carrier (MCC). The TMS is a digital switching unit that completes voice and data connections between modules. The MCC connects the module ports to each other or to the TMS, supervises the module ports, and relays commands from the common control to the ports.

If there is a problem with the on-line TMS or MCC, the off-line TMS or MCC may switch on-line. The switch also periodically switches between the on-line and off-line TMS and MCC to ensure that they both work.

Use test 1 to find why the TMS or MCC switched. Use test 2 to do a soft switch between the on-line and off-line TMS or module control, or to disable a soft switch while working on the network A soft switch does not effect voice calls or data calls. You can only do a hard or soft switch from the on-line TMS or MCC. You cannot do a soft switch if the off-line TMS or MCC is not as healthy as the on-line TMS or MCC. If there are problems in the TMS or MCC, the module health can affect the soft switch of modules. The TN481 (light guide interface) in the MCC effects the soft switch of the TMS but not a module soft switch.

Use test 3 to do a hard switch between the on-line and off-line TMS or module control. A hard switch momentarily interrupts voice and data calls in the network.

Use test 4 to initialize the TMS or MCC. If the green LED on the TN380 or TN580 (module processor) or TN381 (TMS processor) is not flashing (no heartbeat) or if the red LED is on, you should initialize the module processor or TMS processor. If the health code indicates the control carrier is shutdown or if the TMS or MCC fails Procedure 620, initialize the TMS or MCC.

Use test 5 to attempt to download firmware to a downloadable Universal Module Processor (the TN590 which replaces the TN580).

Use the following flowchart to guide you from test to test. You may want to remove it and refer to it as you use this procedure.
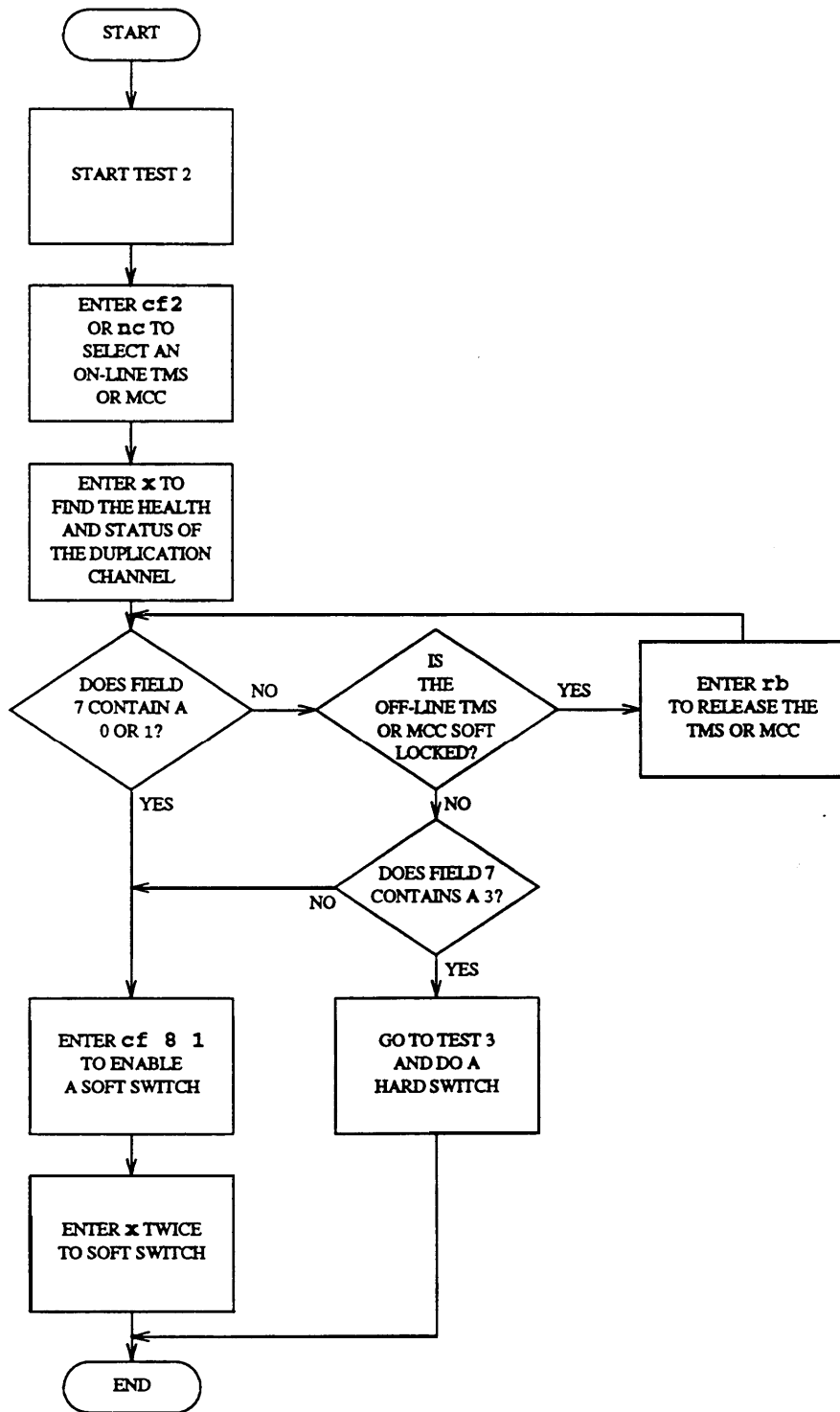
Figure 5-2. To Soft Switch Between TMS or Module Control Carriers

Test 1- Operation

Use test 1 to examine the TMS or MCC switch history log and to clear switches from the log.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen choose from the following:

    - If you are already in the procedure, but not in test 1, enter `tl`

    - Otherwise, enter `p621`

      If the TMS or MCC is not duplicated, special error code 84 appears in the message line.

      The test 1 screen, similar to the following, appears.

```
                   ENHANCED MODE - PROCEDURE: 621, TEST: 1
                 EXAMINE DUPLICATED NETWORK SWITCHOVER HISTORY LOG


 2. Equipment Type: ❏
EQUIPMENT LOCATION
   3.   Module: ❏
   4. Cabinet: ❏
   5. Carrier: ❏

 6. On-line Status: ❏
15.   Switch Index: ❏


TIME SWITCHED ON LINE
  16.    Day: ❏
  17.   Hour: ❏
  18. Minute: ❏


SWITCH CAUSE
  19. Switch Type: ❏
  20.   Unit Type: ❏


Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT


enter command: ▬
|        ||       || F3 DATA ||       ||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

Field 2 contains a 1 (see Table 5-10).

Fields 2-5 may show the default equipment location from Tests 2, 3, or 4, Procedure 600, or Procedure 620.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the TMS or MCC Switch History Log

1. To select a TMS or MCC choose from the following:
   - Enter nu until the equipment type you want to test appears, and then enter nc until the equipment location of the duplication channel you want appears.
   - Enter cf2 and enter the equipment type and module number of the TMS or MCC you want to test.

2. Enter x to sort the switch history log.

   Field 2 shows the equipment type (see Table 5-10).

   Fields 3-5 show the equipment location of the TMS or MCC.

   Field 15 shows the number of TMS or MCC switches in the log (the switch summary). If there are no TMS or MCC switches field 15 contains a 0.

3. Enter nc to see when the last hard or soft switch occurred.

   Field 2 shows the equipment type (see Table 5-10).

   Fields 3-5 show the TMS or MCC equipment location.

   Field 6 shows the on-line status when the switch occurred (see Table 5-6).

   Field 15 shows the number of hard or soft switched, up to 7.

   Fields 16-18 show when the last hard or soft switch occurred.

   Field 19 shows the switchover type (see Table 5-9).

   Field 20 shows the unit type that caused the hard or soft switch (see Table 5-10).

4. Enter nd to see other hard or soft switches in the log.

   Field 15 shows which hard or soft switch you are viewing. The number in field 15 decreases by one as you view each hard or soft switch.

   Fields 16-18 show when the hard or soft switch occurred.

   Fields 19 shows the switchover type (see Table 5-9).

   Field 20 show the unit type that caused the hard or soft switch (see Table 5-10).

5. Enter nu to switch between the TMS and MCC switch history logs.

6. If this is not the last hard or soft switch, repeat steps 3-6.

   After you view all switches, the switch dashes fields 7-20. If you enter nd again, the next most recent hard or soft switch appears.
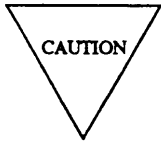
7. If you want to clear switch history from the log, go to *To Clear Switches.*

8. If you want to do a soft switch, go to test 2.

9. If you want to do a hard switch, go to test 3.

10. If you want to initialize the TMS or MCC, go to test 4.

To Clear Switches

You may want to clear switches from the log if there are any invalid entries.

1. To clear the last seven switches for the duplication channel on your screen, make sure that the hard or soft switch summary is on your screen.

   If the switch summary is not on your screen, enter x

Record all hard and soft switchovers, and their time stamps, before you clear them. Then you will have switchover history you can use for future trouble shooting.

2. Enter cdx to clear the last seven switches from the switchover history log.

   The switch dashes fields 15-20. The switch does not clear switches recorded in the off-line TMS or MCC.

3. If you want to do a soft switch, go to test 2.

4. If you want to do a hard switch, go to test 3.

5. If you want to initialize the TMS or MCC, go to test 4.

Test 2 - Operation

Use test 2 to soft switch between TMS or module-control carriers or to prevent a soft switch by soft locking the off-line TMS or MCC.

In test 2 you can:

View the test 2 screen	*page 5-49*
Soft switch between TMS or module-control carriers	*page 5-50*
Soft lock the TMS or MCC	*page 5-52*

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following:

   ● To start the procedure, enter p621

   ● If you are already in the procedure, but not in test 2, enter t2

   If the TMS or MCC is not duplicated, special error code 84 appears in the message line. Otherwise, the test 2 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE:  621, TEST:  2
        SOFT SWITCH BETWEEN DUPLICATED TMS OR MODULE CONTROL CARRIERS


2. Equipment Type: ▢


EQUIPMENT LOCATION                        HEALTH STATUS
  3.   Module: ▢                            9.        cc: ▢
  4.  Cabinet: ▢                           10. Shut Down : ▢
  5.  Carrier: ▢                           11.    Soft B: ▢
                                           12.   Soft Al: ▢
                                           13.   Soft A2 : ▢
                                           14.   Soft A3 : ▢

SWITCH STATUS
  6.    On-line Status: ▢
  7. Permission Status: ▢
  8.     Switch Status: ▢




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT

enter command: ▬
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS
```

The switch highlights field 2.

Fields 3-5 may contain a default equipment location from test 1, 3 or 4, Procedure 600, or Procedure 620.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Soft Switch Between TMS or Module Control Careers

1. If you want to select a TMS or MCC, choose from the following:

   ● Enter nu until the equipment type you want to test appears and then enter nc until the equipment location of the duplication channel you want to test appears.

   ● If you know the equipment location, enter cf2 and enter the equipment type and module number of the TMS or MCC you want to test (see Table 5-5).

2. Enter x to find the health and status of the TMS or MCC.

   Field 2 shows the equipment type (see Table 5-10).

   Fields 3-5 show the TMS or MCC equipment location.

   Field 6 shows the on-line status (see Table 5-6).

   Field 7 shows the permission status (see Table 5-7).

   Field 8 contains a 0 (see Table 5-8).

   Fields 9-14 show the health of the TMS or MCC.

3. Make sure that field 7 contains a 0 or 1.

   If Field 7 contains a 2, you cannot do a soft switch. If you must switch the TMS or MCC, go to test 3 and do a hard switch.

4. If the TMS or MCC is soft locked (field 6 contains a 1), enter rb to release the TMS or MCC from the locked condition.

   You cannot do a soft switch of the TMS or MCC if the off-line side is soft locked. If the health of the on-line side is worse than the off-line side, special error code 82 appears warning you that a hard switch may occur. If you must switch the MCC, enter rb again.

5. To enable the soft switch of the TMS or MCC, enter `cf8` and enter a 1.

Before you switch, the TMS and MCC must be working.

6. Enter `x` to start the soft switch.

Special error code 85 appears in message line.

7. Enter `x` again to do a soft switch.

`WAIT` appears on your screen.

When the test is done (in about 10 seconds), `WAIT` disappears.

If the switch is successful, the following appears.

Field 2 shows the equipment type (see Table 5-10).

Fields 3-5 show the now off-line control carrier equipment location.

Field 6 contains a 2 (see Table 5-6).

Field 7 shows the permission status (see Table 5-7).

Field 8 contains a 0 (see Table 5-8).

Fields 9-14 show the health code of the TMS or MCC.

The switch records the time and cause of the switch.

If the soft switch works but switches back, the original off-line side failed. Use Procedure 600 Test 1 to examine the original off-line TMS or MCC alarm history.

If the soft switch failed field 8 contains a 1. Special error code 80 appears in the message line. If you must switch the TMS or MCC, go to test 3 and do a hard switch.

8. If you want to examine the switch history log, or clear hard or soft switches from the log, go to test 1.

9. If you want to do a hard switch, go to test 3.

10. If you want to initialize the TMS or MCC, go to test 4.

To Soft Lock the TMS or MCC

You can soft-lock the off-line TMS or MCC while working on the off-line TMS or MCC.   The TMS or MCC may still hard switch if it is soft locked and there is a hardware failure.

You normally will soft lock the off-line TMS or MCC after you do a demand soft switch if you plan to work on the off-line TMS or MCC.

1.   To select a TMS or MCC, choose from the following:

    ● Enter nu until the equipment type you want to test appears, and then enter nc until the equipment location of the duplication channel you want to see appears.

    ● If you know the equipment location, enter cf2 and enter the equipment type and module number of the off-line TMS or MCC you want to test.

2. Enter x to find the health of the TMS or MCC.

    Field 6 shows the on-line status of the TMS or MCC (see Table 5-6).

    Fields 9 and 14 show the health of the off-line TMS or MCC.

3. Enter bo to soft lock the off-line TMS or MCC.

    Field 6 changes from a 2 to a 3 (see Table 5-6).

    BUSY OUT appears on your screen, if it is not already there.
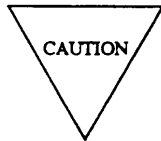
CAUTION   If you enter bo to soft lock a circuit with Procedure 621, you cannot use Procedure 635 to release the circuit from busy.

4. After you repair all problems, enter rb to release a soft-locked TMS or MCC.

    If you exit from Procedure 621 with a TMS or MCC soft locked, the TMS or MCC cannot soft switch.

5. If you want to examine the switch history log, or clear hard or soft switches, go to test 1.

6. If you want to do a hard switch, go to test 3.

7. If you want to initialize the TMS or MCC, go to test 4.

Test 3 - Operation

Use test 3 to do a hard switch between the TMS or module-control carriers.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen choose one or both of the following:

   - To start the procedure, enter p621

   - If you are already in the procedure, but not in test 3, enter t3

   If the switch translation shows that the TMS or MCC is not duplicated, special error code 84 appears in the message line. Otherwise, the test 3 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 621, TEST: 3
          HARD  SWITCH  BETWEEN  DUPLICATED  TMS  OR  MODULE  CONTROL  CARRIERS


  2. Equipment  Type: ▢


EQUIPMENT  LOCATION                          HEALTH  CODE
   3.   Module: ▢                               9.      cc: ▢
   4.  Cabinet: ▢                              10.  Shut Down: ▢
   5.  Carrier: ▢                              11.   Soft B: ▢
                                               12.  Soft Al: ▢
                                               13.  Soft A2 : ▢
                                               14.  Soft A3 : ▢

SWITCH  STATUS
   6. On-line Status: ▢
   8.  Switch Status: ▢








Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT


enter command: ▭
_____  _____  F3 DATA  _____   F5 HELP  F6 FIELD  F7 INPUT  F8 CMDS
```

   Fields 2-5 may contain a default equipment location from Test 1, 2, or 4, Procedure 600, or Procedure 620.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do a Hard Switch Between the TMS or MCC

1. If you want to select an on-line TMS or MCC choose from the following:
   - Enter nc until the equipment type of the TMS or MCC and the equipment location of the on-line duplication channel you want to test appears.
   - Enter nu until the equipment type you want to test appears, and then enter nc until the equipment location of the duplication channel you want to test appears.
   - If you know the equipment location, enter cf2 and enter the equipment type and module number of the TMS or MCC you want to test

2. Enter x to find the health of the TMS or MCC.
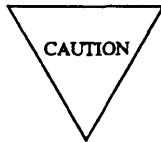
CAUTION   A hard switch disrupts service and affects normal call processing.

    Field 2 shows the equipment type (see Table 5-10).

    Fields 3-5 show the TMS or MCC equipment location.

    Field 6 shows the on-line status (see Table 5-6).

    Field 8 contains a 0 (see Table 5-8).

    Fields 9-14 show the health code of the TMS or MCC.

Before you hard switch between TMS or MCC, check whether the off-line side is soft locked.

3. Make sure that the off-line side is not soft locked.

   If the off-line side is soft locked, you cannot do a hard switch.

4. Enter rb to unlock the TMS or MCC.

   If the on-line side is not as healthy as the off-line side special error code 82 appears warning you that a hard switch may occur. If you must switch the TMS or MCC, enter rb again.

    Field 6 contains a 3 (see Table 5-6).

5. To enable the hard switch of the TMS or MCC enter `cf8` and enter a 1 in field 8.

6. Enter `x` to start a hard switch.

   Special error code 85 appears in the message line.

7. Enter `x` again to do a hard switch.

   `WAIT` appears on your screen.

   When `WAIT` disappears and if the switch is successful, the following appears.

   > Field 2 shows the equipment type (see Table 5-10).

   > Fields 3-5 show the off-line TMS or MCC equipment location.

   > Field 6 contains a 3 (see Table 5-6).

   > When you do a hard switch the off-line side is automatically soft locked. If the off-line side is healthier than the on-line side, the off-line side cannot switch back on-line.

   > Field 8 contains a 0 (see Table 5-8).

   > Fields 9-14 show the health code of the TMS or MCC.

   The switch records the cause and time of the hard switch.

   If the switch failed field 8 contains a 1. Special error code 80 appears in the message line.

   If fields 11-14 contain a 1 there are soft A or soft B problems. Use Procedure 600 Test 2 to look for network problems.

8. Enter `nu` to switch between the on-line and off-line TMS and MCC.

9. If you want to examine the switch history log or clear hard or soft switches, go to test 1.

10. If you want to do a soft switch, go to test 2.

11. If you want to initialize the TMS or MCC, go to test 4.

Test 4 - Operation

Use test 4 to initialize the TMS or MCC.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen choose one or both of the following.

   - To start the procedure, enter `p621`

   - If you are already in the procedure, but not in test 4, enter `t4`

   The test 4 screen, similar to the following, appears.

```
                     ENHANCED MODE - PROCEDURE: 621, TEST: 4
                   INITIALIZE A TMS OR NETWORK MODULE CONTROL CARRIER

 2. Equipment Type: ▢

EQUIPMENT  LOCATION                        HEALTH CODE
   3.   Module: ▢                           9.      cc: ▢
   4.  Cabinet: ▢                          10. Shut Down: ▢
   5.  Carrier: ▢                          11.    Soft B: ▢
                                           12.   Soft Al: ▢
                                           13.   Soft A2 : ▢
                                           14.   Soft A3 : ▢

INITIALIZATION  STATUS
   6.        On-line Status: ▢
   8. Initialization Status: ▢




Connected to CC0 ON-LINE ♥ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▭
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

   Fields 2-5 may contain a default equipment location from test 1-3, Procedure 600, Procedure
   620, or field 2 contains a 1 if there is no default equipment location.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Initialize the TMS or MCC

If the green LED on the TN380 or TN580 (module processor) or TN381 (TMS processor) is not flashing (no heartbeat) or if the red LED is on, you should initialize the module processor or TMS processor.

1. If you want to select a TMS or MCC choose from the following:

    - Enter `nu` until the equipment type you want to test appears, and then enter `nc` until the equipment location of the duplication channel you want to test appears.

    - If you know the equipment location, enter `cf2` and enter the equipment type and module number of the TMS or MCC you want to test.

2. Enter `x` to find the health of the TMS or MCC.

    Field 2 shows the equipment type (see Table 5-10).

    Fields 3-5 show the TMS or MCC equipment location.

    Field 6 shows the on-line status (see Table 5-6).

    Field 8 contains a 0 (see Table 5-8).

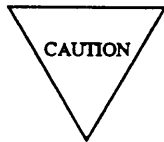   Fields 9-14 show the health code for the TMS or MCC.

    CAUTION: If you initialize an on-line TMS or MCC, service is disrupted in the switch. Initialize the off-line side of the TMS or MCC in a duplicated network switch.

3. To enable the initialization of the TMS or MCC, enter `cf8` and enter a 1 in field 8.

4. Enter `x` to start the initialization.

    Special error code 85 appears in the message line. You must enter `x` two times to initialize the TMS or MCC.

5. Enter `x` to initialize the TMS or MCC.

    `WAIT` appears on your screen.

    When `WAIT` disappears and if the initialization is successful, the following appears.

    Field 2 shows the equipment type (see Table 5-10).

    Fields 3-5 show the TMS or MCC equipment location.

    Field 6 shows the on-line status (see Table 5-6).

    Field 8 contains a 0 (see Table 5-8).

    Fields 9-14 shows the health code of the TMS or MCC.

    If the initialization failed, field 8 contains a `1`. Special error code 86 appears m the message line.

6. If you want to examine the switch history log or clear hard or soft switches, go to test 1.

7. If you want to do a soft switch, go to test 2.

8. If you want to do a hard switch, go to test 3.

To Initialize the TMS or MCC

If the green LED on the TN380 or TN580 (module processor) or TN381 (TMS processor) is not flashing (no heartbeat) or if the red LED is on, you should initialize the module processor or TMS processor.

1. If you want to select a TMS or MCC choose from the following:

   - Enter nu until the equipment type you want to test appears, and then enter nc until the equipment location of the duplication channel you want to test appears.

   - If you know the equipment location, enter cf2 and enter the equipment type and module number of the TMS or MCC you want to test.

2. Enter x to find the health of the TMS or MCC.

   Field 2 shows the equipment type (see Table 5-10).

   Fields 3-5 show the TMS or MCC equipment location.

   Field 6 shows the on-line status (see Table 5-6).

   Field 8 contains a 0 (see Table 5-8).

   Fields 9-14 show the health code for the TMS or MCC.

   > ⚠ CAUTION
   >
   > If you initialize an on-line TMS or MCC, service is disrupted in the switch. Initialize the off-line side of the TMS or MCC in a duplicated network switch.

3. To enable the initialization of the TMS or MCC, enter cf8 and enter a 1 in field 8.

4. Enter x to start the initialization.

   Special error code 85 appears in the message line. You must enter x two times to initialize the TMS or MCC.

5. Enter x to initialize the TMS or MCC.

   WAIT appears on your screen.

   When WAIT disappears and if the initialization is successful, the following appears.

   Field 2 shows the equipment type (see Table 5-10).

   Fields 3-5 show the TMS or MCC equipment location.

   Field 6 shows the on-line status (see Table 5-6).

   Field 8 contains a 0 (see Table 5-8).

   Fields 9-14 shows the health code of the TMS or MCC.

   If the initialization failed, field 8 contains a 1. Special error code 86 appears in the message line.

6. If you want to examine the switch history log or clear hard or soft switches, go to test 1.

7. If you want to do a soft switch, go to test 2.

8. If you want to do a hard switch, go to test 3.

Test 5 - Operation

Use test 5 to attempt to download firmware to a downloadable Universal Module Processor (the TN590, which replaces the TN580). Note that a firmware download disrupts service and affects normal call processing.

In test 5 you can:

View the test 5 screen	*page 5-57b*
Download firmware	*page 5-57c*

To View the Test 5 Screen

1. To see the test 5 screen choose one or both of the following.

    ● To start the procedure, enter `p621`

    ● If you are already in the procedure, but not in test 5, enter `t5`

    The test 5 screen, similar to the following, appears.

```
        ENHANCED MODE - PROCEDURE: 621, TEST: 5
          MODULE PROCESSOR FIRMWARE DOWNLOAD CONTROL


EQUIPMENT  LOCATION              MODULE PROCESSOR FIRMWARE VINTAGE
   3.  Module: ▢                    15.    Primary Vintage: ▢
   4. Cabinet: ▢                    16. Secondary Vintage: ▢
   5. Carrier: ▢                 MAIN MEMORY FIRMWARE IMAGE VINTAGE
                                    17.    Primary Vintage : ▢
                                    18. Secondary Vintage: ▢

SWITCH  STATUS
   6.            On-line Status: ▢
   8. Firmware Download Enable: ▢


HEALTH  CODE
   9.           cc: ▢
  10. Shut Down: ▢
  11.     Soft B: ▢
  12 1   Soft A1: ▢
  13.    Soft A2: ▢
  14.    Soft A3: ▢

Connected to CC0 ON-LINE ♡ │ MAJOR │ │ MINOR │ │ RUN TAPE │ │ BUSY OUT │ │ IN USE │ │ WAIT


enter command: ▭
└────────┘└────────┘│F3 DATA │└────────┘│F5 HELP ││F6 FIELD ││F7 INPUT ││F8 CMDS │
```

Fields 2-5 may contain a default equipment location from test 1-4, Procedure 600, or Procedure 620.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Download Firmware

The procedure used to download firmware to the DMP varies depending on the state of the LEDs on the DMP. The green LED slow heartbeat (500 msec on, 500 msec off) is the normal operating mode for the DMP. A slow heartbeat indicates that the DMP is ruining, firmware is downloaded, and the DMP is initialized correctly. Problems may exist that affect calls, but the DMP is initialized correctly. The possibility exists, however, that the firmware that is loaded may not match the load that the switch software expects. Use this test to check firmware vintage compatibility and perform a download if a mismatch exists.

Following is the procedure for executing test 5 under normal DMP operating mode:

1. To select an on-line or off-line module processor, choose from the following.

    - If an equipment location is already on your screen, enter `nc` until the off-line module processor appears.
    - If there is no default equipment location on your screen, enter the off-line module processor equipment location.

2. If the module control carrier is duplicated, soft lock the off-line side using the command `rb` in test 2. Return to test 5 to perform the download.

3. To enable the download of firmware to the module processor, enter `cf8` and enter a 1 in field 8.
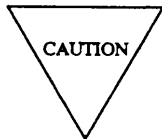
    > CAUTION
    >
    > A firmware download to the on-line module processor disrupts service and affects normal call processing.

4. Enter `x` twice to start a firmware download.

    > NOTE
    >
    > It takes about two minutes to do a firmware download. During this time, the green LED will be on solidly for about a minute and then switch to a flutter until the download is complete, when it will return to the normal slow heartbeat. During the download, error code 91 will be displayed indicating a download is taking place.
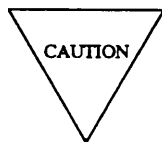
    > CAUTION
    >
    > Do not terminate the download prematurely! This is because call processing is disrupted during the download.

5. Enter `x` to see the health of the module processor.

    If field 6 contains a 1, the off-line side is soft locked and you can not do a hard switch.

6. Hard switch to the new downloaded module control carrier.

7. Repeat steps 1-6 for the other module control carrier.

Use this procedure whenever a download is called for in the following discussion of non-normal LED states.

Red and Green LEDs Both Off   This state indicates the 5V power to the board is absent or has failed. Correct the power problem and then use test 4 to initialize the TN590. Use test 5 to check for firmware compatibility with what the system expects. Perform a download if necessary.

Green LED Off— Red LED On If the LEDs are in this state, the DMP is in shutdown. The DMP may or may not be downloaded with firmware. Test 2, test 3, test 4, and test 5 will show "Shutdown" (field 10=1) if this condition is present.   Test 5 should not be used to attempt a firmware download until the DMP has been initialized with test 4. If test 5 is used to try to download firmware when the DMP is in shutdown, the PROC will give error 90, *The module processor you selected is not downloadable.*

To correct this problem, use test 4 to initialize the DMP.   This test, whether or not it passes, will clear the shutdown condition as long as no hardware fault exists.   If the initialization passes, check the firmware vintage in test 5 and perform a download if a firmware mismatch is shown.   If the initialization fails, the green LED might begin to flutter. This indicates that firmware must be downloaded. Perform a download with test 5.

If no firmware download is required, and test 4 does not successfully complete, and the green LED does not exhibit a slow heartbeat, suspect the TN590, UN154, TN401, TN444 or the TN402 that the TN401 is connected to.

Green LED in Super-Slow Heartbeat When the LEDs are in this state (green LED on for several seconds then off for several seconds, red LED on or off solid), the DMP might have failed some part of an initialization. To correct this problem, use test 4 to reinitialize the DMP.

Another possibility that can cause this LED state is a hardware fault on the TDM or LAN bus that is preventing the DMP from performing call processing. Test 5 should be used to check for the necessity of a firmware download because the firmware on the DMP may not match what the switch software expects.

If the firmware download and reinitialization do not recover the heartbeat to "slow", suspect a hardware fault in one or more of the following: UN154 UBI, offline UN154 UBI, TDM/LAN bus cable, TN590, or any port board.   If the problem is a port board, isolation can be performed by unseating each port board, reinitializing the DMP using test 4, and verifying the correct heartbeat.

Green LED in Off-Line DMP On or Off During Soft Switch   During a soft switch, the green LED might be on or off for three to four seconds, after which it returns to its normal slow heartbeat.

Green and Red LEDs Solid On   If the green and red LEDs remain on in any situation other than during a download, the DMP is in shutdown.   This is the same situation as when the green LED is solid off. See the section *Green LED Off — Red LED ON* for the procedures to follow.

Green LED in Fast Heartbeat   A fast heartbeat is 100 msec on, 100 msec off.   This state indicates that the DMP is running and that firmware is downloaded but also that the DMP has failed some portion of initialization. Run test 4 to reinitialize the DMP. If the initialization passes, check the firmware vintage in test 5 and perform a download if a firmware mismatch is shown.   If the initialization fails, the green LED might begin to flutter. This indicates that firmware must be downloaded. Perform a download with test 5.

If no firmware download is required, and test 4 does not successfully complete, and the green LED does not exhibit a slow heartbeat, suspect the TN590, UN154, TN401, or the TN444.

Green LED in Flutter

Anew LED state, flutter, has been added specifically for the DMP. A flutter is 30 msec on, 30 msec off, (16 flashes per second).   The fluttering green LED means that a firmware download is required. Use test 5 to download the firmware. If the green LED does not return to a slow heartbeat, suspect the TN590, UN154, TN401, or the TN444.

Special Error Codes

While using Procedure 621, you may see the following special error codes:

- `80=Switchover or firmware download failed.`

  You tried to do a soft or hard switchover and the switchover did not work or you tried to do a firmware download and the firmware download did not work

- `81=The message transmission to the module processor failed.`

  You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=Hard switch will occur.`
  or
  `82=Corrupt opcode failed`

  The health of the offline side is worse than the health of the on-line side. Repair the off-line TMS or module control so both sides are healthy.

  The attempt to initiate a firmware download failed when the module processor negatively acknowledged the corrupt opcode. Another download maybe attempted.

- `83=Lock or unlock failed.`
  or
  `83=Corrupt opcode failed.`

  You tried to soft lock or release the off-line TMS or module control. Try again.

  The attempt to initiate a firmware download failed when timeout occurred waiting for an acknowledgement of the corrupt opcode. Another download may be attempted.

- `84=The TMS or module control is not duplicated-you can only use test 4.`
  or
  `84=Module Processor reset failed.`

  You tried to do something that you can only do in a duplicated TMS or module control system. You cannot do a soft or hard switch on an unduplicated switch.

  The attempt to download firmware failed when a module processor failed to positively acknowledge a reset.

- `85=Enter x two times to switch, initialize or to enable a firmware download.`

  You tried to switch between the on-line and off-line network TMS or module control or initialize. You must enter x twice.

- `86=Initialization failed.`
  or
  `86=Program opcode failed.`

  You tried to initialize the TMS or module control and the attempt was not successful.

  The attempt to initiate a firmware download failed when the program opcode was negatively acknowledged or timeout occurred waiting for an acknowledge. Bootware is now in control of the module processor. Another download may be attempted.

- `87=Program opcode failed.`

The attempt to initiate a firmware download failed when timeout occurred waiting for an acknowledgement of the program opcode. Bootware is now in control of the module processor. Another download may be attempted.

- `88=Erase opcode failed.`

    The attempt to initiate a firmware download failed when the erase opcode was negatively acknowledged. Bootware is now in control of the module processor. Another download may be attempted.

- `89=Erase opcode failed.`

    The attempt to initiate a firmware download failed when timeout occurred waiting for an acknowledgement of the erase opcode. Bootware is now in control of the module processor. Another download may be attempted.

- `90=The module processor selected is not downloadable.`

TABLE 5-5

Field 2 Equipment Type
1   =   Network module
2   =   TMS

TABLE 5-8

Field 8 Switch Status
0   =   Switch disabled
1   =   Switch enabled

TABLE 5-6

Field 6 On-line Status
0   = On-line
1   = On-line and soft locked
2   = Off-line
3   = Off-line and soft locked

TABLE 5-9

Field 19 Switch Type
1   = 32 Hour periodic soft switch
2   = User requested hard switch
3   = User requested soft switch
4   = Soft switch for a recovery
5   = Hard switch due to hardware failure

TABLE 5-7

Field 7 Permission Status
0   = Soft switch permitted
1   = Soft switch permitted but problems exist
2   = Soft switch not permitted

Procedure Fields

The fields listed below are data entry fields.

- You can enter an equipment type in field 2.
- In test 1 you can select a specific module in field 3.
- In tests 2-5 you can select a specific equipment location in fields 3 through 5.
- In tests 2-5 you must enter a 1 in field 8 to enable a hard or soft switch, initialization, or to enable a firmware download.

The meaning of the fields are:

2.	`Equipment Type`	Shows whether you are viewing a TMS or MCC. Table 5-5 lists the equipment type encodes.
3-5.	`EQUIPMENT LOCATION`	Shows the equipment location of the TMS or MCC.
6.	`On-line Status`	Shows if the TMS or MCC is on-line and soft locked. Table 5-6 lists the on-line status encodes.
7.	`Permission Status`	Shows whether you can do a soft switch. Table 5-7 shows the permission status encodes.
8.	`Switch Status │ Initialization Status │ Firmware Download Enable`	Contains a `1` if a switch, initialization, or download is enabled or a `0` if a switch, initialization, or download is disabled- Table 5-8 shows the switch, initialization or download status encodes.

TABLE 5-10

Field 2 Unit Type		
1 = Environment	27 = General-purpose port (GPP)	56 = Intermodule data store (IDS)
2 = Disk Tape System (DTS)	28 = 72 Series (MFET) port	57 = Light guide interface (LGI)
3 = Initialization causes	29 = Line circuit	58 = Fan in (FI)
4 = Common control I/O	30 = Even port peripherals	59 = TMS maintenance
5 = Memory	31 = Auxiliary tone plant	60 = Diagnostic processor/remote interface
6 = Module control channel (MCC)	32 = CO trunk (hardware)	61 = Configuration audits
7 = Time multiplexed switch or module processor (TMS or MP)	33 = DID trunk (hardware)	62 = Analog/digital facility test (ADFTC)
8 = Maintenance interface	34 = Tie trunk/data port (hardware)	63 = External equipment
9 = Module clock	35 = Digital trunk	64 = External processor
10 = Time slot interchanger (TSI) - ALU	36 = Digital user problem	65 = Modem pooling
11 = Time slot interchanger (TSI) - PSTORE	37 = Calling number display	66 = Tone detector 2
12 = I/O bus interface (IOBI)	38 = Real time clock synchronizer	67 = Undefined exception FIFO errors
13 = Port data store (PDS)	39 = Force administration display system (FADS)	68 = DSI
14 = Port control interface (PCI)	40 = Nonnetwork peripherals	69 = Multifunction analog terminal (MFAT)
15 = Port data interface (PDI)	41 = Trunk, software	70 = Automatic transmission measurement system (ATMS)
16 = Tone plant	42 = Calls aborted	71 = Remote module interface (RMI)
17 = Attendant console	44 = Attendant console interface	72 = EIA interface
18 = Cache memory	45 = Auxiliary trunk	73 = Dedicated switch connection (DSC)
19 = Data communications interface unit (DCIU)	46 = Attendant conference	74 = Remote carrier group (RCG)
20 = Station message detail recorder (SMDR)	48 = Odd port peripherals	75 = Primary rate interface (PRI)
21 = Automatic number identification (ANT)	50 = TMS clock oscillator (TCO)	76 = ISDN error processing
22 = Processor duplication (501CC)	51 = Local clock termination (LCT)	77 = Processor communication circuit (PCC)
23 = TMS a network duplication channel	52 = System clock synchronizer (SCS)	78 = Basic rate interface (BRI)
24 = Touch-tone sender	53 = Multiplexer (MPX)	79 = Basic rate interface terminal (BRIT)
25 = Touch-tone receiver	54 = Fan out (FO)	80 = Universal bus interface (UBI)
26 = Network I/O	55 = Module interface (MI)	81 = Universal bus (UBI)
		83 = Network processing element (NPE)

9-14.	Health Status or Health Code	Field 9 contains a 1 if driven by the MCC on command from the 501CC.
		Field 10 contains a 1 if the TMS or module processor is stopped
		Field 11 contains a 1 if the TMS or module processor declares a Soft B condition.
		Field 12 contains a 1 if the 501CC declares a Soft Al condition.
		Field 13 contains a 1 if the 501CC declares a Soft A2 condition.
		Field 14 contains a 1 if the 501CC declares a Soft A3 condition.
15.	Switch Index or Vintage	Shows which hard or soft switchover cause you are viewing.
		In test 5 shows the module processor firmware vintage.
16-18.	TIME SWITCHED ON LINE VINTAGE	Shows the day, hour, and minute the TIMS or MCC switched on-line.
		In test 5 field 16 shows the module processor firmware vintage and fields 17 and 18 show the main memory firmware image vintage.
19.	Switch Type	Shows the type of hard or soft switch that occurred. Table 5-9 shows the switch type encodes.
20.	Unit Type	Shows the unit type that caused the switchover. Table 5-10 shows the unit type encodes.

PROCEDURE 622 - NETWORK PERIPHERALS TESTS

Purpose

Use Procedure 622 to examine the network peripherals failure history log, to resolve alarms, to test network peripherals, and to test transmissions to network peripherals.

Tests

Procedure 622 has four tests.

- Use test 1 to examine the network peripheral failure history log and to resolve alarms.

- Use test 2 to test one or more network peripherals once.

- Use test 3 to test one or more network peripherals continuously.

- Use test 4 to test the transmission quality to one or more network peripherals continuously.

Procedure Overview

Use Procedure 622 to test network peripherals in the switch. You can test digital telephone stations or digital data modules.

Use test 1 to see failure history and to resolve alarms.   Use test 2 to test one or more network peripherals once.   Use test 3 to test one or more network peripherals continuously.   Use test 4 to test the transmission quality to one or more network peripherals continuously. In tests 2 and 3 you can do a service-affecting test or a nonservice-affecting test. In test 4 you can only do a service-affecting test.

Procedure 622 tests unit types 30, 48, and 79.

Test 1 - Operation

Use test 1 to examine the network peripheral failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one or both of the following:

   • If you are already in the procedure, but not in test 1, enter `t1`

   • Otherwise enter `p622`

   The test 1 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 622, TEST: 1
                 EXAMINE THE NETWORK PERIPHERALS FAILURE HISTORY LOG

  2. Equipment Type: ❏


 EQUIPMENT LOCATION
    3.    Module: ❏
    4.   Cabinet: ❏
    5.   Carrier: ❏
    6.      Slot: ❏
    7.   Circuit: ❏


 STATUS
    8. Location Status: ❏
    9.    Alarm Status: ❏


 12.     Specific Fault Code: ❏
 14. Number of Times Failed: ❏
 15.          Failure Index: ❏



 Connected to CC0 ON-LINE ♡ [ MAJOR ] [ MINOR ] [ RUN TAPE ] [ BUSY OUT ] [ IN USE ] [ WAIT ]


 enter command: ▭
 [_____] [_____] [ F3 DATA ] [_____] [ F5 HELP ] [ F6 FIELD ] [ F7 INPUT ] [ F8 CMDS ]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Network Peripheral Failure History Log

1. Enter x to sort the network peripheral failure history log.

    WAIT appears on your screen as the switch sorts network peripheral failures. Minor alarms appear first. Warnings appear second. Errors appear last by equipment type and then by port equipment location in an equipment type.

    > Field 14 shows the number of network peripheral failures. If there are no failures, field 14 contains a 0.

2. Enter nc to view each failure.

    > Field 2 shows the equipment type (see Table 5-11).

    > Fields 3-7 show the port equipment location.

    > Field 8 shows the location status (see Table 5-12).

    > Field 9 shows the alarm status (see Table 5-13).

    > Field 12 shows the specific fault code. Record this number.

    > Field 14 shows the number of times the network peripheral failed.

    > Field 15 shows which failure you are viewing. The number in field 15 decreases by one as you view each failure.

3. To see failures of the next equipment type, enter nu

    After you view all failures, the switch dashes all fields except field 14. If you enter nu again, the summary appears.

4. Go to test 2 and test the network peripheral that failed.

5. If this is not the last failure repeat steps 2-5.

    After you view all failures, the switch dashes all fields except field 14. If you enter nc again, the summary appears.

6. If you want to resolve alarms, go to *To Resolve Alarms.*

7. If you want to test network peripherals, go to test 2.

8. If you want to test network peripherals continuously, go to test 3.

9. If you want to test the transmission quality to one or more peripherals, go to test 4.

To Resolve Alarms

You may want to resolve any invalid alarms from the network peripheral failure history log.

1. To resolve an alarm make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nc or nu until the alarm you want to resolve appears.

`
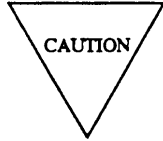
Record all network peripheral failures, and their specific fault codes, before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting.

2. Enter cdx to resolve the alarm.

    Field 9 contains a 5 (see Table 5-13).

    Field 14 shows the number of alarms and errors still in the network peripheral failure history log.

    The switch turns off **NETWORK PERIPH EQPT, MINOR,** or **WARNING** on the common-control alarm panel if there is no other reason for them to be on. MINOR disappears from your screen if there is no reason for it to be on. The switch marks network peripheral alarms resolved.

3. If you want to test network peripherals, go to test 2.

4. If you want to test network peripherals continuously, go to test 3.

5. If you want to test the transmission quality to one or more peripherals, go to test 4.

Test 2 - Operation

Use test 2 to test a single network peripheral or a range of network peripherals.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   ● To start the procedure, enter `p622`

   ● If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 622, TEST: 2
                    TEST NETWORK PERIPHERALS

 2. Equipment Type: ⬚


EQIPMENT LOCATION                    NUMBER OF DEVICES
  3.   Module: ⬚              13. Number of Times Tested: ⬚
  4.  Cabinet: ⬚              14. Number of Times Failed: ⬚
  5.  Carrier: ⬚
  6.    Slot : ⬚              15. Failure Index: ⬚
  7.  Circuit: ⬚


STATUS
  8. Location Status: ⬚
  9.    Alarm Status: ⬚
 10.  Circuit Status: ⬚


11.         Test Mode: ⬚
12. Specific Fault Code: ⬚



Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command:▬
[        ][        ][ F3 DATA ][        ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

The switch highlights field 2.

Fields 3-7 may contain a default equipment port location from Test 1, 3, or 4, Procedure 600 Test 1 or 2, or Procedure 620 Test 1-5.

Field 8 shows the location status of the default equipment location (see Table 5-12).

Field 9 shows the alarm status of the default equipment location (see Table 5-13).

Field 10 shows the circuit status of the default equipment location (see Table 5-14).

Field 11 contains a 0 (see Table 5-15).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

2. If you want to test the default equipment location go to *Test a Network Peripheral.*

To Select a Network Peripheral or a Range of Network Peripherals

1. If you want to select all network peripherals by equipment type choose from the following.

    - If you do not know the equipment type, enter `nu` until the equipment type you want to test appears.

      Equipment types appear numerically.

    - Enter `cf2` and, enter the equipment type.

    The switch tests all network peripherals with the equipment type you selected.

2. If you want to select all network peripherals in the switch, enter `cf2` and enter ; to blank fields 2 and 3.

    If you selected an equipment type the switch tests all network peripherals in the switch with the equipment type you selected.

3. If you want to test all network peripherals in a module, enter `cf2` and then enter the module number.

    The switch tests all network peripherals in the module. If you selected an equipment type the switch tests all network peripherals in the module with the equipment type you selected.

4. If you want to select all network peripherals in a cabinet, enter `cf2` and then enter the module and cabinet.

    The switch tests all network peripherals in the cabinet. If you selected an equipment type the switch tests all network peripherals in the cabinet with the equipment type you selected.

5. To select all network peripherals in a carrier, enter `cf2` and then enter the module, cabinet, and carrier.

    The switch tests all network peripherals in the carrier. If you selected an equipment type the switch tests all network peripherals in the carrier with the equipment type you selected.
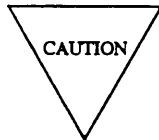
6. If you want to select all network peripherals in a slot, enter `cf2` and then enter the module, cabinet, carrier, and slot.

   The switch tests all network peripherals in the slot. If you selected an equipment type the switch tests all network peripherals in the slot with the equipment type you selected.

7. If you want to select a specific network peripheral choose one of the following.

   - Enter `cf2` and then enter the module, cabinet, carrier, slot, and circuit.

   - Enter `nu` until the equipment type appears and then enter `nc` until the port equipment location of the network peripheral you want to test appears.

8. If you want to busy out the port you selected, go to *To Busy Out a Port.*

9. If you selected a single port, go to *To Test a Network Peripheral.*

10. If you selected a range, go to *To Test a Range of Network Peripherals.*

To Busy Out a Port

1. Make sure that you selected a single port equipment location.

   If you do not enter the full equipment location special error code 88 appears in the message line.

   CAUTION — If you busy out a port equipment location that is in use the switch drops voice or data calls on the port.

   CAUTION — If you busy out a digital terminal with bridged appearances all calls on the terminals are dropped.

2. Enter `bo` to busy out the port.

3. If you want to test a port, go to *To Test a Network Peripheral.*

4. If you want to test a range of ports, go to *To Test a Range of Network Peripherals.*

5. If you want to examine the network peripheral failure history log, go to test 1.

6. If you want to test a network peripheral continuously, go to test 3.

7. If you want to test the transmission quality to one or more peripherals, go to test 4.

To Test a Network Peripheral

1. If you want to do a service-affecting test, enter `cf11` and enter a 1.

   In a service-affecting test the switch takes the network peripheral out of service to completely test the network peripheral. Any calls in progress to the network peripheral are lost. In a nonservice-affecting test the switch does transparent tests on network peripherals. Service is not interrupted.
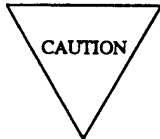
   ▽ CAUTION   A service-affecting tests takes the network peripheral out-of-service.

2. Enter `x` to test the network peripheral.

   `WAIT` appears on your screen.

   If the network peripheral is in-use, and you selected a nonservice-affecting test `IN-USE` appears on your screen. Wait until the network peripheral is not in use and then test it.

   when the test is done `WAIT` disappears from your screen.

   > Field 2 shows the equipment type (see Table 5-11).

   > Fields 3-7 show the port equipment location.

   > Field 8 shows the location status (see Table 5-12).

   > Field 9 shows the alarm status (see Table 5-13).

   > Field 10 shows the circuit status (see Table 5-14).

   > Field 11 shows the test type (see Table 5-15).

   > Field 13 shows the number of network peripherals tested.

   > Field 14 shows the number of failures.

3. To see each specific fault code logged against the failure, enter `nd`

   > Field 12 shows the specific fault code. Record this number.

   > Field 15 contains a 1.

4. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN basic rate interface (BRI) peripherals.

5. If you want to test another network circuit repeat steps 1-5.

6. If you busied out the port equipment location and there are no failures, enter `rb` to release the circuit from busy.

7. If you want to test another network peripheral, go to *To Select a Network Peripheral or a Range of Network Peripherals.*

8. If you want to test a network peripheral continuously, go to test 3.

9. If you want to examine the network peripheral failure history log, go to test 1.

10. If you want to test the transmission quality to one or more peripherals, go to test 4.

To Test a Range of Network Peripherals

1. If you want to do a service-affecting test, enter `cf11` and enter a 1.

   In a service-affecting test the switch takes the network peripheral out of service to completely test the network peripheral. Any calls in progress to the network peripheral are lost. In a nonservice-affecting test the switch does transparent tests on network peripherals. Service is not interrupted.
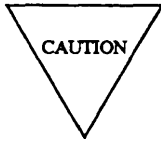
   ▽ CAUTION   A service-affecting tests takes the network peripheral out-of-service.

The test continues until you, enter s , until DMIDS fills up, or until the range is completely tested.

If you want to stop the test before the range is tested, enter s

The test does not stop until the network peripheral on your screen is tested. Special error code 86 appears in the message line. Special error code 83 appears in the message line.

If the test stops because DMIDS is full special error code 82 appears in the message line.

Fields 3-7 show the last network peripheral tested.

Field 11 shows the test type (see Table 5-15).

You can enter nc to examine test results, you can enter x to continue the test from where it stopped, or you can select a new range.

CAUTION   If you continue the test from where it stopped any test results are lost. Record all failure data before you continue the test.

After the switch tests the range of network peripherals WAIT disappears from your screen.

Field 2 shows the equipment type (see Table 5-11).

Fields 3-6 show the equipment location.

Field 11 shows the test type (see Table 5-15).

Field 13 shows the number of network peripherals that were tested.

Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

3. Enter nc to see each failure.

Field 2 shows the equipment type (see Table 5-11).

Fields 3-7 show the port equipment location.

Field 8 shows the location status (see Table 5-12).

Field 9 shows the alarm status (see Table 5-13).

Field 10 shows the circuit status (see Table 5-14).

Field 11 shows the test type (see Table 5-15).

Field 12 shows the specific fault code. Record this number.

Field 13 shows the number of times the network peripheral was tested.

Field 14 shows the number of times the network peripheral failed.

Field 15 shows which failure you are viewing. The number in field 15 decreases by one as you view each alarm.

4. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN BRI peripherals.

5. If you want to see failures for another equipment type, enter `nu`

    Fields 3-7 show the equipment location of the first network peripheral with failures for the new equipment type.

    The number in field 15 decreases by the number of failures you skipped.

6. If this is not the last failure repeat steps 2-6.

    After you view all failing network peripherals the switch dashes fields 2 through 15.

    If you enter `nc` or `nu` again, the summary appears.

    After all network peripherals pass the test the switch turns off **NETWORK PERIPH EQP, MINOR,** or **WARNING** on the common-control alarm panel if there is no other reason for them to be on. The switch marks network peripheral alarms resolved. MINOR disappears from your screen if there is no other reason for it to be on.

7. If you want to test another range of network peripherals, go to *To Select a Network Peripheral or Range of Network Peripherals.*

8. If you want to examine the network peripheral failure history log, go to test 1.

9. If you want to test a network peripheral continuously, go to test 3.

10. If you want to test the transmission quality to one or more peripherals, go to test 4.

Test 3 - Operation

Use test 3 to test one or more network peripherals continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    ● To start the procedure, enter p622

    ● If you are already in the procedure, but not in test 3, enter t3

      The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 622, TEST: 3
                  CONTINUOUSLY  TEST  NETWORK  PERIPHERALS

 2. Equipment Type: ▢

EQUIPMENT LOCATION                      NUMBER OF DEVICES
   3.   Module: ▢                       13. Number of Times Tested: ▢
   4. Cabinet: ▢                        14. Number of Times Failed: ▢
   5. Carrier: ▢
   6.    Slot: ▢                        15. Failure Index: ▢
   7. Circuit: ▢

STATUS
   8. Location Status: ▢
   9.    Alarm Status: ▢
  10.   Circuit Status: ▢

11.          Test Mode: ▢
12. Specific Fault Code: ▢


Connected to CC0 ON-LINE  ♡ [ MAJOR ] [ MINOR ] [ RUN TAPE ] [ BUSY OUT ] [ IN USE ] [ WAIT ]

enter command: ▭
[_____] [_____] [F3 DATA] [_____] [F5 HELP] [F6 FIELD] [F7 INPUT] [F8 CMDS]
```

The switch highlights field 2

Fields 3-5 show a default equipment location from test 1 or 2.

Field 8 shows the location status of the default equipment location (see Table 5-12).

Field 9 shows the alarm status of the default equipment location (see Table 5-13).

Field 10 shows the circuit status of the default equipment location (see Table 5-14).

Field 11 contains a 0 (see Table 5-15).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Network Peripheral or a Range of Network Peripherals

1. If you want to select all network peripherals by equipment type, choose from the following.

   - If you do not know the equipment type, enter `nu` until the equipment type you want to test appears.

     Equipment types appear numerically.

   - Enter `cf2` and enter the equipment type.

   The switch tests all network peripherals with the equipment type you selected

2. If you want to select the entire switch, enter `cf2` and type ; ; to blank fields 2 and 3.

   The switch tests all network peripherals in the switch. If you selected an equipment type the switch tests all network peripherals in the switch with the equipment type you selected.

3. If you want to test all network peripherals in a module, enter `cf2` and then enter the module number.

   The switch tests all network peripherals in the module. If you selected an equipment type, the switch tests all network peripherals in the module with the equipment type you selected.

4. If you want to select all network peripherals in a cabinet, enter `cf2` and then enter the module and cabinet.

   The switch tests all network peripherals in the cabinet. If you selected an equipment type the switch tests all network peripherals in the cabinet with the equipment type you selected.

5. To select all network peripherals in a carrier, enter `cf2` and then enter the module, cabinet, and carrier.

   The switch tests all network peripherals in the carrier. If you selected an equipment type the switch tests all network peripherals in the carrier with the equipment type you selected.
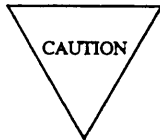
6. If you want to select all network peripherals in a slot, enter `cf2` and then enter the module, cabinet, carrier, and slot.

    The switch tests all network peripherals in the slot. If you selected an equipment type the switch tests all network peripherals in the slot with the equipment type you selected.
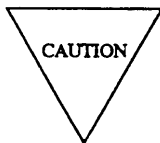
7. If you want to select a specific network peripheral choose one of the following.

    - Enter `cf2` and then enter the module, cabinet, slot, and circuit.
    - Enter `nu` until the equipment type appears and then enter `nc` until the port equipment location of the network peripheral you want to test appears.

8. If you want to busy out the port you selected, go to *To Busy Out a Port.*

9. If you selected a single port, go to *To Test a Network Peripheral.*

10. If you selected a range, go to *To Test a Range of Network Peripherals.*

To Busy Out a Port

1. Make sure that you selected a single port equipment location. If you do not enter the full equipment location special error code 88 appears in the message line.

       If you busy out a port equipment location that is in use the switch drops voice or data calls on the port.
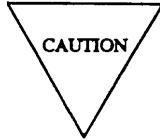
       If you busy out a digital terminal with bridged appearances all calls on the terminals are dropped.

2. Enter `bo` to busy out the port.

3. If you selected a single port, go to *To Test a Network Peripheral.*

4. If you selected a range, go to *To Test a Range of Network Peripherals.*

To Test a Network Peripheral Continuously

1. If you want to do a service-affecting test, enter `cfll` and enter a `1`.

   In a service-affecting test the switch takes the network peripheral out of service to completely test the network peripheral. Any calls in progress to the network peripheral are lost. In a nonservice-affecting test the switch does transparent tests on network peripherals. Service is not interrupted.

   ▽ **CAUTION**   A service-affecting tests takes the network peripheral out-of-service.

2. Enter `x` to test a network peripheral continuously.

   If the network peripheral is in-use, and you selected a nonservie-affecting test `IN-USE` appears on your screen.

3. Enters to stop the test.

   Field 2 shows the equipment type (see Table 5-11).

   Fields 3-7 show the port equipment location.

   Field 8 shows the location status (see Table 5-12).

   Field 9 shows the alarm status (see Table 5-13).

   Field 10 shows the circuit status (see Table 5-14).

   Field 11 shows the test type (see Table 5-15).

   Field 13 shows the number of network peripherals tested.

   Field 14 shows the number of failures.

   To see each specific fault code logged against the failure, enter `nd`

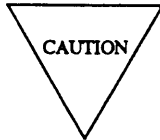   Field 12 shows the specific fault code. Record this number.

   Field 15 contains a 1.

5. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN BRI peripherals.

6. If you want to test another network circuit repeat steps 1-5.

7. If you busied out the port equipment location and there are no failures, enter `rb` to release the circuit from busy.

8. If you want to examine the network peripheral failure history log, go to test 1.

9. If you want to test network peripherals, go to test 2.

10. If you want to test the transmission quality to one or more peripherals, go to test 4.

To Test a Range of Network Peripherals Continuously

1. If you want to do a service-affecting test, enter `cf11` and enter a `1`.

   In a service-affecting test the switch takes the network peripheral out of service to completely test the network peripheral. Any calls in progress to the network peripheral are lost. In a nonservice-affecting test the switch does transparent tests on network peripherals. Service is not interrupted.

   ⚠ CAUTION   A service-affecting tests takes the network peripheral out-of-service.

2. Enter `x` to test the range of network peripherals.

   If a network peripheral is in-use, and you selected a nonservice-affecting test mode `IN-USE` appears on your screen.

   As the switch tests each circuit in the range the following fields change.

   > Field 2 shows the equipment type (see Table 5-11).

   > Fields 3-7 show the port equipment location.

   > Field 9 shows the alarm status (see Table 5-13).

   > Field 10 shows the circuit status (see Table 5-14).

   > Field 13 shows the number of network peripherals tested.

   > Field 14 shows the number of network peripherals that failed.

   The test continues until you enter `s` until DMIDS fills up or until the range is completely tested.

   If you want to stop the test before the range is tested, enter `s`
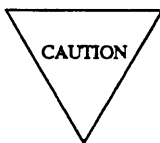
   The test does not stop until the network peripheral on your screen is tested. Special error code 86 appears in the message line. Special error code 83 appears in the message line.

   If the test stops because DMIDS is full, special error code 82 appears in the message line.

   > Fields 3-7 show the last network peripheral tested.

   > Field 11 shows the test type (see Table 5-15).

   You can enter `nc` to examine test results, you can enter `x` to continue the test from where it stopped, or you can select a new range.

   ⚠ CAUTION   If you continue the test from where it stopped any test results are lost. Record all failure data before you continue the test.

3. Enter `s` to stop the test.

    Field 2 shows the equipment type (see Table 5-11).

    Fields 3-6 show the equipment location.

    Field 11 shows the test type (see Table 5-15).

    Field 13 shows the number of network peripherals that were tested.

    Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

4. Enter `nc` to see each failure.

    Field 2 shows the equipment type (see Table 5-11).

    Fields 3-7 show the port equipment location.

    Field 8 shows the location status (see Table 5-12).

    Field 9 shows the alarm status (see Table 5-13).

    Field 10 shows the circuit status (see Table 5-14).

    Field 11 shows the test type (see Table 5-15).

    Field 12 shows the specific fault code. Record this number.

    Field 13 shows the number of times the network peripheral was tested.

    Field 14 shows the number of times the network peripheral failed.

    Field 15 shows which failure you are viewing. The number in field 15 decreases by one as you view each alarm.

5. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN BRI peripherals.

6. If you want to see failures for another equipment type, enter `nu`

    Fields 3-7 show the equipment location of the first network peripheral with failures for the new equipment type.

    The number in field 15 decreases by the number of failures you skipped.

7. If this is not the last failure repeat steps 2-7.

    After you view all failing network peripherals the switch dashes fields 2 through 15. If you enter `nc` or `nu` again, the summary appears.

8. If you want to test another range of network peripherals, go to *To Select a Network Peripheral or Range of Network Peripherals.*

9. If you want to examine the network peripheral failure history log, go to test 1.

10. If you want to test network peripherals, go to test 2.

11. If you want to test the transmission quality to one or more peripheral go to test 4.

Test 4 - Operation

Use test 4 to test the transmission quality to one or more network peripherals continuously. You can only test general purpose ports (GPP) in a traditional module with test 4.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

   ● To start the procedure, enter p622

   ● If you are already in the procedure, but not in test 4, enter t4

   The test 4 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────────┐
│            ENHANCED MODE - PROCEDURE: 622, TEST: 4                      │
│          CONTINUOUSLY TEST TRANSMISSION QUALITY TO NETWORK PERIPHERALS  │
│                                                                        │
│  2. Equipment Type: ⬚                                                   │
│                                                                        │
│ EQUIPMENT LOCATION                     NUMBER OF DEVICES                │
│    3.  Module: ⬚                         13. Number of Times Tested: ⬚  │
│    4. Cabinet: ⬚                         14. Number of Times Failed: ⬚  │
│    5. Carrier: ⬚                                                        │
│    6.   Slot : ⬚                         15. Failure Index: ⬚           │
│    7. Circuit: ⬚                                                        │
│                                                                        │
│ STATUS                                                                 │
│    8. Location Status: ⬚                                               │
│    9.   Alarm Status: ⬚                                                │
│   10.  Circuit Status: ⬚                                               │
│                                                                        │
│  11.       Test Mode: ⬚                                                │
│  12. Specific Fault Code: ⬚                                            │
│                                                                        │
│                                                                        │
│ Connected to CC0 ON-LINE ▽ ┃MAJOR┃ ┃MINOR┃ ┃RUN TAPE┃ ┃BUSY OUT┃ ┃IN USE┃ ┃WAIT┃ │
│                                                                        │
│ enter command: ▭                                                       │
│ ┃_____┃ ┃F3 DATA┃ ┃_____┃ ┃F5 HELP┃ ┃F6 FIELD┃ ┃F7 INPUT┃ ┃F8 CMDS┃    │
└──────────────────────────────────────────────────────────────────────┘
```

The switch highlights field 2.

Fields 3-7 may contain a default equipment location.

Field 9 shows the alarm status (see Table 5-13).

Field 10 shows the circuit status (see Table 5-14).

Field 11 shows the test type and contains a 0 (see Table 5-15).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Network Peripheral or a Range of Network Peripheral

1. If you want to select all network peripherals by equipment type, choose from the following.
   - If you do not know the equipment type, enter nu until the equipment type you want to test appears.

     Equipment types appear numerically.
   - Enter cf2 and enter the equipment type.

   The switch tests all network peripherals with the equipment type you selected.

2. If you want to select the entire switch, enter cf2 and type ; ; to blank fields 2 and 3.

   The switch tests all network peripherals in the switch. If you selected an equipment type the switch tests all network peripherals in the switch with the equipment type you selected.

3. If you want to test all network peripherals in a module, enter cf2 and then enter the module number.

   The switch tests all network peripherals in the module. If you selected an equipment type, the switch tests all network peripherals in the module with the equipment type you selected.

4. If you want to select all network peripherals in a cabinet, enter cf2 and then enter the module and cabinet.

   The switch tests all network peripherals in the cabinet. If you selected an equipment type the switch tests all network peripherals in the cabinet with the equipment type you selected.

5. To select all network peripherals in a carrier, enter cf2 and then enter the module, cabinet, and carrier.

   The switch tests all network peripherals in the carrier. If you selected an equipment type the switch tests all network peripherals in the carrier with the equipment type you selected.
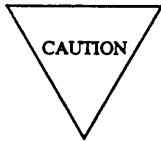
6. If you want to select all network peripherals in a slot, enter `cf2` and then enter the module, cabinet, carrier, and slot.

   The switch tests all network peripherals in the slot. If you selected an equipment type the switch tests all network peripherals in the slot with the equipment type you selected.
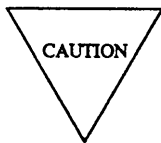
7. If you want to select a specific network peripheral choose one of the following.

   - Enter `cf2` and then enter the module, cabinet, carrier, slot, and circuit.
   - Enter `nu` until the equipment type appears and then enter `nc` until the port equipment location of the network peripheral you want to test appears.

8. If you want to busy out the port you selected, go to *To Busy Out a Port.*

9. If you selected a single port, go to *To Test a Network Peripheral.*

10. If you selected a range, go to *To Test a Range of Network Peripherals.*

To Busy Out a Port

1. Make sure that you selected a single port equipment location.

   If you do not enter the full equipment location special error code 88 appears in the message line.

   ▽ CAUTION   If you busy out a port equipment location that is in use the switch drops voice or data calls on the port.

   ▽ CAUTION   If you busy out a digital terminal with bridged appearances all calls on the terminals are dropped.

2. Enter `bo` to busy out the port.

3. If you selected a single port, go to *To Test a Network Peripheral.*

4. If you selected a range, go to *To Test a Range of Network Peripherals.*

To Test a Network Peripheral

1. Make sure that you selected a network peripheral to test.

2. Enter `cf11` and enter a `1` in field 11 to make test 4 service affecting.
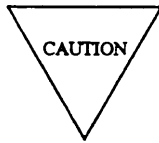
Service affecting tests take the peripheral out-of-service while testing it.

Special error code 87 appears on the message line if you select equipment type 4 or 18. If you try to run test 4 without changing field 11 special error code 84 appears in the message line.

3. Enter `x` to test the transmission quality to a network peripheral.

If the DMIDS storage buffer becomes full either during testing of a range of network peripherals or a single network peripheral special error code 82 appears in the message line. Testing continues but the oldest data is overwritten.

When testing a single network peripheral new failures are added to the failure list and the oldest errors are deleted. Test results can be examined when the DMIDS buffer becomes full and you enter `s`

When a single network peripheral is tested, the 99 errors are the newest errors recorded.

If you are testing a range, the following fields change as the switch tests each network peripheral.

> Field 2 shows the equipment type (see Table 5-11).

> Fields 3-7 show the port equipment location.

> Field 9 shows the alarm status (see Table 5-13).

> Field 10 shows the circuit status (see Table 5-14).

> Field 13 shows the number of network peripherals tested.

> Field 14 shows the number of failures. If there are no failures, field 14 contains a

4. Enter `s` to stop the test.

If the circuit is not completely tested once the switch continues to test the network peripheral. Special error code 86 appears in the message line until the switch finishes testing.

> Field 2 shows the equipment type (see Table 5-11).

> Fields 3-7 show the equipment location of the network peripheral.

> Field 8 shows the location status (see Table 5-12).

> Field 9 shows the alarm status (see Table 5-13).

> Field 10 shows the circuit status (see Table 5-14).

> Field 11 shows the test type (see Table 5-15).

> Field 13 shows the number of times the network peripheral was tested.

Field 14 shows the number of times the network peripheral failed. If there are no failures, field 14 contains a 0.

5. Enter nd to see each specific fault code recorded for the network peripheral.

Field 12 shows the specific fault code. Record this number.

Field 15 shows the number of fault codes recorded. If field 15 contains a number greater than one, more than one fault code was recorded for the failure.

6. If this is not the last specific fault code, repeat steps 4-6.

After you view all fault codes, the switch dashes fields 12-15. If you enter nd again, the first fault code appears.

7. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN BRI peripherals.

8. If the poet equipment location was busied out and the test passed, enter rb to release the circuit from busy.

9. If you want to test another network peripheral, go to *To Select a Network Peripheral or Range of Network Peripherals.*

10. If you want to examine the network peripherals failure history log, go to test 1.

11. If you want to test network peripherals, go to test 2.

12. If you want to test network peripherals continuously, go to test 3.

To Test a Range of Network Peripherals

If you select equipment type 4 or 18 special error code 87 appears on the message line.

1. Make sure that you selected a range of network peripherals to test.

2. Enter cfll and enter a 1.
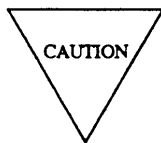
CAUTION   Service affecting tests take the peripheral out-of-service while testing it.

If you try to run test 4 without changing field 11, special error code 84 appears in the message line.

3. Enter x to test the transmission quality to a range of network peripherals.

   If DMIDS fills up special error code 82 appears in the message line. Testing continues but the oldest data is overwritten.

   The following fields change as the switch tests each network peripheral in the range you selected.

   Field 2 shows the equipment type (see Table 5-11).

   Fields 3-7 show the port equipment location.

   Field 9 shows the alarm status (see Table 5-13).

   Field 10 shows the circuit status (see Table 5-14).

   Field 13 shows the number of network peripherals tested.

   Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

4. Enter s to stop the test.

   Fields 2 shows the equipment type.

   Fields 3-7 show the equipment location.

   Field 9 shows the alarm status (see Table 5-13).

   Field 10 shows the circuit status (see Table 5-14).

   Field 11 shows the test type (see Table 5-15).

   Field 13 shows the number of network peripherals tested.

   Field 14 shows the number of failures. If there are no network peripheral failures, field 14 contains a 0.

5. Enter nc to see each network peripheral failure.

   Field 2 shows the equipment type (see Table 5-11).

   Fields 3-7 show the equipment location.

   Field 8 shows the location status (see Table 5-12).

   Field 9 shows the alarm status (see Table 5-13).

   Field 10 shows the circuit status (see Table 5-14).

   Field 11 shows the test type (see Table 5-15).

   Field 12 shows the specific fault code. Record this number.

   Field 13 shows the number of network peripherals tested.

   Field 14 shows the number of network peripherals that failed.

   Field 15 shows which failure you are viewing.

6. If you tested more than one equipment type, enter nu to see the first network peripheral of the next equipment type with failures.

   Field 15 shows which failure you are viewing. The number in field 15 decreases by the number of failures you skipped.

   After you view all failures, the switch dashes fields 2-10 and 12-15. If you enter nu again, the number of failures appears.

7. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies,* (555-104-118) and follow the repair steps for unit type 30 for even port peripherals, unit type 48 for odd port peripherals, or unit type 79 for ISDN BRI peripherals.

8. If this is not the last failure repeat steps 5-8.

    After you view all failures, the switch dashes fields 2-15. If you enter `nc` again, the failure summary appears.

9. If you want to test another range, go to *To Select a Network Peripheral or a Range of Network Peripherals.*

10. If you want to examine the network peripheral failure history log, go to test 1.

11. If you want to test network peripherals, go to test 2.

12. If you want to test a network peripheral continuously, go to test 3.

Special Error Codes

While using Procedure 622, you may see the following special error codes.

- `81=The message transmission to the module processor failed.`

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=DMIDS  overflow.`

    There are more errors than DMIDS can hold. You can examine errors, select another equipment location, or continue testing. If you continue the test, any test results gathered are lost. Record all failure data before you continue the test.

- `83=The test of range has not completed.`

    You stopped the test before the range was tested completely or before the equipment was tested once.

- `84=You must run test 4 in service-affecting mode (mode 1 ) .`

- `85=Location  range  error.`

- `86=Wait until test  completes.`

- `87=You cannot use test 4 to test this equipment type.`

- `88=Data must be entered in fields 3-7 before you enter bo.`

- `89=Switch resources are not available, try again.`

Procedure Fields

The fields listed below are data entry fields.

- In test 2-4 you can select an equipment type to be tested in field 2.

- In test 2-4 you can select equipment location infields 3-7.

- In test 2-4 you can enable the mode of test in field 11.

The meaning of the fields are:

2.	Equipment Type	Shows the equipment type of the network peripheral on your screen. Table 5-11 shows the equipment type encodes.
3-7.	EQUIPMENT LOCATION	Shows the equipment location of the equipment type in field 2. If you are testing equipment types 2, 8, 10, 12, 14, 16, 17, 20, 21, 22, 23, 24, or 25, you can view the even or odd port channel. If you busy out or release the odd channel the even port is not affected. If you busy out or release the even channel the even and odd channel will be affected.
8.	Location Status	Shows where the network peripheral is physically located and how it is connected to the switch. Remote circuits in a remote carrier group can be physically located up to 100 miles from the carrier you are testing. his field may show that a circuit is located in a remote carrier group. A remote carrier group is not a remote module. Table 5-12 shows the location status encodes.
9.	Alarm Status	Shows the alarm status of a network peripheral circuit that is alarmed. Table 5-13 shows the alarm status encodes.

TABLE 5-11

Field 2 Equipment Type	
1 = PDM	15 = 7404D data module
2 = 74 Series	16 = Dual port data- even port channel
3 = DTDM	17 = Dual port data - odd port channel
4 = 72 Series	18 = 73 series
5 = TDM	19 = 7401D Voice Station
6 = PDM/2	20 = 7406D voice station
7 = TDM/2	21 = PC even port channel
8 = 7407D voice station	22 = PC odd port channel
9 = 7407D data module	23 = Voice terminal with optional data
10 = BCT 510 voice station	24 = Integrated voice/data - even port channel
11 = BCT510 data module	25 = Integrated voice/data - odd port channel
12 = BCT 515 voice station	26 = User defined data module (not associated with voice terminal)
13 = BCT 515 data module	27 = ISDN Basic Rate Terminal
14 = 7404D voice station	

TABLE 5-12

Field 8 Location Status		
0	=	Local port
1	=	Remote port connected by a T1 carrier
2	=	Remote port connected by fiber

TABLE 5-13

Field 9 Alarm Status		
0	=	No errors recorded
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarm resolved

TABLE 5-14

Field 10 Circuit Status		
0	=	Idle
1	=	In use
2	=	Busied out by demand
3	=	Busied out at the terminal
4	=	Busied out by periodic maintenance task

TABLE 5-15

Field 11 Test Mode		
0	=	Nonservice affecting
1	=	Service affecting

10.   `Circuit Status`   Shows the circuit status. Table 5-14 shows the circuit status encodes.

11.   `Test Mode`   Shows whether you selected a destructive or nondestructive test. Service affecting tests take the peripheral out-of-service while testing it. Table 5-15 shows the test mode encodes.

12.   `Specific Fault Code`   Shows the specific hardware or software component that failed. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.

13.   `Number of Times Tested`   Shows the number of times the switch tested the network peripheral.

14.   `Number of Times Failed`   Shows the number of times the network peripheral failed.

15.   `Failure Index`   Shows which failure you are viewing. The number in field 15 decreases by one as you view each failure. If you enter `nu` to see the next equipment location with failures, the number in field 15 decreases by the number of failures you skipped.

PROCEDURE 623 - ANI TRUNK CIRCUIT TESTS

Purpose

Use Procedure 623 to examine the automatic number identification (ANI) trunk failure history log, to resolve alarms, and to test ANI trunk circuits.

Tests

Procedure 623 has four tests.

Use test 1 to examine the ANI hunk failure history log and to resolve alarms.

Use test 2 to send four test messages.

Use test 3 to send a single test message.

Use test 4 to send four messages continuously.

Procedure Overview

Use Procedure 623 to send test messages from the switch to an ANI trunk circuit. You must be at the switch site to do Procedure 623.

Use an ANI test set to verify the assigned four digit trunk and station number used for the ANI feature. You will need the following equipment to test ANI trunk circuit packs.

TABLE 5-16

Suggested Test Equipment		
Quantity	Description	Comcode
1	ANI-Data Link Test Set	J59204AJ

To Set Up the Test Set

1. Make sure that power is **OFF** on the ANI test set (see Figure 5-3).

2. Put the test set near the SN244 trunk circuit pack you want to test.

3. Connect the test cable to the ANI test set.

4. Connect the other end of the test cable to the SN244 circuit pack you want to test.

5. At the cross-connect field, disconnect the tip and ring leads of the ANI trunk circuit you want to test.

6. Plug the test set into a 117-VAC source.

7. Make sure **POWER** is **OFF.**

8. Set **ALARM** to **OFF.**

9. Set **NORMAL/HOLD** to **NORMAL.**

10. Set **ERROR MODE/VERIFY MODE** to **ERROR MODE.**

11. Set **TRUNK/STATION** to **STATION.**

12. Set **SELF-CHECK** to **OFF.**

13. Set **MODE** to **ANI** or **SLF-CH.**

14. Set the **ANI TEST** switch, on the test cable, to **ON.**

15. Set **POWER** to **ON.**

To Examine Error with the Test Set

1. Look at the **TRUNK/STATION MATCH** display on the test set.

    It sequentially shows the trunk or station numbers listed in field 2.

    If there is an error, **ERROR COUNT** advances one count. The error word on the **TRUNK/STATION MATCH** display contains a dash or is incorrect.

2. Switch **TRUNK/STATION** to **STATION** to see other messages.

3. Set **NORMAL/HOLD** switch to **HOLD** to lock an error into the display register.
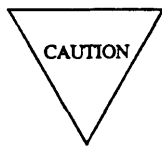
> ⚠ CAUTION
>
> If you do not set **NORMAL/HOLD** to **HOLD,** the next message clears the register. While the switch is in **HOLD,** other messages do not appear. Any errors are logged, and the error counter is incremented.
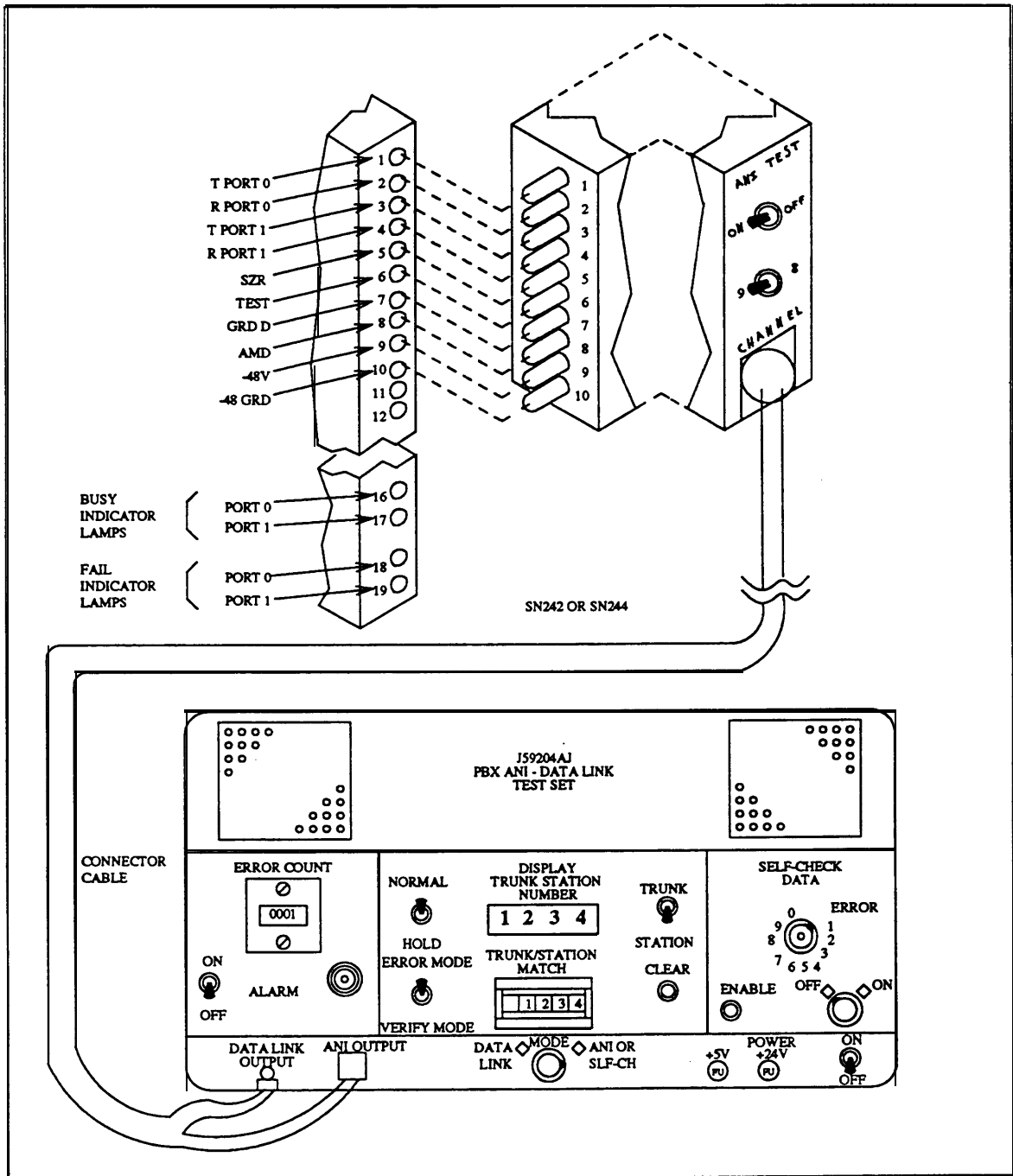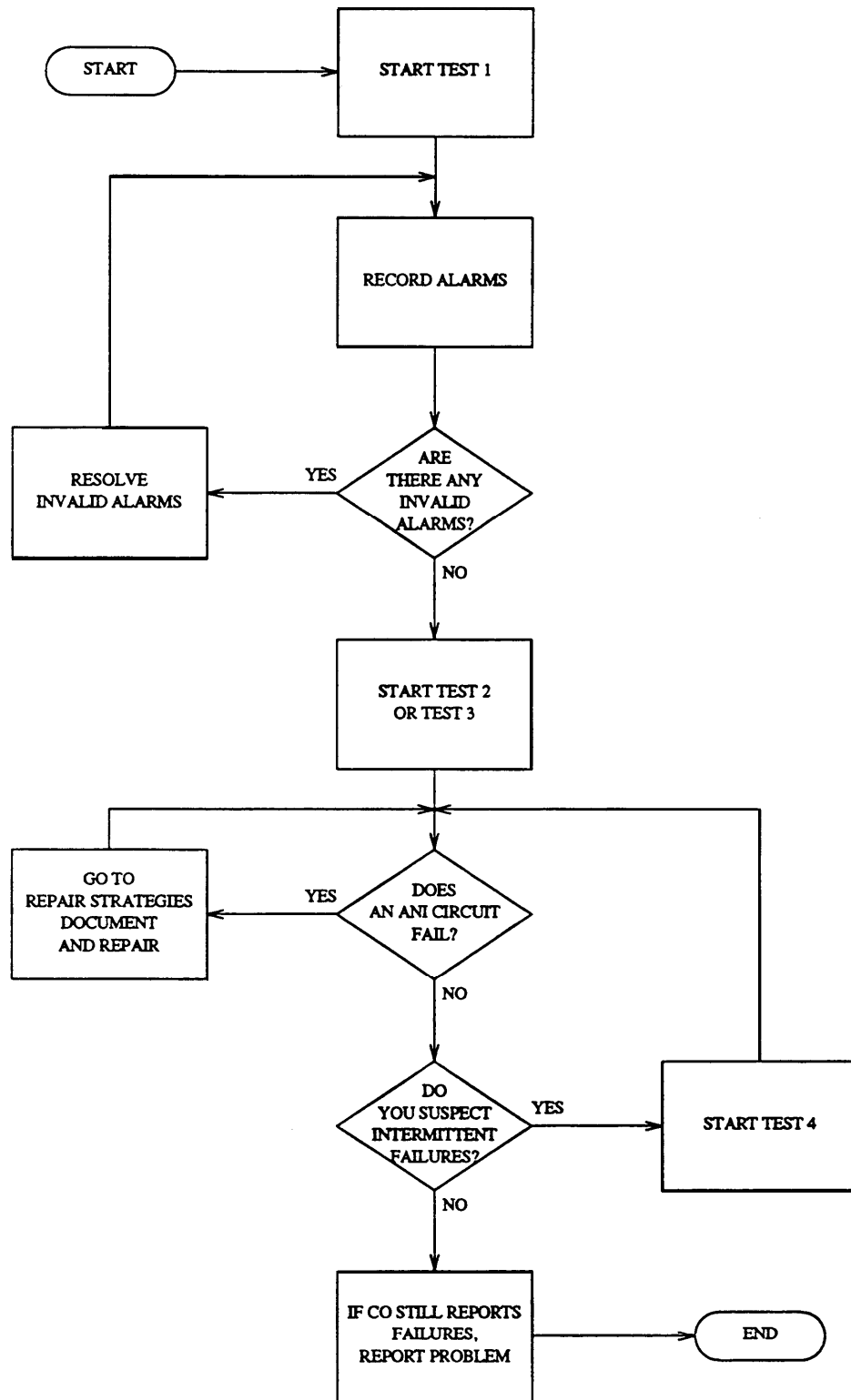
Figure 5-3. ANI Test Set

Figure 5-4. To Examine Alarms and Test ANI Trunk Circuits

Test 1 - Operation

Use test 1 to examine the ANI trunk failure history log and to resolve alarms.

In test 1 you can:

View the test 1 screen	*page 5-103*
Examine the ANI failure history log	*page 5-104*
Resolve alarms	*page 5-105*

To View the Test 1 Screen

1. To see the test 1 screen choose from the following:

   - If you are already in the procedure, but not in test 1, enter `tl`

   - Otherwise, enter `p623`

     The test 1 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 623, TEST: 1
               EXAMINE THE ANI FAILURE HISTORY LOG


TRUNK EQUIPMENT LOCATION
    3.   Module: ▢
    4. Cabinet: ▢
    5. Carrier: ▢
    6.    Slot: ▢
    7. Circuit: ▢

 8. Failure Cause: ▢
 9. Number of Failures Per Hour: ▢
10.          Number of Attempts: ▢


ERROR TYPE
   11.         Load Errors: ▢
   12.     Time Out Errors: ▢
   13.  Transmission Errors: ▢
   14. Queue Overflow Errors: ▢



Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][ F3 DATA ][_____][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the ANI Failure History Log

1. Enter x to sort the ANI failure history log.

    Field 9 shows the number of failures per hour, the failure summary. If there are no failures, field 9 contains a 0.

    If there are any failures, the following appears:

    > Fields 3-7 show the trunk equipment location.

    > Field 8 shows the failure cause (see Table 5-18).

    > Field 9 shows the number of failures per hour.

    > Field 10 shows the number of ANI call attempts.

    > Field 11 shows the number of load errors.

    > Field 12 shows the number of time out errors.

    > Field 13 shows the number of transmission errors.

    > Field 14 shows the number of queue overflow errors.

2. Enter nc to see each failure.

    > Fields 3-7 show the trunk equipment location.

    > Field 9 shows the number of failures per hour.

    After you view all failures, the switch dashes all fields. If you enter nc again, the summary appears.

3. To test a circuit that has failed, go to test 2.

4. If there are more failures repeat steps 2-4.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to send four test messages, go to test 2.

7. If you want to send a single test message, go to test 3.

8. If you want to send four test messages continuously, go to test 4.

To Resolve Alarms

You may want to resolve any invalid alarms from the ANI trunk failure history log.

   1. If you want to resolve all alarms, make sure that the failure summary is on your screen.

      If the failure summary is not on your screen, enter `x`
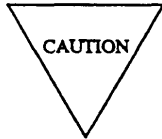
      ▽ CAUTION   Record all alarms before you resolve alarms from the log. Then you will have a switch failure history you can use for future troubleshooting.

   2. Enter `cdx` to resolve alarms.

      The switch marks ANI alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

   3. If you want to send four test messages, go to test 2.

   4. If you want to send a single test message, go to test 3.

   5. If you want to send four test messages continuously, go to test 4.

Test 2 - Operation

Use test 2 to send four test messages.

In test 2 you can:

View the test 2 screen   *page 5-106*

Send four test messages   *page 5-107*

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following.

   ● To start the procedure, enter p623

   ● If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 623, TEST: 2
         SEND FOUR TEST MESSAGES TO AN ANI TRUNK CIRCUIT

2. Data Message Sent: ❑

TRUNK EQUIPMENT LOCATION
   3.   Module: ❑
   4. Cabinet: ❑
   5. Carrier: ❑
   6.    Slot: ❑
   7. Circuit: ❑

8. Failure Cause: ❑




Connected to CC0 ON-LINE♥ ⌈ MAJOR ⌉⌈ MINOR ⌉⌈ RUN TAPE ⌉⌈ BUSY OUT ⌉⌈ IN USE ⌉⌈ WAIT ⌉

enter command: ▭
⌈      ⌉⌈      ⌉⌈F3 DATA⌉⌈      ⌉⌈F5 HELP⌉⌈F6 FIELD⌉⌈F7 INPUT⌉⌈F8 CMDS⌉
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send Four Test Messages

1. Connect the ANI test set to the circuit pack on your screen.

    If you do not know how to connect the ANI test set, go to *General Information — To Set Up the Test Set.*

    <div style="text-align:center;">▽ CAUTION</div>
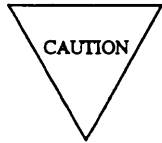
    Use an ANI test set so you do not send test messages to the central office. If the ANI trunk circuit is connected to the central office instead of the ANI test set, test messages may be recorded as valid ANI calls.

2. Make sure you have disconnected the tip and ring leads of the ANI trunk circuit at the cross-connect field.

3. Make sure that power is **OFF** on the ANI test set.

4. Connect the ANI test cable to the SN244 circuit pack in fields 3-6.

5. Enter `nc` until the ANI circuit you want to test appears.

6. At the test cable, set the **CHANNEL** switch to one of the following.

    -   If field 7 contains a 0, set the **CHANNEL** switch to 9.

    -   If field 7 contains a 1, set the **CHANNEL** switch to 8.

7. Enter `x` to send all four test messages.

    `WAIT` appears on your screen.

    The four test messages appear in the display field on the ANI test set.

    > Field 2 shows the test message sent (see Table 5-17).

    If you want to stop the test before all four messages are sent, enter `s`

    When `WAIT` disappears from your screen, field 8 shows the failure cause. If field 8 contains a 0, the test passed. The four test messages appear in the display field m the ANI test set.

    If the test passes the switch marks ANI alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

    If the test fails, if there is no data at the test set, or if the test data that was sent and the ANI test set display do not agree, the test failed

    > Field 2 shows the data message sent (see Table 5-17).

    > Fields 3-7 show the trunk equipment location.

    > Field 8 shows the failure cause (see Table 5-18).

8. Enter `nu` to see each failure cause.

    Field 8 shows the failure cause (see Table 5-18).

    After you view all failure causes, the switch dashes field 8. If you enter `nu` again, the first failure cause appears.

9. If there is an ANI trunk failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 21.

10. If this is not the last failure cause, repeat steps 8-10.

11. Connect the T and R leads at the cross-connect field.

12. If you want to examine the ANI failure history log or resolve alarms, go to test 1.

13. If you want to send a single test message, go to test 3.

14. If you want to send four test messages continuously, go to test 4.

Test 3 - Operation

Use test 3 to send a single test message continuously.

In test 3 you can:

View the test 3 screen	*page 5-109*
Send a single test message continuously	*page 5-110*

To View the Test 3 Screen

1. To see the test 3 screen choose one or both of the following:

    *   To start the procedure, enter p623
    *   If you are already in the procedure, but not in test 3, enter t3
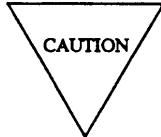
    The test 3 screen, similar to the following, appears.

```
┌────────────────────────────────────────────────────────────────┐
│             ENHANCED MODE - PROCEDURE: 623, TEST: 3             │
│           SEND A SINGLE TEST MESSAGE TO AN ANI CIRCUIT          │
│                                                                  │
│  2. Data Message Sent: ☐                                         │
│                                                                  │
│  TRUNK EQUIPMENT LOCATION                                        │
│    3.   Module: ☐                                                │
│    4.  Cabinet: ☐                                                │
│    5.  Carrier: ☐                                                │
│    6.     Slot: ☐                                                │
│    7.  Circuit: ☐                                                │
│                                                                  │
│  8. Failure Cause: ☐                                             │
│                                                                  │
│                                                                  │
│                                                                  │
│                                                                  │
│  Connected to CC0 ON-LINE ♥ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ] │
│                                                                  │
│  enter command: ▄                                                │
│  [_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS] │
└────────────────────────────────────────────────────────────────┘
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Single Test Message Continuously

1. Connect the ANI test set to the circuit pack you want to test.

    If you do not know how to connect the ANI test set, go to *General Information — To Set Up the Test Set.*

    Use an ANI test set so you do not send test messages to the central office. If the ANI trunk circuit is connected to the central office instead of the ANI test set, test messages may be recorded as valid ANI calls.

2. At the cross-connect field, disconnect the T and R leads of the ANI trunk circuit displayed in fields 3-7.

3. Make sure that power is **OFF** on the ANI test set.

4. Connect the ANI test cable to the SN244 circuit pack in fields 3-6.

5. Enter nc until the ANI circuit you want to test appears.

6. Enter nd to select a test data message.

        Field 2 shows the test message (see Table 5-17).

7. At the test cable, set the **CHANNEL** switch to one of the following:

    - If field 7 contains a 0, set the **CHANNEL** switch to 9.

    - If field 7 contains a 1, set the **CHANNEL** switch to 8.

8. Enter x to send the test message you selected.

9. Enter s to stop the test.

        Field 8 shows the failure cause (see Table 5-18). If field 8 contains a 0, the test passed.

    If field 8 does not contain a 0, if there is no data at the test set, or if the test data that was sent and the ANI test set display do not agree, the test failed.

        Field 2 shows the data message sent (see Table 5-17).

        Fields 3-7 show the trunk equipment location.

        Field 8 shows the failure cause (see Table 5-18).

10. Enter nu to see each failure cause.

    Field 8 shows the failure cause (see Table 5-18).

    After you view all failure causes, the switch dashes field 8. If you enter nu again the first failure cause appears.

11. If there is an ANI trunk failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 21.

12. If you want to send another test pattern, repeat steps 6-12.

13. Connect the T and R leads at the cross-connect field.

14. After you repair any failures, do test 2 so the switch can turn off **OTHER FAILS** on the common-control alarm panel.

15. If you want to examine the ANI failure history log or resolve alarms,go to test 1.

16. If you want to send four test messages, go to test 2.

17. If you want to send four test messages continuously, go to test 4.

Test 4 - Operation

Use test 4 to send four messages continuously.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen choose one or both of the following.

   ● To start the procedure, enter `p623`

   ● If you are already in the procedure, but not in test 4, enter t4

   The test 4 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 623, TEST: 4
                        CONTINUOUSLY TEST ANI CIRCUITS

  2. Data Message Sent: ▢

  TRUNK EQUIPMENT LOCATION
    3.   Module: ▢
    4. Cabinet: ▢
    5. Carrier: ▢
    6.    Slot: ▢
    7. Circuit: ▢

  8.       Failure Cause: ▢
  10. Number of Attempts: ▢




  Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT
  ─────────────────────────────────────────────────────────────────────────────
  enter command: ▬
  │        ││        ││F3 DATA  ││        ││F5 HELP ││F6 FIELD ││F7 INPUT ││F8 CMDS │
```

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send Four Messages Continuously

1. Connect the ANI test set to the circuit you want to test.

    If you do not know how to connect the ANI test set, go to *General Information — To Set Up the Test Set.*
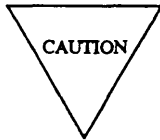
     Use an ANI test set so you do not send test messages to the central office. If the ANI trunk circuit is connected to the central office instead of the ANI test set, test messages may be recorded as valid ANI calls.

2. At the cross-connect field, disconnect the T and R leads of the ANI trunk circuit in fields 3-7.

3. Make sure that power is **OFF,** on the ANI test set.

4. Connect the ANI test cable to the SN244 circuit pack in fields 3-6.

5. Enter nc until the ANI circuit you want to test appears.

6. Enter nd to select a test data message.

    Field 2 shows the test messages (see Table 5-17).

7. At the test cable, set the **CHANNEL** switch to one of the following.

    - If field 7 contains a 0, set the **CHANNEL** switch to 9.

    - If field 7 contains a 1, set the **CHANNEL** switch to 8.

8. Enter x to send the test message you selected.

    The test runs until the switch finds a failure or until you enters

9. Enter s to stop the test.

    Run the test long enough to trace wiring problems associated with the SN244 circuit pack.

    Field 8 shows the failure cause (see Table 5-18). If field 8 contains a 0, the test passed.

    If field 8 does not contain a 0, if there is no data at the test set, or if the test data that was sent and the ANI test set display do not agree, the test failed.

    Field 2 shows the data message sent (see Table 5-17).

    Fields 3-7 show the trunk equipment location.

    Field 8 shows the failure cause (see Table 5-18).

    After you view all failure causes, the switch dashes field 8. If you enter nu again, the first failure cause appears.

10. If there is an ANI trunk failure, go to *DEFINTY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 21.

11. If you want to test another trunk circuit, repeat steps 5-11.

12. Connect the T and R leads at the cross-connect field.

13. After you repair any failures, do test 2 so the switch can turn off **OTHER FAILS** on the common-control alarm panel.

14. If you want to examine the ANI failure history log or resolve alarms, go to test 1.

15. If you want to send four test messages, go to test 2.

16. If you want to send a single test message, go to test 3.

TABLE 5-17

Field 2 Data Message Sent
0   = Line 0123 Trunk 4567
1   = Line 1357 Trunk 0246
2   = Line 2000 Trunk 3988
3   = Line 1010 Trunk 1010

TABLE 5-18

Field 8 Failure Cause		
0	=	Passed
1	=	No acknowledgment from the module control channel
2	=	2/5 error, transmission error, too many or too few bits set, that is, not a valid digit sent in transmitted data
3	=	Always busy, timer expires, no response yet from the receiving facility
4	=	No word shift, no response yet from the receiving facility
5	=	No loop current, no signals from the receiving facility
6	=	Wrong channel, address the correct channel
7	=	Bid error, the PBX could not get a response from the receiving facility or board not properly initialized

Procedure Fields

The meaning of the fields are:

2.   `Data Message Sent`   Shows the data messages the switch sends to the ANI trunk circuit. Table 5-17 shows the data messages sent to a line or a trunk.

3-7. `TRUNK EQUIPMENT LOCATION`   Shows the equipment location of the ANI trunk circuit.

8.   `Failure cause`   Shows why the trunk failed and the severity of the failure. Table 5-18 shows the failure causes.

9.   `Number of Failures Per Hour`   Shows the number of failures per hour for all circuits and for individual circuits.

10.   `Number of Attempts`   Shows the number of ANI calls attempted.

11.   `Load Errors`   Shows the number of load errors in the log. If field 11 contains a 99, there are 99 or more errors in the log.

12.   `Time Out Errors`   Shows the number of times that the maximum wait interval was exceeded. If field 12 contains a 99, there are 99 or more time-out errors in the log.

13.   `Transmission Errors`   Shows the number of transmission errors. If field 13 contains a 99, there are 99 or more transmission errors in the log.

14.   `Queue Overflow Errors`   Shows the number of queue overflow errors. If field 14 contains a 99, the queue overflowed 99 or more times.

PROCEDURE 624 - CONTACT INTERFACE TESTS

Purpose

Use Procedure 624 to test a single contact or all contacts on a contact interface circuit pack.

Tests

Procedure 624 has four tests.

- Use test 1 to test all contacts, one at a time, by opening and closing each contact once every second for five seconds.

- Use test 2 to test all contacts by closing each contact for five seconds.

- Use test 3 to test a single contact continuously by opening and closing the contact every second.

- Use test 4 to test a single contact by closing the contact.

Procedure Overview

The contact interface circuit pack (SN241) contains relays that switch devices on or off. These relays are also used in features such as centralized attendant service or to monitor trunk activity. In a DEFINITY Generic 2 the analog line circuit packs TN742 and TN746 can be used to provide the contact interface function.

Use Procedure 624 to test all eight contacts on the contact interface circuit pack. You can test a single contact or all contacts. You must be at the switch site so you can monitor any devices connected to each contact. After you use Procedure 624 the switch clears all system status indicators lamps from any previous state.

Use Procedure 620 Test 4 to test analog line circuit packs TN742 or TN746 if they are translated as contact interface circuit packs.

Use the following flowchart to guide you from test to test. You may want to remove it and refer to it as you use this procedure.

```
                    ( START )
                        |
                        |
        +---------------+<--------------------+
        |                                     |
        v                                     |
  +-------------+                    +------------------+
  | START TEST 1|                    |      GO TO        |
  | OR TEST 2 TO|                    | REPAIR STRATEGIES |
  |  TEST ALL   |                    |    DOCUMENT       |
  |  CONTACTS   |                    |   AND REPAIR      |
  +-------------+                    +------------------+
        |                                     ^
        |                                     |
        v                                     |
      /\                          +------------------+
     /  \       YES               |   START TEST 3   |
    / DOES \--------------------->|   OR 4 TO TEST   |
    \ A CONTACT /                 |   THE CONTACT    |
     \ FAIL? /                    |   THAT FAILED    |
      \  /                        +------------------+
       \/
        | NO
        |
        v
    ( END )
```
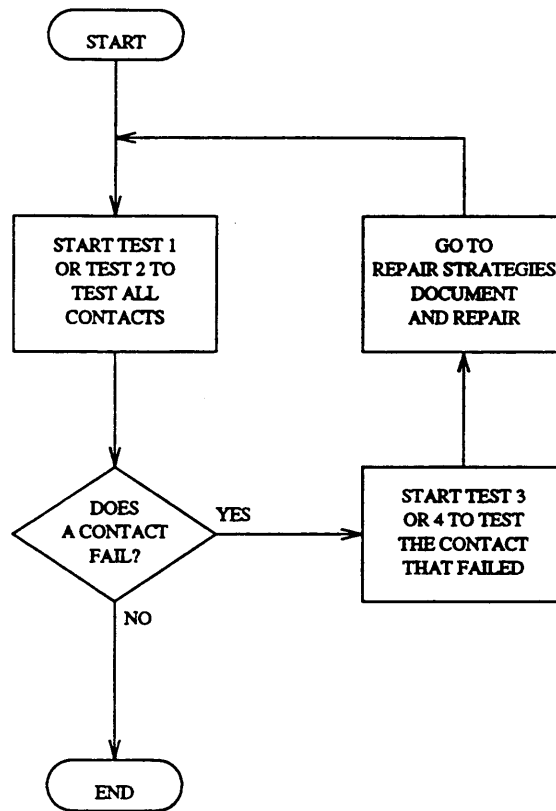
Figure 5-5. To Test a Contact Interface Circuit Pack

Test 1 - Operation

Use test 1 to test all contacts, one at a time, by opening and closing each contact once every second for five seconds.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure, but not in test1, enter `t1`

   ● Otherwise, enter `p624`

   The test 1 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 624, TEST: 1
          CYCLE ALL CONTACTS ON A CONTACT INTERFACE BOARD

 EQUIPMENT LOCATION                      15. Failure Code: ▢
    2.   Module: ▢
    3.  Cabinet: ▢
    4.  Carrier: ▢
    5.    Slot: ▢

  6. Current Contact: ▢


 CONTACT STATE
    7. Contact 0: ▢
    8. Contact 1: ▢
    9. Contact 2: ▢
   10. Contact 3: ▢
   11. Contact 4: ▢
   12. Contact 5: ▢
   13. Contact 6: ▢
   14. Contact 7: ▢

 Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

 enter command: ▭
 │         ││        ││ F3 DATA ││        ││ F5 HELP ││ F6 FIELD ││ F7 INPUT ││ F8 CMDS │
```

Fields 2-5 may show a default contact interface circuit pack from test 2, 3, or 4.

Field 6 contains a 0.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Contact Interface Circuit Pack

1. To select a contact interface circuit pack, choose from the following:

   - Enter cf2 and then enter the module, cabinet, carrier, and slot.

   - Enter nc to see each contact interface circuit pack.

     After you view all contact interface circuit packs, the switch dashes all fields. If you enter nc again, the first contact interface circuit pack appears.

2. Enter x to test the contact interface circuit pack.

   Each contact opens and closes once per second for five seconds before the next contact is selected. After all contacts are tested, the first contact closes again.

   Field 6 shows which contact is being tested.

   Fields 7-14 contain a 1 when the contact closes or a 0 when the contact opens.

   Field 15 may show a failure code (see Table 5-19).

   Look at each device connected to the contacts to ensure that it is on when the contact closes and off when the contact opens.

3. To stop the test, enter s

4. If any device is not working correctly test the contact interface circuit pack with test 2.

5. If you want to test another contact interface circuit pack repeat steps 1-5.

6. If you want to test a selected contact continuously go to test 3 or test 4.

Test 2 - Operation

Use test 2 to test all contacts by closing each contact for five seconds.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter `p624`

   - If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
        ENHANCED MODE - PROCEDURE: 624, TEST: 2
        CLOSE ALL CONTACTS ON A CONTACT INTERFACE BOARD


EQUIPMENT LOCATION                    15. Failure Code: ▢
   2.   Module: ▢
   3.  Cabinet: ▢
   4.  Carrier: ▢
   5.     Slot: ▢

  6. Current Contact: ▢


STATE OF CONTACTS ON BOARD UNDER TEST
   7. Contact 0: ▢
   8. Contact 1: ▢
   9. Contact 2: ▢
  10. Contact 3: ▢
  11. Contact 4: ▢
  12. Contact 5: ▢
  13. Contact 6: ▢
  14. Contact 7: ▢

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]


enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

Fields 2-5 may show a default equipment location from test 1, 2, or 3.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Contact Interface Circuit Pack

1. To select a contact interface circuit pack, choose from the following:

    • Enter cf2 and then enter the module, cabinet, carrier, and slot.

    • Enter nc to see each contact interface circuit pack.

    After you view all contact interface circuit packs, the switch dashes all fields. If you enter nc again, the first contact interface circuit pack appears.

2. Enter x to test the contact interface circuit pack.

    Each contact stays closed for five seconds before the next contact is selected. After all contacts are tested, the first contact closes again.

    Field 6 shows which contact is being tested.

    Fields 7-14 contain a 1 when the contact closes or a 0 when the contact opens.

    Field 15 may show a failure code (see Table 5-19).

    Look at each device connected to the contacts, to ensure that it is on when the contact closes and is off when the contact opens.

3. To stop the test, enter s

4. If any device is not working correctly go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 43.

5. If you want to test another contact interface circuit pack repeat steps 1-5.

6. If you want to test all contacts with a different test go to test 1.

7. If you want to test a selected contact continuously go to test 3 or test 4.

Test 3 - Operation

Use test 3 to test a single contact continuously by opening and closing the contact every second.

In test 3 you can:

View the test 3 screen

Test a selected contact continuously

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   ● To start the procedure, enter `p624`

   ● If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 624, TEST: 3
            CYCLE A SINGLE CONTACT ON A CONTACT INTERFACE BOARD

EQUIPMENT LOCATION                      15. Failure Code: ❑
   2.    Module:  ❑
   3.   Cabinet:  ❑
   4.   Carrier:  ❑
   5.     Slot :  ❑

 6. Current Contact: ❑

STATE OF CONTACT ON BOARD UNDER TEST
   7. Contact 0: ❑
   8. Contact 1: ❑
   9. Contact 2: ❑
  10. Contact 3: ❑
  11. Contact 4: ❑
  12. Contact 5: ❑
  13. Contact 6: ❑
  14. Contact 7: ❑

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT
─────────────────────────────────────────────────────────────
enter command: ▭
[        ][     ][F3 DATA ][      ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

Fields 2-5 may show a default equipment location from test 1, 2, or 4.

Field 6 may show a default contact.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Selected Contact Continuously

1. To select a contact interface circuit pack, choose from the following:

    ● Enter cf2 and then enter the module, cabinet, carrier, and slot.

    ● Enter nc to see each contact interface circuit pack.

      After you view all contact interface circuit packs, the switch dashes all fields. If you enter nc
      again, the first contact interface circuit pack appears.

2. Enter cf6 and enter the contact number you want to test.

3. Enter x to test the contact.

    The contact you selected opens and closes once per second until you enter s

      Field 6 shows which contact you selected.

      Field 7-14 contain a 1 when the contact closes or a 0 when the contact opens.

      Field 15 may show a failure code (see Table 5-19).

    Look at each device connected to the contacts, to ensure that it is on when the contact closes and off
    when the contact is open.

4. To stop the test, enter s

5. If any device is not working correctly go *DEFINITY™ Communications System Generic 2,
    Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 43.

6. If you want to test a different contact, repeat steps 2-6.

7. If you want to test another contact interface circuit pack repeat steps 1-7.

8. If you want to test all contacts on a contact interface circuit pack go to test 1 or test 2.

9. If you want to test a selected contact with a different test go to test 4.

Test 4 - Operation

Use test 4 to test a single contact by closing the contact.

In test 4 you can:

View the test 4 screen	*page 5-125*
Test a selected contact continuously	*page 5-126*

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

   ● To start the procedure, enter `p624`

   ● If you are already in the procedure, but not in test 4, enter `t4`

   The test 4 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 624, TEST: 4
         CLOSE A SINGLE CONTACT ON A CONTACT INTERFACE BOARD


EQUIPMENT LOCATION                  15. Failure Code: ⬚
   2.  Module: ⬚
   3. Cabinet: ⬚
   4. Carrier: ⬚
   5.    Slot: ⬚

 6. Contact: ⬚


STATE OF CONTACT ON BOARD UNDER TEST
   7.  Contact 0: ⬚
   8.  Contact 1: ⬚
   9.  Contact 2: ⬚
  10.  Contact 3: ⬚
  11.  Contact 4: ⬚
  12.  Contact 5: ⬚
  13.  Contact 6: ⬚
  14.  Contact 7: ⬚

Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▭
│_____││_____││ F3 DATA ││_____││ F5 HELP ││ F6 FIELD ││ F7 INPUT ││ F8 CMDS │
```

   Fields 2-5 may show a default equipment location from test 1,2, or 3.

   Field 6 may show a default contact.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Selected Contact Continuously

1. To select a contact interface circuit pack, choose from the following:

    ● Enter cf2 and then enter the module, cabinet, carrier, and slot.

    ● Enter nc to see each contact interface circuit pack.

      After you view all contact interface circuit packs, the switch dashes all fields. If you enter nc
      again, the first contact interface circuit pack appears.

2. Enter cf6 and enter the contact number you want to test.

3. Enter x to test the contact.

    The contact you selected stays closed until you enter s

      Field 6 shows which contact you selected.

      Field 7-14 contain a 1 when the contact closes or a 0 when the contact opens.

      Field 15 may show a failure code (see Table 5-19).

    Look at each device connected to the contacts, to ensure that it is on when the contact closes and off
    when the contact is open.

4. To stop the test, enter s

5. If any device is not working correctly go *DEFINITY™ Communications System Generic 2,
    Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 43.

6. If you want to test a different contact, repeat steps 2-6.

7. If you want to test another contact interface circuit pack repeat steps 1-7.

8. If you want to test all contacts on a contact interface circuit pack go to test 1 or test 2.

9. If you want to test a selected contact with a different test go to test 4.

TABLE 5-19

Field 15 Failure Code
9   =   The message transmission to the module processor failed.

Special Error Codes

While using Procedure 624 you may see the following special error codes:

- `80=Use Procedure 620 to test universal analog line boards.`

    You tried to test a universal analog line board circuit pack (TN742 or TN746). Use Procedure 620 to test these circuit packs when they are used as contact interface circuit packs.

Procedure Fields

The fields listed below are data entry fields.

- In all tests you can enter and equipment location in fields 2-5 to select a contact interface circuit pack.

- In test 3 and 4, you can enter a specific contact number on a contact interface circuit pack in field 6.

The meaning of the fields are:

2-5.	EQUIPMENT LOCATION	Shows the equipment location of the contact interface circuit pack.
6.	Current Contact or Contact	Shows which contact you selected to test.
7-14.	STATE OF CONTACTS ON BOARD UNDER TEST	Contains a 1 when the contact closes or a 0 when the contact opens. Look at the device connected to each contact to ensure that it is on when the contact is closed and is off when the contact is open.
15.	Failure Code	If a 9 appears the module processor did not receive the command you entered. Try again. Table 5-19 shows the failure encodes.

PROCEDURE 625 - SYNCHRONIZATION REFERENCE MONITOR TESTS

Purpose

Use Procedure 625 to find the health of synchronization references and all DS1, remote carrier group (RCG), or primary rate interface (PRI) circuit packs, to switch between synchronization reference sources, to disable or enable the automatic reference switching done by the synchronization periodic testing software, to view errored seconds information, to clear misframes for an individual board, and to clear all slips in the system.

Tests

Procedure 625 has two tests.

- Use test 1 to find the health and status of all DS1, RCG, or ISDN PRI circuit packs, to view errored seconds information, and to clear the misframes count.

- Use test 2 to switch between synchronization references, to see the time and cause of the last eight reference switches, to clear the switch history log, to reset the slip counts, and to disable or enable the automatic switch of references.

Procedure Overview

Use Procedure 625 to find the health of DS1, RCG, and ISDN PRI boards and see the errored seconds history. Every 15 minutes the switch software collects and processes errored seconds data.

Use Procedure 625 to:

- See the health and status information for each synchronization reference and DS1, RCG, or ISDN PRI circuit pack.

- Find the times and causes of the last eight reference switches of any synchronization reference.

- Clear the last eight reference switches from the log.

- Reset the misframes count to zero.

- Reset the slip count for all DS1, RCG, or ISDN PRI circuit packs in the switch.

- Switch between synchronization references.

- Turn on or off automatic reference switching.

- View errored seconds information.

● View the misframes count.

● View the slip count.
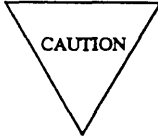
CAUTION Do not disable the automatic reference switching feature for a prolonged period of time or you could impair the recovery mechanism of the switch.

The six yellow LEDs on the system clock synchronizer (SCS) circuit pack (TN463) show you which reference is on line.

The LED in position one lights when the primary synchronization reference cannot be used because it is not sending a good signal to the SCS. The LED in position two lights when the secondary synchronization reference cannot be used because it is not sending a good signal to the SCS. LED positions 14, 15, and 16 show which reference is on-line. If the LED in position 14 is lit, the high accuracy clock (HAC) is on line. If the LED in position 15 is lit, the primary synchronization reference is on line. If the LED in position 16 is lit, the secondary synchronization reference on line.

You may want to disable automatic reference switching that may occur (if there are software or hardware failures), while troubleshooting network problems.

Test 1- Operation

Use test 1 to find the health and status of all DS1, RCG or ISDN PRI circuit packs, to view errored seconds information, and to clear the misframes count.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    - If you are already in the procedure, but not in test 1, enter t1

    - Otherwise, enter p625

    The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 625, TEST: 1
                  SYNCHRONIZATION REFERENCE MONITOR

  2. Digital Facility Type: ❑


 EQUIPMENT  LOCATION                  TIME STAMP
    3.  Module: ❑               13.  Stamp  Index: ❑
    4. Cabinet: ❑               14.        Day: ❑
    5. Carrier: ❑               15.       Hour: ❑
    6.    Slot: ❑               16.     Minute: ❑
                                17.      Cause: ❑


  7.  Reference Indicator: ❑
 10. Facility Fault Codes: ❑

 DATA
   11.    Facility Data Type: ❑
   12. Facility Data counts: ❑




 Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]


 enter command: ▬
 [          ][      ][ F3 DATA  ][      ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To See the Health and Status and View Errored Seconds

1. To select a DS1, RCG, or ISDN PRI circuit pack choose from the following:

   - Enter `nc` until the circuit pack you want to test appears.

     If there is a secondary reference, it follows the primary reference. After you view all DS1, RCG, or ISDN PRI circuit packs, the switch dashes fields 3-6. If you enter `nc` again, the first circuit pack appears.

   - Enter `cf3` and then enter the module, cabinet, carrier, and slot.

2. Enter `x` to find the health and status of the digital facility.

   Field 2 shows the digital facility type (see Table 5-20).

   Fields 3-6 show the equipment location of the synchronization reference, DS1, RCG, or ISDN PRI circuit pack.

   Field 7 shows the reference indicator (see Table 5-21).

   Field 10 shows the facility fault code (see Table 5-24). If field 10 contains a dash, the circuit pack is healthy.

   Field 11 shows what type of digital facility you are viewing (see Table 5-25).

   Field 12 shows the number of facility data counts for the facility type on your screen. The slip count appears first.

3. Enter `nf` to see each recorded facility fault code.

   After you view all facility fault codes, the switch dashes field 10. If you enter `nf` again, the first facility fault code appears.

4. To see other types of facility data, choose from the following:

   - To see the current 24-hour slip count, enter `nd` until field 11 contains a 1.

     Field 12 shows the current 24-hour slip count.

   - To see the current 1-hour misframes count, enter `nd` until field 11 contains a 2.

     Field 12 shows the current l-hour misframes count.

   - To see the current 1 hour errored seconds count, enter `nd` until field 11 contains a 3.

     Field 12 shows the current l-hour errored seconds count.

   - To see the previous 15-minute errored second count history, enter `nd` until field 11 contains a 4.

     Field 12 shows the last 15-minute errored second count history.

   - To see the last 24-hour errored seconds count, enter `nd` until field 11 contains a 5.

     Field 12 shows the last 24-hour errored seconds count in l-hour intervals.

5. If the facility fails, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-018) and follow the repair steps for unit type 68 for DS1, unit type 74 for RCG, and unit type 75 for ISDN PRI.

6. If you want to view the health and status for another facility repeat steps 1-6.

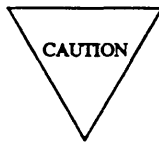7. If you want to clear the misframes count, go to *To Clear The Misframe Count.*

8. If you want to switch between synchronization references, see the time and cause of the last eight reference switches, clear the switch history log, reset the slip counts, or disable automatic reference switching, go to test 2.

To Clear the Misframes Count

The switch automatically clears misframes every hour. You should only clear misframes when you are diagnosing misframe errors.

1. If you want to clear the misframes count for a DS1 board, make sure that the facility data type shows the misframes count.

   If the misframes count is not on your screen, enter x and then enter nd until field 11 contains a 2. Field 12 shows the current misframes count.

   CAUTION   Record the misframes count before you clear it. Then you will have a history you can use for future troubleshooting.

2. Enter cdx to clear the misframes count.

        Field 12 contains a 0 when you clear the misframes count.

3. If you want to switch between synchronization references, see the time and cause of the last eight reference switches, enable or disable the automatic software reference switching capability, clear the switch history log, reset the slip count, or disable automatic reference switching, go to test 2.

Test 2 - Operation

Use test 2 to switch between synchronization references, to find the time and cause of the last eight
reference switches of the synchronization reference, to clear the table of last eight synchronization reference
switches, to enable or disable the automatic software reference switching capability, and to clear the slip
count in the switch.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    • To start the procedure, enter p625

    • If you are already in the procedure, but not in test 2, enter t2

        The test 2 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 625, TEST: 2
                     SYNCHRONIZATION  REFERENCE  MONITOR

 2. Digital Facility Type: ⬚


EQUIPMENT LOCATION
    3.  Module: ⬚
    4. Cabinet: ⬚
    5. Carrier: ⬚
    6.    Slot: ⬚
 7.     Reference Indication: ⬚
 8. Reference Switch Status: ⬚
 9. Automatic Switch Status: ⬚


TIME STAMP
  13.   Index: ⬚
  14.     Day: ⬚
  15.    Hour: ⬚
  16. Minute: ⬚
  17.   Cause: ⬚


Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |


enter command: ▭
|_____||_____|| F3  DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

The switch highlights field 8.

Field 2 shows the digital facility type (see Table 5-20).

Fields 3-6 show the equipment location of the on-line reference.

Field 7 shows the reference indicator (see Table 5-21).

Field 8 contains a 0 and a switch between references is disabled (see Table 5-22).

Field 13 shows the number of reference switches, up to eight. If there are no reference switches field 13 contains a 0.

Field 14-16 may show when the latest reference switch occurred.

Field 17 shows the health of the reference just before the reference switch (see Table 5-26).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Reference Switch History Log

1. Enter x to see when the last reference switchover occurred.

   Field 2 shows the facility type (see Table 5-20).

   Fields 3-6 show the equipment location of the reference.

   Field 7 shows the reference indication (see Table 5-21).

   Field 8 shows the switch status (see Table 5-22).

   Field 9 contains a 0 if an automatic switch between primary and secondary references is enabled.

   Field 13 contains a 0 or shows the number of switches that occurred (up to 8).

   Fields 14-16 show when the reference switch occurred.

   Field 17 shows the cause of the reference switchover and the health of the reference just before it was switched off-line (see Table 5-26).

2. Enter nd to see each reference switch time.

   Field 13 shows which reference switch you are viewing. The number in field 13 decreases by one as you view each reference switch.

   Fields 14-16 show when the reference switch occurred.

   Field 17 shows the health of the reference just before it was switched off-line (see Table 5-26).

3. If this is not the last reference switch, repeat steps 2-3.

   After you view all switches between primary and secondary references, the switch dashes fields 13-17. If you enter nd again, the first reference switch appears.

4. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 68 for DS1, unit type 74 for RCG, and unit type 75 for ISDN PRI.

5. If you want to reset slip counts, go to *To Reset Slip Counts.*

6. If you want to clear the reference switch log, go to *To Clear Reference Switches from the Log.*

7. If you want to switch to the HAC, go to *To Switch to the HAC.*

8. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and view
    errored seconds, or clear the misframes count, go to test 1.

To Clear Reference Switches from the Log

1. If you want to clear all reference switches from the log, make sure that the summary is on your
    screen.

    If the summary is not on your screen, enter x

2. If you want to clear a single reference switch from the log, make sure that the reference switch is on
    your screen.

    If the reference switch is not on your screen, enter x and then enter nc until the reference switch you
    want to clear appears.
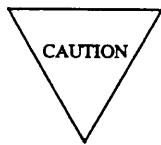
> ⚠ **CAUTION** Record all reference switches before you clear any from the log. Then you will have
> a reference switch history you can use for future troubleshooting.

3. Enter cdx to clear reference switches from the log.

    The switch dashes fields 13-17. The last eight reference switches are cleared from the log.

4. If you want to examine the reference switch history log, go to *To Examine the Reference Switch
    History Log.*

5. If you want to reset slip counts, go to *To Reset Slip Counts.*

6. If you want to switch to the HAC, go to *To Switch to the HAC.*

7. If you want to disable or enable reference switches, go to *To Disable or Enable Reference Switches.*

8. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and view
    errored seconds or clear the misframes count, go to test 1.

To Switch Between the Primary and Secondary Reference

1. To enable a switch between primary and secondary references, enter `cf8` and enter a 1

2. Enter x to switch between the primary and secondary reference.

    If the switch between references works, the following appears.

    > Field 2 shows the facility type (see Table 5-20).

    > Fields 3-6 show the equipment location of the new on-line reference.

    > Field 7 shows the reference indication (see Table 5-21).

    > Field 8 shows the switch status (see Table 5-22).

    > Field 9 contains a 0 if an automatic switch between primary and secondary references is enabled.

    > Field 13 contains a 0 or shows the number of switches that occurred (up to 8).

    > Fields 14-16 show when the reference switch occurred.

    > Field 17 shows the health of the reference just before it was switched off-line (see Table 5-26).

    The switch resets the system slip counts and logs the time and cause of the reference switch.

    The yellow LED in position 15 or 16 of TN463 shows which reference is on line. If the LED in position 15 is lit, the primary reference is on line. If the LED in position 16 is lit, the secondary reference is on line.

    If the reference switch failed, the following appears.

    > Fields 3-6 show equipment location of the original on line reference.

    > Field 8 shows the reference switch status (see Table 5-22).

   > Fields 13-17 show the time and cause of the last reference switch (see Table 5-26).

3. To ensure that the reference you switched on line stays on line, go to *To Disable or Enable Automatic Reference Switching* and disable automatic reference switching. Otherwise, the automatic recovery mechanism may switch back to the original reference.

4. If you want to examine the reference switch history log, go to *To Examine the Reference Switch History Log.*

5. If you want to reset slip counts, go to *To Reset Slip Counts.*

6. If you want to switch to the HAC, go to *To Switch to the HAC.*

7. If you want to clear the reference switch log, go to *To Clear Reference Switches from the Log.*

8. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and view errored seconds, or clear the misframes count, go to test 1.

To Disable or Enable Automatic Reference Switching
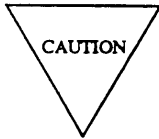
CAUTION   Do not disable the automatic reference switching feature for a long time or you could impair the recovery mechanism of the switch.

1. If you want to disable software automatic reference switching, enter `cf9` and then enter a `1`

2. If you want to disable hardware and software automatic reference switching, enter `cf9` and then enter a `2`

3. If you want to enable automatic reference switching, enter `cf9` and then enter a `0`

4. Enter `x` to disable or enable automatic reference switching (depending on the encode in field 9).

   If you disable both software and hardware switches (field 9 contains a 2), and quit Procedure 625, the switch automatically turns on the automatic hardware reference switch feature. Then the reference can switch to the high accuracy clock if the synchronization reference is lost or unusable. You will not see the change unless you start the procedure again.

5. If you disabled reference switching, repeat steps 3-5 to enable reference switching before you quit Procedure 625.

   If you leave Procedure 625 with automatic reference switching disabled (field 9 contains a 1 or a 2) a software reference switch cannot be done.

6. If you want to examine the reference switch history log, go to *To Examine the Reference Switch History Log.*

7. If you want to reset slip counts, go to *To Reset Slip Counts.*

8. If you want to clear the reference switch log, go to *To Clear Reference Switches from the Log.*

9. If you want to switch to the HAC, go to *To Switch to the HAC.*

10. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and to view errored seconds, and to clear the misframes count, go to test 1.

To Reset Slip Counts
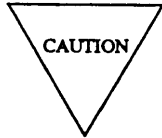
 Do not reset slip counts unless you are diagnosing slip count problems. The switch automatically resets slip counts every 24 hours.

1. Enter cf8 and enter 3 to enable a reset.

2. Enter x to reset the slip counts for all DS1 facilities.

    Field 8 contains a 0 (see Table 5-22).

3. If you want to examine the reference switch history log, go to *To Examine the Reference Switch History Log.*

4. If you want to clear the reference switch log, go to *To Clear Reference Switches from the Log.*

5. If you want to switch to the HAC, go to *To Switch to the HAC.*

6. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and to view errored seconds, and to clear the misframes count, go to test 1.

To Switch to the HAC

1. To enable a reference switch to the HAC, enter `cf8` and enter a 2 in field 8.

2. Enter `x` to switch to the HAC.

3. If you want to examine the reference switch history log, go to *To Examine the Reference Switch History Log.*

4. If you want to reset slip counts, go to *To Reset Slip Counts.*

5. If you want to clear the reference switch log, go to *To Clear Reference Switches from the Log.*

6. If you want to find the health and status of all DS1, RCG, or ISDN PRI circuit packs and to view errored seconds, and to clear the misframes count, go to test 1.

Special Error Codes

While using Procedure 625 the following special error codes may appear.

- `80=I/0 failure, try again.`

    Repeat test 1. If special error code 80 still appears,gotoProcedure 611 Test 2 to test the common control I/O channels and to Procedure 620 Test 4 to test the TN380 or TN580 (module processor) or TN381 (TMS processor).

- `81=The equipment location is not translated as a DS1 board.`

    The DS1 board you tried to test is not translated. Check translation.

- `82=This board is not a physical DS1 board.`

    The DS1 board you tried to test is not a physical board, since a DS1 circuit requires two circuit packs. Select the other circuit pack and test again.

- `84=Message response timeout for communication with a universal module.`

    You tried a command. The universal module did not receive the command. Try again.

TABLE 5-20

Field 2 Digital Facility Type		
1	=	DS-1 board
2	=	Remote group interface-central
3	=	Remote group interface-remote
4	=	Primary rate interface

TABLE 5-21

Field 7 Reference Indicator		
-	=	Circuit is not a reference
0	=	High accuracy clock
1	=	Primary reference
2	=	Secondary reference

TABLE 5-22

Field 8 Reference Switch Status		
0	=	Reference switch disabled
1	=	Enable switch of on-line reference
2	=	Enable switch to high accuracy clock
3	=	Enable reset slip counter
4	=	I/O failure
5	=	Unusable reference
6	=	Not administered
7	=	Maintenance busied

TABLE 5-23

Field 9 Automatic Switch Status		
0	=	Automatic reference switching enabled
1	=	Automatic software switch disabled
2	=	Automatic software and hardware switch disabled

Procedure Fields

The fields listed below are data entry fields.

- In test 1 and 2 you can select a specific equipment location in fields 3-6.

- In test 2 you can enable a synchronization reference switch or switch count reset in field 8.

- In test 2 you can enable or disable automatic synchronization reference switching in field 9.

The meaning of the fields are:

2.	Digital Facility Type	Shows which type facility you are viewing. Encodes 4 and 5 show a time stamp of the period on your screen. Table 5-20 shows the facility type encodes.
3-6.	EQUIPMENT LOCATION	Shows the equipment location of the on-line reference.
7.	Reference Indicator	Shows which reference is on-line. Table 5-21 shows the reference indication encodes.
8.	Reference Switch Status	Shows the status of the last reference switch. Encodes 4 to 7 appear if the switch between references failed. Table 5-22 shows the reference status encodes.
8.	Automatic Switch Status	Shows the status of the automatic switchover mechanism. If encodes 1 or 2 appear the switch may not be able to recover from reference failures. Service maybe interrupted. Table 5-23 shows the reference status encodes.
10.	Facility Fault Codes	Shows why the facility failed. Table 5-24 shows the facility fault code encodes.
11.	Facility Data Type	Shows the type of facility data you are viewing. Table 5-25 shows the facility data type encodes.
12.	Facility Data Counts	Shows the number of facility data counts for the facility type you are viewing. If the facility data type (in field 11) is type 3 or type 5, multiply the data count by 4 to get the correct count.
13-16.	TIME STAMP	Shows when the reference failed. The hour appears using a 24-hour clock.
17.	Cause	Shows why the facility was put out of service. Table 5-25 shows the cause codes.

TABLE 5-24

Field 10 Facility Fault Codes		
0	=	No fault
1	=	Board processor sanity
2	=	Unusable reference reported by system clock synchronizer (SCS)
3	=	Loss of signal reported by DS-1
4	=	Excessive slips
5	=	Excessive misframes
6	=	Board is not healthy
7	=	Major error rate alarm
8	=	Minor error rate alarm
9	=	Error rate 10E-4
10	=	Error rate 10E-5
11	=	Error rate 10E-6
12	=	Local multiframe alarm (LMA)
13	=	Remote multiframe alarm (RMA)
14	=	Red alarm (near-end loss of frame)
15	=	Yellow alarm (far-end loss of frame)
16	=	Blue alarm (facility out for maintenance)
17	=	Error in processor status register
18	=	Error in environment status register
19	=	Error in fiber status register
20	=	ISDN maintenance near-end
21	=	ISDN maintenance far-end
22	=	Maintenance busy
23	=	Board is not plugged in

TABLE 5-25

Field 11 Facility Data Type		
1	=	Current 24 hour slip count
2	=	Current 1 hour misframe count
3	=	Current 1 hour errored seconds count
4	=	Previous 15 minute errored seconds (history)
5	=	Previous 24 hours errored seconds (history)

TABLE 5-26

Field 17 Cause		
	=	Board is healthy
0	=	Switch requested by craft
1	=	Problem with board processor sanity
2	=	Unusable SCS reference
3	=	Signal loss by DS-1
4	=	Excessive slips
5	=	Excessive misframes
6	=	Carrier group alarm
7	=	Board not healthy
8	=	High accuracy clock (HAC) put on line
9	=	Last switch cause has cleared

PROCEDURE 627 - ISDN D-CHANNEL MAINTENANCE

Purpose

Use Procedure 627 (for nonfacility associated signaling (NFAS) only) to find the cause of the last 16 D-channel switchovers, to switch between the in-service and the standby D-channel, and to busy out or release a D-channel.

Tests

Procedure 627 has two tests.

- Use test 1 to find the time and cause of the last 16 D-channel switchovers.

- Use test 2 to switch between the in-service and the standby D-channel and to busy out or release a D-channel.

Procedure Overview

In an ISDN network the D-channel carries all signaling information. B-channels carry digitized voice and data service. The switch can use a single D-channel to provide signaling information for up to 479 B-channels in a nonfacility associated signaling (NFAS) arrangement.

To ensure that signaling is available for every B-channel it is a good idea to administer a backup D-channel. It is also a good idea to put the D-channels in different modules. If the primary D-channel fails, the switch places the backup D-channel in service.

Use Procedure 260 Word 1 and Word 2 to administer primary and backup D-channels. One D-channel is assigned as the primary D-channel and another D-channel is assigned as the backup D-channel. Either the primary or the backup D-channel may be in service. The D-channel that is not in service is called the standby D-channel.

You may want to use test 1 to examine the switchover log, to find why a D-channel failed, and to find the status of the D-channel.

You can use test 2 to switch a D-channel out of service if it is not functioning correctly. You can use test 2 to busy out an in-service or standby D-channel while fixing a problem on the D-channel. Then release the D-channel after you fix the problem.

Use the following flowcharts to guide you from test to test. You may want to remove the flowcharts and refer to them as you use this procedure.
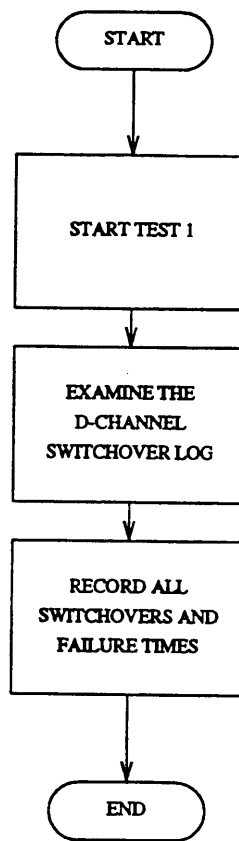
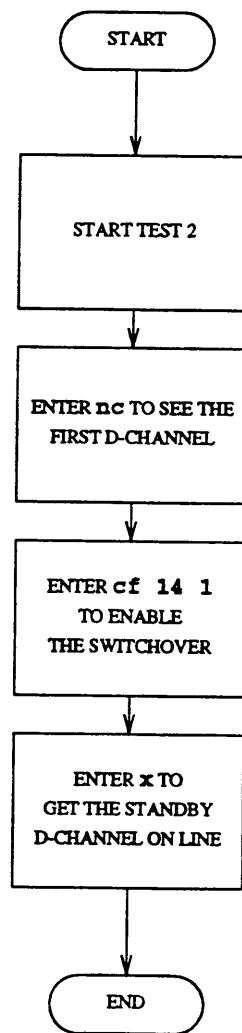**Figure 5-6.** To Find the Cause of the Last 16 Switchovers

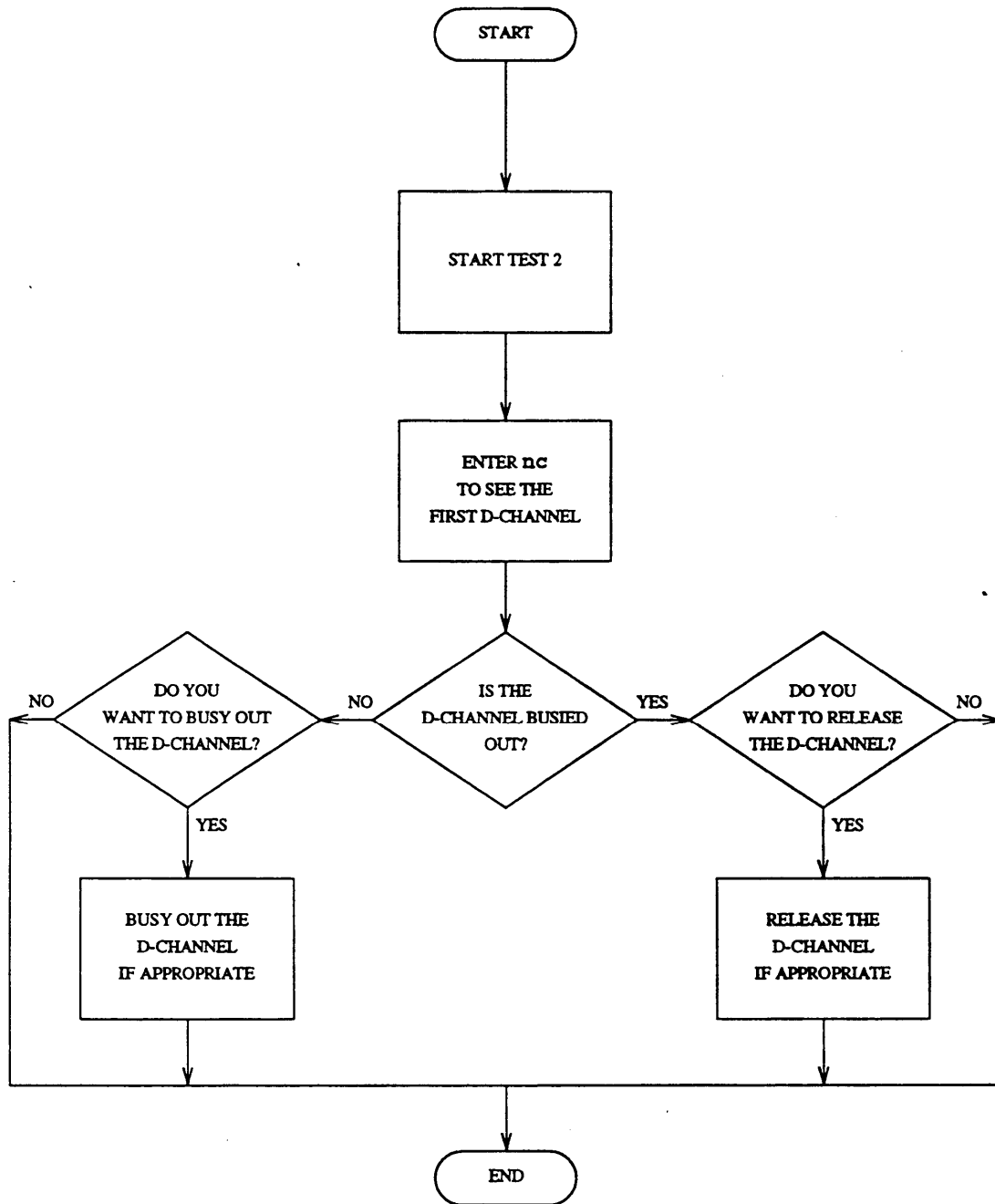**Figure 5-7.** To Switch Between the Primary and Backup D-Channel

```
                          ┌──────────┐
                          │  START   │
                          └────┬─────┘
                               │
                               ▼
                     ┌──────────────────┐
                     │                  │
                     │   START TEST 2   │
                     │                  │
                     └────────┬─────────┘
                              │
                              ▼
                     ┌──────────────────┐
                     │    ENTER nc      │
                     │   TO SEE THE     │
                     │ FIRST D-CHANNEL  │
                     └────────┬─────────┘
                              │
                              ▼
```

DO YOU WANT TO BUSY OUT THE D-CHANNEL?   NO →

IS THE D-CHANNEL BUSIED OUT?   NO →   YES →

DO YOU WANT TO RELEASE THE D-CHANNEL?   NO →

YES ↓

BUSY OUT THE D-CHANNEL IF APPROPRIATE

YES ↓

RELEASE THE D-CHANNEL IF APPROPRIATE

END

Figure 5-8. To Busy Out or Release a D-Channel

Test 1 - Operation

Use test 1 to examine the D-channel switchover log and find the time and cause of the last 16 D channel switchovers.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    If you are already in the procedure, but not in test 1, enter `t1`

    The test 1 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 627, TEST: 1
                EXAMINE ISDN D CHANNEL SWITCHOVER LOG


D CHANNEL EQUIPMENT LOCATION
    2.  Module: ▢              6. Backup Indicator : ▢
    3. Cabinet: ▢              7. D Channel Status: ▢
    4. Carrier: ▢
    5.    Slot: ▢

ALTERNATE D CHANNEL EQUIPMENT LOCATION
    8.  Module: ▢             12. Backup Indicator: ▢
    9. Cabinet: ▢             13. D Channel Status: ▢
   10. Carrier: ▢
   11.    Slot : ▢

SWITCH OVER TIME AND CAUSE
   15.    Day: ▢
   16.   Hour: ▢
   17. Minute: ▢
   18.  Cause: ▢


Connected to CC0 ON-LINE ♡ [ MAJOR ] [ MINOR ] [ RUN TAPE ] [ BUSY OUT ] [ IN USE ] [ WAIT ]

enter command: ▬
[        ] [        ] [F3 DATA] [        ] [F5 HELP] [F6 FIELD] [F7 INPUT] [F8 CMDS]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the D-Channel Switchover Log

1. Enter x to see the most recent entry in the switchover log.

    The switch sorts the switchover log by switchover time. The most recent entry appears first.

    > Fields 2-5 show the D-channel equipment location that was in service when the switchover occurred.

    > Field 6 contains a 0 if the circuit in fields 2-5 is the primary D-channel or a 1 if the circuit is the backup D-channel (see Table 5-27).

    > Fields 7 and 13 show the current status of the D-channel (see Table 5-28).

    > Fields 8-11 show the D-channel equipment location that was in standby when the switchover occurred.

    > Field 12 contains a 0 if the circuit in fields 8-11 is the primary D-channel, or a 1 if the circuit is the backup D-channel (see Table 5-27).

    > Fields 15-17 show the day, hour, and minute of the switchover.

    > Field 18 shows the cause of the switchover (see Table 5-30).

    If there are no switchovers in the log, all fields are blank except field 18.

2. Enter nc to view each switchover.

    The next most recent switchover appears.

    > Fields 2-5 show the D-channel equipment location that was in service when the switchover occurred.

    > Field 6 contains a 0 if the circuit in fields 2-5 is the primary D-channel or a 1 if the circuit is the backup D-channel (see Table 5-27).

    > Fields 7 and 13 show the current status of the D-channels (see Table 5-28).

    > Fields 8-11 show the standby D-channel equipment location at the time of switchover.

    > Field 12 contains a 0 if the circuit in fields 8-11 is the primary D-channel or a 1 if the circuit is the backup D-channel.

    > Fields 15-17 show the day, hour, and minute of the switchover.

    > Field 18 shows the cause of the switchover (see Table 5-30).

3. If this is not the last switchover, repeat steps 2 and 3.

    After you view all switchovers in the log, the switch dashes all fields. If you enter nc again, the most recent switchover appears.
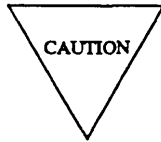
4. If you want to clear an entry from the log, go to *To Clear Entries from the D-Channel Switchover Log*.

5. If you want to switch between the in-service and standby D-channel or if you want to busy out or release a D-channel, go to test 2.

To Clear Entries from the D-Channel Switchover Log

You may want to clear any invalid entries from the switchover log.

1. Make sure that the entry is on your screen.

    If the entry is not on your screen, enter x and then enter nc until the entry you want to clear appears.

    Record all switchover entries before you clear them from the D-channel switchover log. hen you will have a switchover history you can use for future troubleshooting.

2. Type cdx to clear the entry from the D-channel switchover log.

3. If you want to switch between the in-service and standby D-channel or if you want to busy out or release a D-channel, go to test 2.

Test 2 - Operation

Use test 2 to switch between the in service and standby D-channels or to busy out or release a D-channel.

In test 2 you can:

To View the 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   ● To start the procedure, enter `p627`

   ● If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
         ENHANCED MODE - PROCEDURE: 627, TEST: 2
                ISDN - D CHANNEL MAINTENANCE


D CHANNEL EQUIPMENT= LOCATION
    2.  Module: ▯               6. Backup Indicator: ▯
    3. Cabinet: ▯               7. D Channel Status: ▯
    4. Carrier: ▯
    5.    Slot : ▯


ALTERNATE D CHANNEL EQUIPMENT LOCATION
    8.  Module: ▯              12. Backup Indicator: ▯
    9. Cabinet: ▯              13. D Channel Status: ▯
   10. Carrier: ▯
   11.    Slot: ▯


 14. Switch Over Enable Status: ▯




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[        ][    ][F3 DATA][    ][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

   Fields 2-5 may contain a default equipment location from test 1.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Switch Between the In-Service and Standby D-Channels

You may want to switch between D-channels to work on the facility that contains the in-service D-channel.

1. To select an equipment location, choose from the following:

   - Enter `cf2` and then enter the primary or backup D-channel equipment location in fields 2-5.

   - Enter `nc` until the primary D-channel you want to operate on appears.

      Fields 2-5 show the equipment location of the D-channel that is in service.

      Field 6 contains a 0 if the equipment in fields 2-5 is the primary D-channel or a 1 if the equipment is the backup D-channel (see Table 5-27).

      Fields 7 and 13 show the status of each D-channel on your screen (see Table 5-28).

      Fields 8-11 show the equipment location of the D-channel that is in standby.

      Field 12 contains a 0 if the equipment in fields 8-11 is the primary D-channel or a 1 if the equipment is the backup D-channel.

      Field 14 contains a 0, meaning that you cannot yet switch D-channels (see Table 5-29).

   After you view all D-channels, the switch dashes all fields. If you enter `nc` again, the first assigned D-channel appears.

2. To enable the switchover, enter `cf 14` and then enter a 1 in field 14.

3. Make sure that one D-channel is in standby (field 7 or 13 contains a 3) and the other D-channel is in service (the other status field contains a 2).

   If these states are not correct, go to *To Busy Out a D-Channel* or to *To Release a D-Channel from Busy.*

4. Enter `x` to start to switch the standby D-channel into service.

   Special error code 83 appears. You must enter x twice to switch the standby D-channel into service.

5. Enter x again to switch the standby D-channel into service.

      Fields 7 and 13 show the new status (see Table 5-28).

   If you have not entered a 1 in field 14, error code 84 appears. Change field 14 to a 1 and try again.

   If field 14 contains a 2, the D-channels are not in the proper states. One must be in in-service and the other in standby.

   The switch logs the D-channel switchover in the switchover log.

6. If you want to examine the switchover log, go to test 1.

7. If you want to release a D-channel from busy, go to *To Release a D-Channel*

8. If you want to busy out a D-channel, go to *To Busy Out a D-Channel.*

To Release a D-Channel from Busy

1. Make sure that fields 2-5 show the D-channel equipment location you want to release from busy.

If the fields 2-5 do not show the D-channel equipment location, enter `cf2` and enter the equipment location of the primary or backup D-channel you want to release from busy.

Fields 7 and 13 show the status of the in-service and standby D-channel (see Table 5-28).

2. Enter `rb` to release the D-channel from busy.

If you release a primary D-channel that was in standby it will stay in standby. If you want to get it back in smite, go to *To Switch Between the In-Service and Standby D-Channels.*

If the switch does not release the D-channel from busy, special error code 81 appears.

3. If you want to examine the switchover log, go to test 1.

4. If you want to switch between in-service and standby D-channels, go to *To Switch Between the In-Service and Standby D-Channels.*

To Busy Out a D-Channel
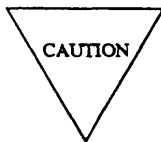
⚠ CAUTION   If you busy out a D-channel that is in service, all B-channels that use the D-channel lose their signaling channel.

1. Make sure that fields 2-5 show the D-channel equipment location you want to busy out.

If the fields 2-5 do not show the D-channel equipment location, enter `cf2` and enter the equipment location of the primary or backup D-channel you want to busy out.

Fields 2-5 show the equipment location of the D-channel you want to busy out.

Fields 7 and 13 show the status of the in-service and standby D-channels (see Table 5-28).

2. Enter `bo` to busy out the D-channel.

If you busy out a D-channel that is in service, the switch automatically tries to switch to the standby D-channel.

The switch busies out the D-channel even if there is no standby D-channel or if switch cannot enable the standby D-channel.

If the switch cannot busy out the channel, special error code 81 appears.

3. If special error code 85 or 86 appear, enter `bo` to busy out the D-channel.

The switch logs a manual busy out in the switchover history log.

4. If you want to switch between in-service and standby D-channels, go to *To Switch Between the In-*Service and Standby D-Channels.

5. If you want to examine the switchover log, go to test 1.

Special Error Codes

While using Procedure 627 you may see the following special error codes:

- `81=The message transmission to the module processor failed.`

  You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=Select a switchover entry and then enter cdx.`

  You tried to clear a range of switchovers from the log in test 1. Select a single switchover entry and then clear it.

- `83=You must enter x twice to do a switch over.`

- `84=Enter cf14 1 to enable a manual switch over.`

  You tried to switch between the in service and standby D-channel without enabling the switch over. Enter `cf14 1` to enable the switch over. Then enter x to switch between the in service and standby D-channels.

- `85=There is no backup D-channel.  Enter bo again to busy out.`

  You tried to busy out the in-service D-channel and there is no backup D-channel. Since there is no backup D-channel,you will interrupt service on all the D-channel's B-channels. Enter bo again if you still want to busy out the D-channel.

- `86=If you enter bo, both D-channels will be busied out.`

  You tried to busy out a D-channel and the backup D-channel is already out of service. Since the backup D-channel is out of service you will interrupt service on all the D-channels' B-channels. Enter bo again if you still want to busy out the D-channel.

- `87=Facility associated signaling entry logged.`

  In test 1 an entry in the switchover log is a facility associated signaling (FAS) equipment location. In test 2, you entered an equipment location of a FAS facility. Enter an NFAS facility equipment location and try again.

- `88=Invalid equipment location - may no longer be translated.`

  In test 1 there is an invalid equipment location in the switchover history log. This may occur if the facility is no longer translated. In test 2, you entered an incorrect equipment location. Enter a new location in fields 2-5.

- `89=ISDN is not turned on in Procedure 275 Word 4 or switch occupancy is high.`

TABLE 5-27

Field 6 and 12 Backup Indicator
0 = Primary D channel
1 = Backup D channel

TABLE 5-29

Field 14 Switch Over Enable Status
0 = Disable
1 = Enable
2 = Illegal

TABLE 5-28

Field 7 and 13 D-Channel Status
1 = Out of service
2 = In service
3 = Standby
4 = Forced busy by software
5 = Manual out of service
6 = Wait (transitory state)

TABLE 5-30

Field 18 Cause
0 = No switchovers in log
1 = Manually switched over
2 = Manually busied out
3 = Automatically busied out, ISDN level 2 failure
4 = Automatically busied out, download error
5 = Automatically busied out, by hyperactivity

Procedure Fields

The meaning of the fields are:

2-5.	D-CHANNEL EQUIPMENT LOCATION	In test l, fields 2-5 show the primary D-channel that was on-line at the time of the switchover. A D-channel is assigned as either primary or backup. Either the primary or backup D-channel can be on-line.
		In test 2, fields 2-5 show the equipment of a primary or backup D-channel you selected.
6.	Backup Indicator	Contains a 0 if the circuit in fields 2-5 is translated as the primary D-channel or a 1 if the circuit is translated as the backup D-channel. Either the primary or backup D-channel can be on-line. Table 5-27 lists the backup indicator encodes.
7.	D-Channel Status	Shows the current status of the D-channel circuit in fields 2-5. In test 1 the current status appears and not the status at the time of switchover. Table 5-28 shows the D-channel status encodes.
8-11.	ALTERNATE D-CHANNEL EQUIPMENT LOCATION	Shows the equipment location of the alternate D-channel. Either the primary or backup can be the alternate, depending on which D-channel is on-line.
12.	Backup Indicator	Contains a 0 if the circuit in fields 8-12 is translated as the primary D-channel or a 1 if the circuit in fields 8-12 is translated as the backup D-channel. Table 5-27 lists the backup indicator encodes.
13.	D-Channel Status	Shows the current status of the backup D-channel circuit. In test 1 the current status appears and not the status at the time of switchover. Table 5-28 shows the D-channel status encodes.
14.	Switchover Enable Status	Shows whether a switchover is allowed. To enable a switchover, enter cf14 and enter a 1. If encode 2 appears, you cannot do a switchover. One channel must be in service and the other in standby to do a switchover. If they are not in this state, release a channel from busy if necessary. Table 5-29 shows the switchover enable status encodes.
15-18.	SWITCHOVER TIME AND CAUSE	Shows when the switchover occurred. The hour is shown using a 24 hour clock.
18.	Cause	Shows why the D-channel switchover occured. Table 5-30 shows the switchover causes.

PROCEDURE 628 - UNIVERSAL BUS TESTS

Purpose

Use Procedure 628, in a universal module, to examine the time division multiplexed (TDM) and local area network (LAN) bus failure log, to resolve alarms, to test the TDM and LAN buses, to busy out or release a bus or call processing timeslots, and to switch the control channel and tone timeslots from one bus to another.

Tests

Procedure 628 has four tests.

- Use test 1 to examine the universal bus failure history log and to resolve failures.
- Use test 2 to test one or more busses.
- Use test 3 to test one or more busses continuously.
- Use test 4 to update the TDM bus status.

Procedure Overview

The DEFINITY Generic 2 has a universal module linked by a 4-MHz channel to the common-control. The universal module contains the universal module processor (UMP) and the universal bus interface (UBI).

The UBI allows the UMP to send and receive control messages to or from the port network The UBI controls port boards though two TDM busses. These busses are called bus A (sometimes called bus 1) and bus B (sometimes called bus 2). The UBI also interfaces to a LAN bus (sometimes called bus 3). Figure 5-9, *Universal Bus Structure,* shows these busses.
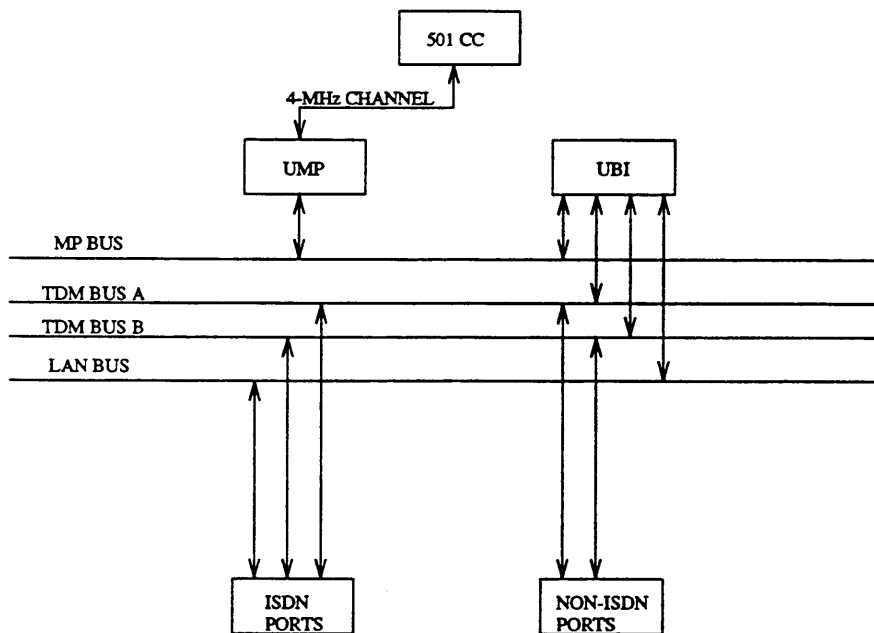
Figure 5-9. Universal Bus Structure

Each TDM bus contains a total of 256 timeslots, numbered sequentially from 0 to 255 (see Figure 5-10, TDM Bus Timeslot Assignment). The first five timeslots on each bus are reserved for the control channel, and cannot be assigned for any other purpose. Only one bus can be assigned as the control channel bus. The next 8 timeslots (timeslots 5-12), may be used for DTMF tones. Timeslots 13-32 may be used for system tones. The combination of DTMF and system tone time slots can be reserved for carrying tones on only one bus at a time. Timeslots 5-32 on the nontone bus (the bus that does not have active tones) can be used by call processing to carry calls during periods of heavy traffic. These timeslots, however, are selected as a last choice since switching tone busses may drop the calls on these timeslots.

Timeslot 254 on both busses is known as the quiet time slot and will never be used by call processing to carry a call.
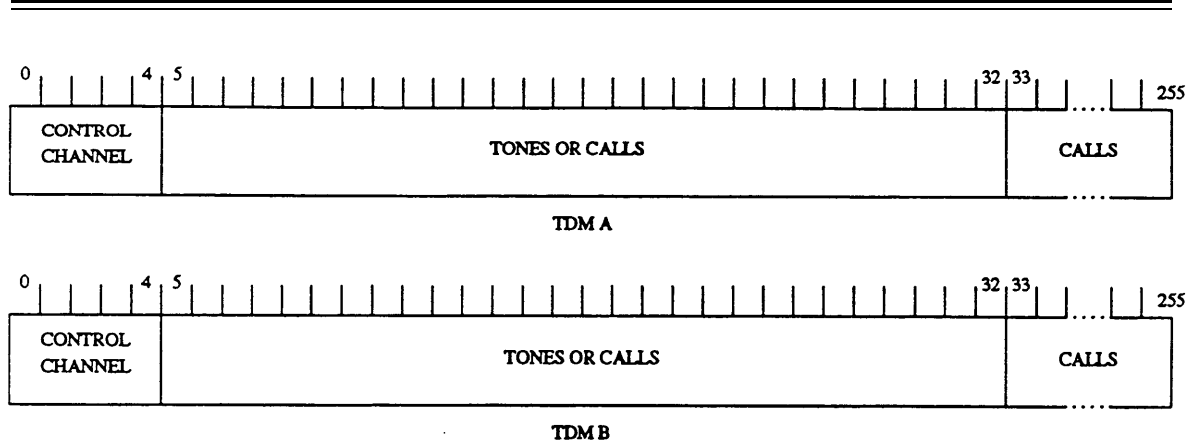
NOTE: ONLY ONE BUS CAN CARRY THE CONTROL CHANNEL. ONLY ONE BUS CAN CARRY TONES. CALL PROCESSING CAN USE TONE TIMESLOTS ON THE NONTONE BUS FOR CALLS.

Figure 5-10. TDM Bus Timeslot Assignment

A TDM bus maybe in service (IS) or out of service (OOS).
An out-of-service bus cannot be used to carry calls, tones or the control channels.
A maintenance busied bus cannot carry calls.
The control channel and tones, however, may still be active on a maintenance busied bus.
When a TDM bus is maintenance busied or taken out of service, any existing calls will remain on the bus until the call is terminated.

Periodic TDM/LAN bus tests are scheduled to run every two seconds on each universal module in the system.
All tests are nondestructive.
If a timeslot is bad, the idle timeslot test will busy it out or leave it busied out if it already is maintenance busy.
When you run a demand test on a bus with busied out timeslots, the busied out timeslots are tested before other timeslots are tested.
If the maintenance busied out time slots still fail, the switch leaves it busied out.
If the timeslot passes the test, it is released from maintenance busy.
The periodic test will not test busied out timeslots.

If a timeslot or TDM bus is busied out,
BUSY OUT
appears on your screen.

Tests 2 and 3 run the following tests on a TDM bus:

- A bus corruption test is run in the background by the archangel on the UBI board. The test looks at timeslot zero through four (the control-channel timeslots) for an error condition indicating that an angel is not releasing the bus. After reading the status, the archangel clears the bus A or bus B failure memory, and polls the buffer to see if a new error appears.

  The bus corruption test will run on an in-service (IS) or an out-of-service (OOS) TDM bus.

- A control channel loop test verifies that control messages can be transmitted on the control channel bus.

  Every five minutes (or whenever a bus board is inserted) the circuit pack ID and vintage are sent to the UMP. If the UMP detects a control channel loop test failure, either because there is no response or because there is an improper response, the control channel is indicted. If there are no translated port boards on a failing carrier, the failure message is ignored and the next carrier is tested.

  The control channel loop test only runs on the TDM bus that has the control channel on it. The control-channel loop test will run on an IS TDM bus only.

- An idle timeslot testis used to examine idle timeslots on a TDM bus and verify that they are silent.

  Maintenance busied timeslots are selected first. Next, timeslots are randomly selected (to test up to 10 timeslots). In either case, the timeslot must be made maintenance busy prior to testing. An idle tone detector port listens to each timeslot selected. If there is any noise, the timeslot is left maintenance busy. Otherwise the timeslot is released from maintenance busy. The bus is indicted when the first timeslot failure is detected.

  The idle timeslot test will run on either an IS or OOS TDM bus.

- A digit detection test is used to listen to each tone (digit) be generated. The tone generator/clock board generates 256 tones (0-255 digits) and the tone detector board listens to each of these tones. If the tone detector detects an unexpected tone, the test is repeated with a different tone/clock and tone detector (if available) to determine if the bus is at fault.

  The digit detection test will run on either an IS or OOS TDM bus.

If the bus being tested in test 2 or test 3 is a LAN bus, the LAN level 2 test is run. The LAN level 2 test is a loop-around test on a LAN bus. The test requests that the UMP send a test frame to an endpoint, through the D-channel, and verify the response.

To test the LAN bus, the switch must contain three LAN bus boards (either three basic rate interface (BRI) or three packet adjunct boards).

Use test 4 to find the various TDM bus configurations and busy states.

These include:

- Switching IS or OOS state for a TDM bus.
- Switching control channel on or off a TDM bUS.
- Switching tones on or off a TDM bus.
- Maintenance busy out or release a TDM bus from busy.
- Release all busied out timeslots on a TDM bus.

Test 1 - Operation

Use test 1 to examine the universal bus failure history log and to resolve alarms.

In test 1 you can:

View the test 1 screen	*page 5-163*
Examine the universal bus failure history log	*page 5-164*
Resolve alarms	*page 5-165*

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter `t1`

   - Otherwise, enter `p628`

   The test 1 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────┐
│ ┌──────────────────────────────────────────────────────────┐ │
│ │         ENHANCED MODE - PROCEDURE:  628, TEST:  1        │ │
│ │           EXAMINE  UNIVERSAL  BUS  FAILURE  HISTORY  LOG  │ │
│ │                                                          │ │
│ │ EQUIPMENT LOCATION                                       │ │
│ │                                                          │ │
│ │  2.   Module  Number: ☐                                  │ │
│ │  3.    Bus  Number: ☐                                    │ │
│ │                                                          │ │
│ │ STATUS                                                   │ │
│ │  7.   Alarm  Status: ☐                                   │ │
│ │                                                          │ │
│ │ 11.     Failure  Index: ☐                                │ │
│ │ 12.  Specific Fault Code: ☐                              │ │
│ │ 14.  Number of Bus Failures: ☐                           │ │
│ │                                                          │ │
│ │                                                          │ │
│ │                                                          │ │
│ │                                                          │ │
│ │                                                          │ │
│ │ Connected to CC0 ON-LINE ♡ │MAJOR││MINOR││RUN TAPE││BUSY OUT││IN USE││WAIT│ │
│ └──────────────────────────────────────────────────────────┘ │
│ enter command: ▭                                             │
│ │    ││    ││F3 DATA ││    ││F5 HELP ││F6 FIELD││F7 INPUT││F8 CMDS│ │
└──────────────────────────────────────────────────────────────┘
```

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Universal Bus Failure History Log

1. Enter x to sort the universal bus failure history log.

    Field 14 shows the total number of bus failures. If there are no failures, field 14 is blank.

2. Enter nc to see each failure.

    Field 2 shows the network module number.

    Field 3 shows the bus type (see Table 5-31).

    Field 7 shows the alarm status (see Table 5-35).

    Field 11 shows which alarm you are viewing. The number in field 11 decreases by one as you view each alarm.

    Field 12 shows the specific fault code. Record this number.

    Field 14 shows the number of busses that failed.

3. If there are any bus failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 81.

4. If this is not the last failure repeat steps 2-4.

    After you view all failures, the switch dashes all fields. If you enter nc again, the failure summary appears.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to test one or more busses, go to test 2.

7. If you want to test one or more busses continuously, go to test 3.

8. If you want to update the TDM bus status, go to test 4.

To Resolve Alarms

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nc until the alarm you want to resolve appears.

2. If you want to resolve all alarms, make sure that the failure summary is on your screen.

    If the failure summary is not on your screen, enter x
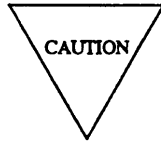
     CAUTION   Record all alarms, and their specific fault codes, before you resolve any alarms. Then you will have a alarm history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

    Field 7 contains a 5 if you resolved a single alarm (see Table 5-35).

    Field 11 shows the number of alarms still in the log. If you resolve all alarms, field 11 contains a 0.

    The switch marks all universal bus alarms resolved.

4. If you want to test one or more busses, go to test 2.

5. If you want to test one or more busses continuously, go to test 3.

6. If you want to update the TDM bus status, go to test 4.

Test 2 - Operation

Use test 2 to test one or more busses individually.

In test 2 you can

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter `p628`

   - If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 628, TEST: 2
                      TEST A SINGLE UNIVERSAL BUS


EQUIPMENT  LOCATION
    2. Module Number: ⬜
    3.     Bus Number: ⬜
STATUS
    4.           Bus Service Status: ⬜
    5.                  Tone Status: ⬜
    6.        Control Channel Status: ⬜
    8. Bus Maintenance Busy Status: ⬜

 9. Maintenance Busied Time Slots: ⬜
10.        Total Time Slots In Use: ⬜
FAILURE  INFORMATION
   11.           Failure Index: ⬜
   12.      Specific Fault Code: ⬜
   13. Number of Busses Tested: ⬜
   14.   Number of Bus Failures: ⬜


Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

Fields 2 and 3 may contain a default equipment location from test 1, or from Procedure 600.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Bus or a Range of Busses

1. To select a bus choose from the following:

   - If a module and a bus are already on your screen, enter `cf2` and then enter the module and bus number.

   - If you do not know the bus number, enter `nc` until the next bus or the first bus in the next testable universal module appears.

     After you view all universal modules, the switch dashes fields 2-14. If you enter `nc` again, the first testable module appears.

   - If you want to see the first bus in the next assigned universal module, enter `nu`

     After you view all assigned universal modules, the switch dashes fields 2-14. If you enter `nu` again, the first bus in the first testable module appears.

2. If you want to test all busses in the switch enter `cf2` and then enter ; ; to blank fields 2 and 3.

3. If you want to test all busses in a module, enter `cf2` and enter the module number in field 2 and then, enter ; to blank field 3.

4. Go to *To Test a Bus or a Range of Busses* to test the bus you selected.

To Test a Bus or a Range of Busses

1. Enter `x` to test the bus or a range of busses you selected.

   `WAIT` appears on your screen.

   If you are testing a LAN bus the switch dashes fields 2-12.

   > Field 2 shows the module number.

   > Field 3 shows the bus number (see Table 5-31).

   > Field 4 shows the bus service status if you are testing a TDM bus (see Table 5-32).

   > Field 5 shows the tone status if you are testing a TDM bus (see Table 5-33).

   > Field 6 shows the control channel status if you are testing a TDM bus (see Table 5-34).

   > Field 8 shows the bus maintenance busy status if you are testing a TDM bus (see Table 5-36).

   > Field 9 shows the maintenance busy time slots if you are testing a TDM bus.

   > Field 10 shows the number of timeslots in use by both TDM busses.

   > Field 11 shows which failure you are viewing.

   > Field 12 shows the specific fault code.

   > Field 13 shows the number of busses tested

   > Field 14 shows the total number of failures.

If you want to stop the test before the range is completely tested, enter s

Fields 2 and 3 show the original range you selected.

If you want to continue to test from where the test stopped, enter x

When the range is tested WAIT disappears from your screen.

2. Enter nc to see each bus failure.

Field 2 shows the module number.

Field 3 shows the bus number (see Table 5-31).

Field 4 shows the bus service status (see Table 5-32).

Field 5 shows the tone status (see Table 5-33).

Field 6 shows the control channel status (see Table 5-34).

Field 8 shows the bus maintenance busy status (see Table 5-36).

Field 11 shows which failure you are viewing.

Field 12 shows the specific fault code. Record this number.

Field 13 shows the number of busses tested.

Field 14 shows the number of bus failures.

3. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 81.

4. If this is not the last failure repeat steps 2-4.

After you view all failures, the switch dashes fields 2-14. If you enter nc again, the summary appears.

5. If you want to examine the failure history log, go to test 1.

6. If you want to test one or more busses continuously, go to test 3.

7. If you want to update the TDM bus status, go to test 4.

To Release All Busied-Out Timeslots or a Busied-Out TDM Bus

1. Make sure that you have selected a TDM bus.

2. Enter `rb` to release all maintenance busied timeslots or to release the TDM bus.

    If the bus does not have any busied out timeslots error code 22 appears. If you did not select a module or LAN bus, error code 10 appears.

    If the bus is out of service, special error code 88 appears. Go to test 4 and take bus out of service. This will automatically release the bus from maintenance busy.

3. If you want to examine the failure history log, go to test 1.

4. If you want to test one or more busses continuously, go to test 3.

5. If you want to update the TDM bus status, go to test 4.

Test 3 - Operation

Use test 3 to test one or more busses continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter `p628`

   - If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 628, TEST: 3
                   CONTINUOUSLY TEST A UNIVERSAL BUS


EQUIPMENT  LOCATION
     2. Module Number:  ⬚
     3.     Bus Number:  ⬚
STATUS
     4.          Bus Service Status:  ⬚
     5.                 Tone Status:  ⬚
     6.      Control Charnel Status:  ⬚
     8. Bus Maintenance Busy Status:  ⬚

  9. Maintenance Busied Time Slots:  ⬚
 10.       Total Time Slots In Use:  ⬚
FAILURE  INFORMATION
   11.          Failure Index:  ⬚
   12.             Fault Code:  ⬚
   13. Number of Busses Tested:  ⬚
   14.   Number of Times Failed:  ⬚



Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]
_____
enter command: ▭
[        ][        ][ F3 DATA ][        ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Fields 2 and 3 may show a bus equipment location from test 2.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Bus or a Range of Busses

1. To select a bus choose from the following:

    - If a module and a bus are already on your screen, enter `cf2` and then enter the module and bus number.

    - If you do not know the bus number, enter `nc` until the next bus or the first bus in the next testable universal module appears.

      After you view all universal modules, the switch dashes fields 2-14. If you enter `nc` again, the first testable module appears.

    - If you want to see the first bus in the next assigned universal module, enter `nu`

      After you view all assigned universal modules, the switch dashes fields 2-14. If you enter `nu` again, the first bus in the first testable module appears.

2. If you want to test all busses in the switch, enter `cf2` and then enter ; ; to blank fields 2 and 3.

3. If you want to test all busses in a module enter `cf2` and enter the module number in field 2 and then enter ; to blank field 3.

4. Go to *To Test a Bus or a Range of Busses* to test the bus or a range you selected.

To Test a Bus or a Range of Busses Continuously

1. Enter `x` to test the bus or a range of busses you selected.

    If you are testing a LAN bus the switch dashes fields 2-12.

    > Field 2 shows the module number.

    > Field 3 shows the bus number (see Table 5-31).

    > Field 4 shows the bus service status if you are testing a TDM bus (see Table 5-32).

    > Field 5 shows the tone status if you are testing a TDM bus (see Table 5-33).

    > Field 6 shows the control channel status if you are testing a TDM bus (see Table 5-34).

    > Field 8 shows the bus maintenance busy status if you are testing a TDM bus (see Table 5-36).

    > Field 9 shows the maintenance busy time slots if you are testing a TDM bus.

    > Field 10 shows the number of timeslots in use by both TDM busses.

    > The number in field 10 includes the total number of maintenance busied timeslots.

    > Field 11 shows which failure you are viewing.

    > Field 12 shows the specific fault code.

    > Field 13 shows the number of busses tested.

    > Field 14 shows the total number of failures.

2. To stop the test, enter s

    Fields 2 and 3 show the original range you selected.

    Field 14 shows the number of busses with failures.

3. Enter nc to see each bus failure.

    Field 2 shows the module number.

    Field 3 shows the bus number (see Table 5-31).

    Field 4 shows the bus service status (see Table 5-32).

    Field 5 shows the tone status (see Table 5-33).

    Field 6 shows the control channel status (see Table 5-34).

    Field 8 shows the bus maintenance busy status (see Table 5-36).

    Field 11 shows which failure you are viewing.

    Field 12 shows the specific fault code. Record this number.

    Field 13 shows the number of busses tested.

    Field 14 shows the number of bus failures.

4. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 81.

5. If this is not the last failure repeat steps 2-5.

    After you view all failures, the switch dashes fields 2-14. If you enter nc again, the summary appears.

6. If you want to examine the failure history log, go to test 1.

7. If you want to test one or more busses, go to test 2.

8. If you want to update the TDM bus status, go to test 4.

To Release All Busied-Out Timeslots or Release a Busied-Out TDM Bus

1. Make sure that you have selected a TDM bus.

2. Enter `rb` to release all maintenance busied timeslots or to release the TDM bus.

   If the bus does not have any busied out timeslots, error code 22 appears. If you did not select a module or LAN bus, error code 10 appears.

   If the bus is out of service, special error code 88 appears. Go to test 4 and take bus out of service. This will automatically release the bus from maintenance busy.

3. If you want to examine the failure history log, go to test 1.

4. If you want to test one or more busses, go to test 2.

5. If you want to update the TDM bus status, go to test 4.

Test 4 - Operation

Use test 4 to update the TDM bus status.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

    ● To start the procedure, enter p628

    ● If you are already in the procedure, but not in test 4, enter t4

    The test 4 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 628, TEST: 4
                        UPDATE TDM BUS STATUS


EQUIPMENT LOCATION
   2. Module Number: ▢
   3.    Bus Number: ▢


STATUS
   4.           Bus Service Status: ▢
   5.                  Tone Status: ▢
   6.       Control Channel Status: ▢
   8. Bus Maintenance Busy Status: ▢

 9. Maintenance Busied Time Slots: ▢
10.       Total Time Slots In Use: ▢





Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

Fields 2 and 3 may contain a default bus equipment location from tests 1, 2, or 3.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a TDM Bus

1. To select a single TDM bus, choose from the following:

   - If a module and a bus are already on your screen, enter cf2 and then enter the module and bus number.

   - If you do not know the bus number, enter nc until the next bus or the first bus in the next testable universal module appears.

     After you view all modules, the switch dashes fields 2-10. If you enter nc again, the first testable module appears.

   - If you want to select the first bus in the next testable module, enter nu

     After you view all modules, the switch dashes fields 2-10. If you enter nu again, the first bus in the first testable module appears.

To Busy Out a TDM Bus

1. Make sure that you have selected a TDM bus.
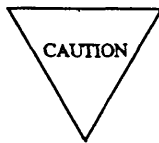
   CAUTION   When you busy out a TDM bus the number of timeslots available for call processing will be cut approximately in half for the module.

2. Enter bo **bo** to busy out the TDM bus.

   If you want to escape from a busy out operation, enter s after the first busy out.

   You must enter bo twice to busy out a TDM bus.

   If the bus is already busied out, error code 21 appears.

   Special error code 80 appears briefly in the message line.

   The switch busies out the TDM bus.

   Field 9 shows the number of timeslots which have been busied out.

   BUSY OUT appears on your screen.

3. If you want to examine the bus failure history log, go to test 1.

4. If you want to test one or more busses, go to test 2.

5. If you want to test one or more busses continuously, go to test 3.

To Release All Busied Timeslots or Release a Busied-Out TDM Bus

1. Make sure that you have selected a TDM bus.

2. Enter `rb` to release all maintenance busied timeslots or to release the TDM bus.

    If the bus does not have any busied out timeslots, error code 22 appears. If you did not select a module or LAN bus, error code 10 appears.

    If the bus is out of service, special error code 88 appears. Go to test 4 and take bus out of service. This will automatically release the bus from maintenance busy.

3. If you want to examine the failure history log, go to test 1.

4. If you want to test one or more busses, go to test 2.

5. If you want to test one or more busses continuously, go to test 3.

To Update the Bus Service Status

You can change the bus service status, tone status, or control channel status in fields 4-6.

1. Enter `cf` and the number of the field you want to change.

   Enter a 1 to enable the status or a 0 to disable the status.

2. Enter x to update the bus service status.

   `WAIT` appears on your screen. The bus on your screen is reconfigured.

   After the switch reconfigures the bus, `WAIT` disappears from your screen.

   If tone timeslots are in-use or maintenance busy on a nontone bus, and tones are being switched to that bus or the nontone bus is being switched out of service, special error code 84 appears on your screen.
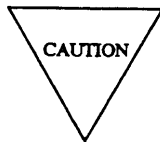
   ▽ CAUTION   If tones are switched to a bus which is currently using the tone time slots for call processing, a module processor initialization will occur on a second execute and all unstable calls will be dropped. Also, some stable calls may also be dropped. If the switch is busy you may want to wait and update the bus when switch traffic is not heavy.

   If you want to escape from a possible initialization, enters

3. If you want to change the status, enter x again.

   If special error code 95 or 96 appears the new control channels or tone timeslots are defective.   Do test 2 or 3 to test the control channel or tone timeslots on the bus. Then run test 4 to update the status.

4. If you want to examine the failure history log or resolve alarms, go to test 1.

5. If you want to test one or more busses, go to test 2.

6. If you want to test one or more busses continuously, go to test 3.

Special Error Codes

While using Procedure 628 you may see the following special error codes:

- `80=Enter bo twice to busy out a TDM bus. The call processing capacity of module will be cut in half.`

    You are trying to busy out a bus. You have to enter bo twice to busy out a bus. If you busy out a TDM bus, the call processing capacity will be cut in half.

- `81=The message transmission to the module processor failed.`

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=DMIDS overflowed due to the number of failures, before the range was completely tested.`

    You are testing a range and there are so many failures that DMIDS filled up. The test stops. If field 14 contains a 99, there are 99 or more failures. Enter nc to examine each failure.

- `83=The other TDM bus is out of service.`

    You tried to switch tone timeslots or control channels to a TDM bus that is OOS. Place the bus back into service and then switch the tone timeslots or control channels to the bus.

- `84=When you enter x again, the module processor will be initialized.`

    You tried to switch tones to a bus in which the tone timeslots on the nontone bus are in use or maintenance busied. If you enter x , all unstable calls, and possibly some stable calls will be dropped. Enter x again if you really want to switch to the non tone bus.

- `85= There are no universal modules in the system.`

    You tried to test a universal bus but there are no universal modules in the system.

- `87=The module processor has been initialized.`

    Appears to confirm that the module processor has been initialized.

- `88=You cannot release busied time slots in an out of service bus.`

    You tried to release time slots from busy and the bus is out of service. Place the bus back in service and all maintenance busy time slots will be released from busy.

- `89=Only one bus can be out of service in a module.`

    You tried to place a TDM busy out of service when the other bus in the module is out of service. Place the other bus in service if you really want to busy out this bus.

- `9O=The control channel for the other bus is unusable.`

    You tried to switch the control channel onto a bus whose control channel is not usable. Execute test 2 using the new control channel to test the other bus.

- 91=The tone time slots for the other bus are unusable.

  You tried to switch the tone timeslots onto a bus whose tone timeslots are not usable. Execute test 2 using the tone timeslots to test the other bus.

- 92=You cannot busy out a TDM bus that is out of service.

  You tried to busy out a bus that is out of service. Place the bus back into service, and then if you want to busy out the bus, busy it out.

- 93=You entered s to before the range was completely tested.

  You stopped the test before the switch tested the range once. Enter nc to examine each failure. Enter x to continue testing the range, or select a new range.

- 94=You cannot put control channels or tones on a bus that is out of service.

- 95=The control channel for the bus on your screen is unusable.

  Go to test 2 and test the control channel of the bus on your screen.

- 96=The tone time slots for the bus on your screen is unusable.

  Go to test 2 and test the tone timeslots of the bus on your screen.

- 97= Non-conclusive results due to tone source switch. Re-execute test.0 tone source switch recently occurred, possibly during the course of this test's execution. Re-run this test to determine if a failure does in fact exist.

Procedure Fields

The following are data entry fields.

- In tests 2-4 you can enter a module number and bus number in fields 2 and 3.
- In test 4 you can enter a new bus service status, or control channel status in fields 4-6.

The meaning of the fields are:

2-3.	EQUIPMENT LOCATION	Shows the module and bus number of the universal bus on your screen.
		A dash in the module number and bus number field will test all universal busses in the system. A dash in the module number field and a bus in the bus number field will test the specified bus on all universal modules in the system. A module number in the module number field and a dash in the bus number field will test all universal busses in the specified module.

4.   Bus Status or   Shows the bus service status. A TDM bus can be placed out of
       Bus Service   service by failures detected by periodic TDM bus tests or on demand
       Status   using this procedure. If the bus has been taken out of service, BUSY
                        OUT appears on your screen and field 4 indicates the OOS condition.
                        Table 5-32 shows the bus status encodes.

TABLE 5-31

Field 3 Bus Number
1 = Universal TDM bus A
2 = Universal TDM bus B
3 = Universal LAN bus

TABLE 5-32

Field 4 Bus Service Status
0 = Out of service
1 = In service

TABLE 5-33

Field 5 Tone Status
0 = Nontone bus
1 = Tone bus

TABLE 5-34

Field 6 Control Channel Status
0 = Noncontrol channel bus
1 = Control channel bus

TABLE 5-35

Field 7 Alarm Status
1 = Major
2 = Minor
3 = Warning
4 = Errors recorded
5 = Alarm resolved

TABLE 5-36

Field 8 Bus Maintenance Busy Status
0 = Bus is not maintenance busy
1 = Bus is maintenance busy

5.	Tone Status	Shows whether the bus has dedicated tone timeslots on it. Table 5-33 shows the tone status encodes.
6.	Control Channel Status	Shows whether the bus has control channels on it. Table 5-34 shows the control channel status encodes.
7.	Alarm Status	Shows the alarm status of alarms logged against the bus. Table 5-35 shows the alarm status encodes.
8.	Bus Maintenance Busy Status	Shows the maintenance busy status of the bus. A maintenance busied bus can carry control channel messages or tones. An OOS bus cannot carry control channel messages or tones. Table 5-36 shows the maintenance busy status encodes.
9.	Maintenance Busied Time Slots	Show the number of timeslots that are maintenance busy for the bus on your screen. A time slot can be maintenance busied out by failures detected by both periodic and demand TDM bus tests. If a timeslot is maintenance busy BUSY OUT appears on your screen.
10.	Total Time Slots in Use	Shows the total of time slots in use by call processing for both TDM busses and also the number of time slots maintenance busied for both busses.
11.	Failure Index	Shows which bus failure you are viewing.
12.	Specific Fault Code or Fault Code	Shows the specific fault code. Specific fault codes help to diagnose hardware and software problems. Record this number. It will be useful to those who diagnose switch software problems.
13.	Number of Busses Tested	Show the number of busses that were tested.
14.	Number of Bus Failures or Number of Times Tested	Show the number of busses with failures.

PROCEDURE 631- TRUNK GROUP BUSY OUT

Purpose

Use Procedure 631 to find the status of a trunk or all trunks in a trunk group, and to busy out or release from busy a trunk or all trunks in a trunk group.

Tests

Procedure 631 has two tests.

- Use test 1 to find the maintenance busy status of a trunk group, to busy out a trunk group, or to release a trunk group from maintenance busy.

- Use test 2 to find the trunk group number of a trunk, to busy out a trunk, or to release a trunk from busy.

Procedure Overview

If a trunk is busied out there maybe a major service loss in the switch. The switch ignores all busied-out trunks for call processing. Use Procedure 631 to find the busied-out trunk and place the trunk back in service.

The switch may automatically busy out a port if an internal periodic, demand, or audit test fails. The switch may busy out a port when you do a maintenance demand test. You can busy out a port while using some administration or maintenance procedures. The switch can busy out a port during call processing or at the request from a far end switch (for ISDN primary rate interface (PRI)).

You may have to find all busied out trunks or trunk groups in the switch. After you find why a trunk is busied out, you can fix the problem and release the trunk from busy. It is a good practice to check with the system administrator and check the written switch history log before you release a trunk from busy. The trunk may have been busied out for a valid reason.

You may have to busy out a trunk or a trunk group until you can correct a problem in the switch. You can busy out a specific trunk or an entire trunk group with Procedure 631.

Procedure 631 may direct you to Procedures 635 or 648 to check the maintenance busy status of a trunk or trunk group.

Use the following flowchart to guide you from test to test, and help you select the test you want. You may want to remove the flowchart and refer to it as you use this procedure.
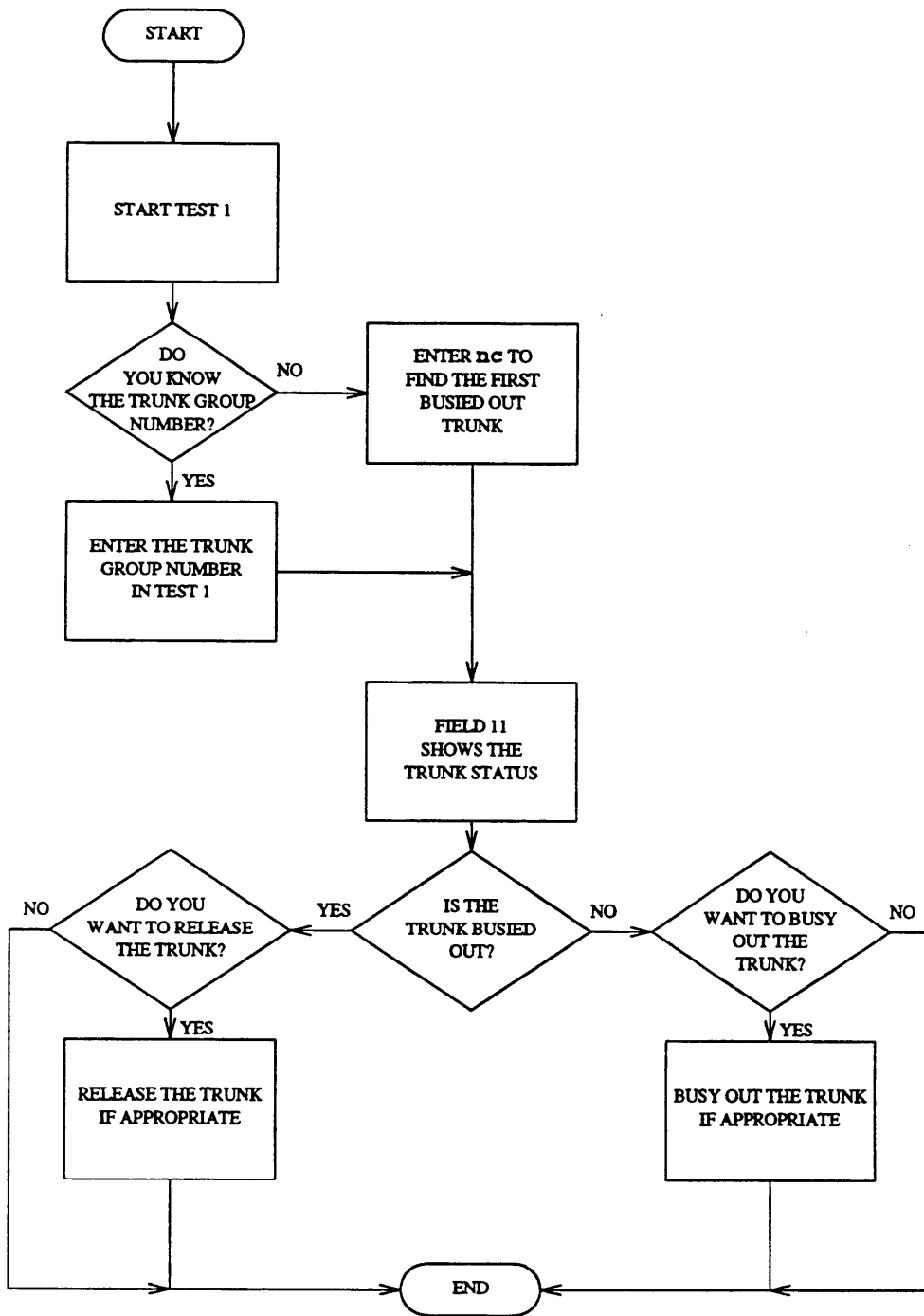
Figure 5-11. To Find the Status of a Trunk

Test 1 - Operation

Use test 1 to find the status of a trunk group, to busy out a trunk group, or to release a trunk group from busy.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   • If you are already in the procedure, but not in test 1, enter `tl`

   • Otherwise, enter `p631`

   The test 1 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 631, TEST: 1
                  BUSY OUT A TRUNK GROUP

 2.            Trunk Group Number: ▯
 6. Number of Trunks In Trunk Group: ▯
 7.      Number of Busied-Out Trunks: ▯


EQUIPMENT LOCATION
   8.    Module: ▯
   9.   Cabinet: ▯
  10.   Carrier: ▯
  11.      Slot: ▯
  12.   Circuit: ▯

13. Maintenance Status: ▯
14.      Trunk Number: ▯




Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▭
┌──────┐┌────┬──────┐┌──────┬───────┐┌───────┬────────┐┌───────┬────────┐
          F3 DATA        F5 HELP    F6 FIELD   F7 INPUT  F8 CMDS
```

Field 2 shows the number of the smallest assigned trunk group.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Find the Status of a Think Group

1. To select a trunk group choose, from the following:

   ● Enter `nu` until the trunk group you want to test appears infield 2.

     After you view the highest assigned trunk group, the switch dashes fields 2-11. If you enter `nu` again, the smallest trunk-group number appears.

   ● Enter `cf2` and then enter the trunk group number in field 2.

2. Enter `x` to find the status of the trunk group on your screen.

     `WAIT` appears on your screen.

       Field 2 shows the trunk group number.

       Field 6 shows the number of trunks in the trunk group.

       Field 7 shows the number of busied out trunks in the trunk group.

       Fields 8-12 show the equipment location of the first trunk in the trunk group.

       Field 13 shows the maintenance busy status of the first trunk (see Table 5-37).

       Field 14 shows which trunk you are viewing.

3. If you want to busy out the trunk group on your screen, go to *To Busy Out a Trunk Group.*

4. If you want to release the trunk group on your screen, go to *To Release a Trunk Group From Busy.*

5. If you want to examine a single trunk in a trunk group, go to test 2.

To Busy Out All Trunks in the Trunk Group

1. Make sure that you have selected a trunk group to busy out.

> Field 3 shows the total number of trunks in the trunk group.
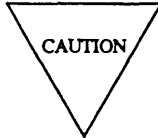
CAUTION   Entering bo will drop all calls in the trunk group.

> If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

>> Field 13 contains a 1 when the ISDN trunk is busied out at the near end.

2. Enter bo to busy out all trunks in the trunk group.

> Field 7 shows the number of busied out trunks in the trunk group.

> Field 13 contains a 1 when all trunks in the trunk group are busied out.

3. If you want to release the trunk group, go to *To Release a Trunk Group from Busy.*

4. If you want to examine a single trunk in a trunk group, go to test 2.

To Release a Trunk Group from Busy

1. Make sure that you have selected a trunk group to release from busy.

> If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. To release the trunk group from busy, enter rb

> WAIT appears on your screen.

>> Field 13 contains a 0.

3. If you want to find the status of a trunk, go to test 2.

Test 2 - Operation

Use test 2 to find the status and the trunk group number of a trunk, to busy out a trunk, or to release a trunk from busy.

In test 2 you can:

View the test 2 screen	*page 5-188*
Find the status of a trunk	*page 5-189*
Busy out a trunk	*page 5-189*
Release a trunk from busy	*page 5-190*

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   • If you want to start the procedure, enterp631

   • If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────┐
│         ENHANCED MODE - PROCEDURE: 631, TEST: 2              │
│                    BUSY OUT A TRUNK                          │
│                                                             │
│  2.          Trunk Group Number: ▢                          │
│  6. Number of Trunks in Trunk Group: ▢                      │
│  7.     Number of Busied-Out Trunks: ▢                      │
│                                                             │
│ EQUIPMENT LOCATION                                          │
│    8.  Module: ▢                                            │
│    9. Cabinet: ▢                                            │
│   10. Carrier: ▢                                            │
│   11.    Slot : ▢                                           │
│   12. Circuit: ▢                                            │
│                                                             │
│ 13. Maintenance Status: ▢                                   │
│ 14.    Trunk Number: ▢                                      │
│                                                             │
│                                                             │
│                                                             │
│ Connected to CC0 ON-LINE ♡ [MAJOR] [MINOR] [RUN TAPE] [BUSY OUT] [IN USE] [WAIT] │
│                                                             │
│ enter command: ▭                                            │
│ [_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS] │
└─────────────────────────────────────────────────────────────┘
```

Field 2 may show the equipment location of the first trunk in the last trunk group from test 1.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To End the Status of a Trunk

1. To select a trunk choose from the following:

    - Enter nc until the trunk you want to test appears.

      After you view all trunks in the trunk group, the switch dashed fields 8-12. If you enter nc again, the first trunk appears.

    - Enter cf8 and then enter the module, cabinet, carrier, slot, and circuit.

2. Enter x to see the trunk status.

      Field 2 shows the trunk number.

      Fields 8-12 show the equipment location.

      Field 13 shows the maintenance busy status of the first trunk (see Table 5-37).

      Field 14 shows which trunk you are viewing.

3. If you want to release the trunk from busy, go to *To Release a Trunk From Busy.*

4. If you want to busy out the trunk, go to *To Busy Out a Trunk Group.*

To Busy Out a Trunk

1. Make sure that you have selected a trunk group to busy out.

    If the trunk you want is not on your screen, enter nc until it appears.
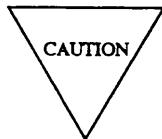
    CAUTION   Entering bo will drop calls on the trunk group.

    If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

      Field 13 contains a 1 when the ISDN trunk is busied out at the near end.

2. Enter bo to busy out the trunk.

    Field 10 contains a 1 when the trunk is busied out at the near end.

    If you enter an equipment location of a trunk that has a high internal trunk number, the first trunk of the trunk group appears when you enter x

3. If you want to release the trunk, go to *To Release a Trunk from Busy.*

To Release a Trunk from Busy

1. Make sure that you have selected a trunk group to release from maintenance busy.

   If you want to release an ISDN trunk the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. Enter `rb` to release the trunk from busy.

3. If you want to find the status of a trunk group, go to test 1.

Special Error Codes

While you are using Procedure 631 you may see the following special error codes:

- `80=There are more than 255 trunks in the trunk group.`

   Appears if the trunk group you selected contains more than 255 trunks. Check translation. If there are more than 255 trunks in the group, use Procedure631 Test 2 to busy out or release busy out the rest of the trunks.

- `81=The message transmission to the module processor failed.`

   You entered a command and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

TABLE 5-37

Field 13 Maintenance Status
0   = Not busy
1   = Demand busy
2   = Automatically busied

Procedure Fields

The fields listed below are data entry fields.

- In test 1 you can enter a trunk group number in field 2.

- In test 2 you can enter a trunk in fields 8-12.

The meaning of the fields are:

2.	Trunk Group Number	Initially shows the smallest trunk group number in the switch. Then shows which trunk group you are viewing. To find the services the trunk group offers, go to Procedure 100.
		Services can be assigned to trunk groups 18-999. Trunk groups 0-17 are reserved for special trunk-group functions.
6.	Number of Trunks In Trunk Group	Shows the number of trunks in the trunk group.
7.	Number of Busied-Out Trunks	Shows the number of trunks in the trunk group that are maintenance busied out.
8-12.	EQUIPMENT LOCATION	Shows the equipment location of the trunk group or trunk.
13.	Maintenance Status	Shows the maintenance busy status of the trunk. Table 5-37 shows the maintenance busy status encodes.
14.	Trunk Group	Shows which trunk in the trunk group you are viewing. Trunk groups can contain up to 255 trunks.

PROCEDURE 635 - CAUSE OF MAINTENANCE BUSY OUT

Purpose

Use Procedure 635 to find why BUSY OUT appears on your screen, to busy out or release a range, a port, or a port assigned to an extension, or to find the status of a port or extension.

Tests

Procedure 635 has three tests.

- Use test 1 to search for maintenance busied-out ports and to busy out or release ports.
- Use test 2 to search for nonnetwork uses of the busy-out indicator.
- Use test 3 to find the status (idle, in use, or busy) of an extension and busy out or release the port assigned to an extension.

Procedure Overview

When BUSY OUT appears on your screen there is reduced capacity in the switch. An administered port or a nonnetwork resource is no longer available for call processing. Use Procedure 635 to find the busied out port or nonnetwork resource and bring them back into service.

The switch may automatically busy out a port if an internal periodic, demand, or audit test fails. The switch may busy out a port when you do a maintenance demand test. You can busy out a port while using some administration or maintenance procedures. The switch can busy out a port during call processing or at the request from a far end switch (for ISDN primary rate interface (PRI)).

You can use Procedure 635 to search for busied-out ports by equipment location or by extension, to find the port status and why the port was busied out. It is a good practice to check with the system administrator and check the written switch history log before you release a circuit from busy. The circuit may have been busied out for a valid reason.

You may have to busy out a port or a range of ports until you can correct a problem in the switch. You can busy out the port by equipment location with test 1 or by extension with test 3.

To do these tasks you may have to use more than one test in Procedure 635. Procedure 635 may also direct you, from test 2 for example, to another maintenance procedure.

Use the following flowchart to guide you from test to test to help you select which test to use. You can remove the flowchart and refer to it as you use this procedure.

```
                              ┌─────────┐
                              │  START  │
                              └─────────┘
                                   │
                                   ▼
                          ┌──────────────────┐
                          │      START       │
                          │  PROCEDURE 635   │
                          │ TEST 1 OR TEST 3 │
                          └──────────────────┘
                                   │
                                   ▼
```

DO YOU KNOW WHICH PORT TYPE IS BUSIED OUT?

YES → ENTER A PORT EQUIPMENT LOCATION OR OR EXTENSION NUMBER

NO → SELECT A RANGE TO SEARCH THROUGH

RELEASE THE PORT FROM BUSY IF APPROPRIATE

SEARCH FOR BUSIED-OUT PORTS

IS THIS THE LAST PORT THAT IS BUSIED OUT?

NO

YES

IS BUSY OUT STILL ON YOUR SCREEN?

YES → START TEST 2 TO SEARCH FOR NON-NETWORK USES OF THE BUSY OUT INDICATOR

GO TO THE PROCEDURE REFERENCED IN FIELD 13

NO

RELEASE THE NONNETWORK PORT FROM BUSY IF APPROPRIATE

END

Figure 5-12. To Find Why BUSY OUT Appears on Your Screen

Test 1 - Operation

Use test 1 to search for maintenance busied-out ports and to maintenance busy out ports or release ports from maintenance busy.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   • If you are already in the procedure, but not in test 1, enter t1

   • Otherwise, enter p635

   The test 1 screen, similar to the following, appears.

```
                  ENHANCED MODE - PROCEDURE: 635, TEST: 1
                    FIND THE CAUSE OF MAINTENANCE BUSY OUT

 2. Port Type: ▢

EQUIPMENT LOCATION
   3.  Module: ▢
   4. Cabinet: ▢
   5. Carrier: ▢
   6.   Slot : ▢
   7. Circuit: ▢


  8.     Location Status: ▢
  9.      Circuit Status: ▢
 10.           Extension: ▢
 11. Maintenance Busy Status: ▢
 12.     Trunk Group Number: ▢
 13.     Procedure Reference: ▢




Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▭
│          ││       ││ F3 DATA ││       ││ F5 HELP ││ F6 FIELD ││ F7 INPUT ││ F8 CMDS │
```

The switch highlights field 2.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Port or a Range of Ports

1. If you want to select a range of ports by port type, choose from the following:
   - Enter `cf2` and enter the port type in field 2.
   - Enter `nu` until the port type you want to test appears.

     If you want to select by port type and by equipment location, first select the port type and then select the equipment location.

2. If you want to select all ports in the switch, enter `cf2` ; ; to blank fields 2 and 3.

   To select all ports, fields 2-7 must be blank

3. If you want to select all ports in a module, enter `cf3` and then enter the module number.

4. If you want to select all ports in a cabinet, enter `cf2` and then enter the module and cabinet number.

5. If you want to select all ports in a carrier, enter `cf3` and then enter the module cabinet, and carrier.

6. If you want to select all ports in a slot, enter `cf3` and then enter the module, cabinet, carrier, and slot.

7. If you want to select a specific port, choose from the following:
   - Enter `nc` until the port you want to test appears.
   - Enter cf3 and enter the module, cabinet, carrier, slot, and circuit.

8. If you want to search for the first busied-out port in the range, go to *To Search for a Busied-Out Ports.*

9. If you want to busy out the range, go to *To Maintenance Busy Out a Range or Port.*

To Search for Busied-Out Ports

You can busy out or release a port before or after you find its status.

1. Make sure that you have selected a range of ports.

2. Enter x to see the first busied out port in the range you selected.

   The switch searches for the first busied-out port in the range.

3. Enter nf to see each busied out port.

   > Fields 2-7 show the port type and equipment location (see Table 5-38).

   > Field 8 shows the location status (see Table 5-39).

   > Field 9 shows the circuit status (see Table 5-40).

   > Field 11 shows why the port is busied out (see Table 5-41).

   > Field 12 shows the trunk group number.

   > Field 13 shows which maintenance procedure to use for more diagnostics.

4. Go to the procedure shown in field 13 to find why the port is busied out.

   A six before the number in field 13 gives the whole procedure reference number.

5. If this is not the last busied out port, repeat steps 3-5.

   After you view all busied-out ports, the switch dashes fields 2-13. If you enter nf again, the original range appears.

6. If you want to search through a different range, go to *To Select a Port or a Range of Ports.*

7. If you want to release the port or a range, go to *To Release a Port or a Range of Ports from Maintenance Busy.*

8. If no ports are busied out and the busy-out indicator is still on your screen, go to test 2 to search for nonnetwork uses of the busy-out indicator.

9. If you want to search by extension, go to test 3.

To Release a Port or a Range of Ports from Maintenance Busy

1. Make sure that you have selected a port or a range.

    If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. Enter `rb` to release the port or a range.

    > Fields 2-7 show the range you selected.

    > Field 11 contains a 0 if you released a single port (see Table 5-41).

    `BUSY OUT` disappears from your screen if there is no other reason for it to be there.

    If the switch cannot release the port, special error code 81 appears. Fields 2-7 show the equipment location of the port that cannot be released from busy. Enter `rb` again to release the port from busy.

3. If you released all ports from busy but BUSY OUT is still on your screen, go to test 2 to search for nonnetwork uses of the busy out indicator.

4. If you want to release a different port or a range, go to *To Select a Port or Range of Ports.*

5. If you want to search by extension, go to test 3.

To Maintenance Busy Out a Port or a Range of Ports
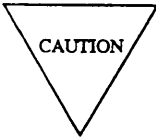
CAUTION — If you busy out a port while IN-USE is on your screen, any connections to the port are dropped. If you busy out a range of ports that are in use all connections in the range are dropped.

1. Make sure that you have selected a port or a range.

    If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

2. Enter bo to busy out a port or to start to busy out a range.

    If you busied out a single port field 11 contains a 635.

    If you try to busy out a port that is already busied out error code 21 appears. Select another port.

    If you selected a range of ports, special error code 80 appears m the message field.

3. To busy out a range, enter bo again.

    If a port fails to busy out while the switch is busying out a range of ports, the test stops and special error code 81 appears in the message field

    > Fields 2-7 show you the port type and equipment location of the port that failed to busy out.

    To continue, enter bo

    If you want to stop the switch from busying out all the range, enter s

    > Fields 2-7 show the last port that was busied out.

    To continue, enter bo

4. If you want to select a different port or a range of ports, go to *To Select a Port or a Range of Ports.*

5. If you want to search for nonnetwork port uses of the busy-out indicator, go to test 2.

6. If you want to search by extension, go to test 3.

Test 2 - Operation

Use test 2 to search for nonnetwork port uses of the busy-out indicator.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following.

   ●To start the procedure, enter `p635`

   ●If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 635, TEST: 2
              FIND NONNETWORK CAUSES OF MAINTENANCE BUSY OUT

 2. Port Type: ▢


EQUIPMENT LOCATION
   3. Module: ▢

13. Procedure Reference: ▢












Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS ]
```

   The switch highlights field 2.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Search for Other Uses of the Busy-Out Indicator

1. Enter x to search for nonnetwork uses of BUSY OUT.

    A nonnetwork port is a port that does not reside in a port carrier. Some nonnetwork port uses of the busy-out indicator include:

    *   Procedure 621 Test 2 which places a soft lock on one time multiplexed switch (TMS) or module control carrier (MCC).

    *   Procedure 650 Test 2 which removes the DCIU from service.

    If the switch finds a nonnetwork use of the busy-out indicator, the following appears.

    > Field 2 shows the port type (see Table 5-38).

    > Field 3 shows the module number.

    > Field 13 shows the maintenance procedure to use for more diagnostics.

    If the switch does not find any nonnetwork uses of the busy-out indicator, fields 2-13 contain a dash and error code 22 appears on the message line.

2. To search for other nonnetwork uses of the busy-out indicator, enter nf

    > Field 2 shows the port type (see Table 5-38).

    > Field 3 shows the module number.

    > Field 13 shows the maintenance procedure to use for more diagnostics.

3. Go to the procedure referenced in field 13.

    A six before the number in field 13 gives the whole procedure number.

4. If you do not find any nonnetwork port uses of the busy-out indicator, go to test 1 and search for busied out ports.

5. If you want to search for busied out ports by extension, go to test 3.

Test 3 - Operation

Use test 3 to find the status of an extension and to busy out or release the port assigned to an extension.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   ● To start the procedure, enter p635

   ● If you are already in the procedure, but not in test 3, enter t3

   The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 635, TEST: 3
            FIND THE CAUSE OF MAINTENANCE BUSY OUT BY EXTENSION

  2. Port Type: ❑


EQUIPMENT LOCATION
   3.   Module: ❑
   4. Cabinet: ❑
   5. Carrier: ❑
   6.    Slot: ❑
   7. Circuit: ❑


  8.     Location Status:  ❑
  9.        Circuit Status: ❑
 10.          Extension:  ❑
 11. Maintenance Busy Status: ❑
 12.     Trunk Group Number: ❑
 13.     Procedure Reference: ❑



Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▬
 _____   _____   |F3 DATA |   _____   |F5 HELP ||F6 FIELD||F7 INPUT||F8 CMDS|
```

The switch highlights field 10.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select an Extension

1. To select an extension, choose from the following:

   ● If an extension is already on your semen, enter `cf10` and then enter the extension in field 10.

   ● If you do not know the extension, enter `nc` until the extension you want to test appears.

   Fields 2-7 show the port type and equipment location (see Table 5-38).

   Field 8 shows the location status (see Table 5-39).

   Field 9 shows the circuit status (see Table 5-40).

   Field 11 shows why the port is busied out (see Table 5-41).

   Field 13 shows which maintenance procedure to use for more diagnostics.

   After you view all assigned extensions, the switch dashes field 10. If you enter `nc` again, field 10 shows the first assigned extension.

2. If you want to release the extension from busy, go to *To Release an Extension from Maintenance Busy.*

3. If you want to busy out the extension, go to *To Maintenance Busy Out an Extension.*

To Search for a Busied-Out Extension

1. Enter x to search for the first busied-out extension.

    When the switch finds a busied-out extension, the following appears.

    >   Fields 2-7 show the port type and equipment location (see Table 5-38).

    >   Field 8 shows the location status (see Table 5-39).

    >   Field 9 shows the circuit status (see Table 5-40).

    >   Field 10 shows the extension.

    >   Field 11 shows why the port is busied-out (see Table 5-41).

    >   Field 12 shows the trunk group number.

    >   Field 13 shows which maintenance procedure to use for more diagnostics.

    If the switch does not find a busied-out extension, fields 2-13 are empty.

2. To see the next busied-out extension, enter nf

    >   Fields 2-7 show the equipment location of the next busied-out extension (see Table 5-38).

    >   Field 10 shows the extension.

3. If this is not the last busied out extension, repeat steps 2 and 3.

    After you view all busied-out extensions, the switch dashes fields fields 2-13. If you enter nf again, the first assigned port equipment location appears.

4. If you want to release the extension, go to *To Release an Extension from Maintenance Busy.*

5. If you want to search by equipment location, go to test 1.

6. If you want to find nonnetwork uses of the busy-out indicator, go to test 2.

To Release an Extension from Maintenance Busy

1.   Make sure that you have selected an extension.

2. Enter rb to release the extension from busy.

    Field 11 contains a 0 when you release an extension (see Table 5-41).

    When you release an extension, the switch does not release all button appearances of the extension.

3. Enter `nf` to find the next busied-out extension.

4. If you want to select a different extension, go to *To Select an Extension.*

5. If you want to search by equipment location, go to test 1.

6. If you want to find nonnetwork uses of the busy-out indicator, go to test 2.

To Maintenance Busy Out an Extension

1. Make sure that you have selected an extension before you busy out the extension.

2. Enter `bo` to busy out the extension in field 10.

   Field 11 contains a 635 when the extension is busied-out (see Table 5-41).

   When you busy out an extension, the switch does not busy out all button appearances of the extension.

   If you try to busy out an extension that is already busied-out error code 21 appears. Select another extension.

3. To find the next busied-out extension, enter `nf`

4. If you want to select another extension, go to *To Select an Extension.*

5. If you want to search by equipment location, go to test 1.

6. If you want to find nonnetwork uses of the busy-out indicator, go to test 2.

Special Error Codes

While using Procedure 635, the following special error codes may appear on your screen:

- `80=Enter` **bo** `twice to busy out a range of ports.`

   You tried to busy out a range of ports. If you want to busy out the whole range, enter `bo` a second time.

- `81=The message transmission to the module processor failed.`

   You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

TABLE 5-38

Field 2 Port Type		
1	=	Call progress tone plant
16	=	On-premises terminal
17	=	Attendant interface
18	=	Off-premises terminal
19	=	Transmission test
20	=	Auxiliary tone plant
32	=	CO trunk
33	=	DID trunk
34	=	TIE trunk
35	=	Auxiliary trunk
36	=	Touch-tone receiver
37	=	Touch-tone sender
38	=	Attendant conference
39	=	ANI data transmitter
40	=	Data port trunk
41	=	Contact interface
42	=	Tone detector 2
43	=	GPP data module trunk
44	=	EIA trunk
45	=	Primary rate interface trunk
48	=	Multifunction digital terminal
49	=	Multifunction electronic terminal
50	=	Multifunction analog terminal
51	=	GPP data module terminal
52	=	EIA terminal
53	=	Analog or digital facility test circuit
54	=	ISDN BRI terminal
55	=	Single line set without line

TABLE 5-39

Field 8 Location Status		
0	=	Local
1	=	Remote
2	=	Even port, local
3	=	Odd port, local
4	=	Even port, remote
5	=	Odd port, remote

TABLE 5-40

Field 9 Circuit Status		
0	=	Idle
1	=	In use
2	=	Trunk in limbo
3	=	Permanent in-seizure
4	=	ISDN near end maintenance busy
5	=	ISDN far-end maintenance busy

Procedure Fields

The following are data entry fields.

- In test 1, you can enter the unit enter in field 2.

- In test 1, you can enter an equipment location in fields 3-7.

- In test 3, you can enter an extension infield 10.

The meaning of the fields are:

2.	Port type	This field explains the translation of a port. Port types can be grouped into tone sources, stations, lines, trunks, and ports that do not reside in a network port carrier. Table 5-38 lists the port-type encodes.
3-7	EQUIPMENT LOCATION	Shows the equipment location of the circuit or a range you want to examine or busy out.
8.	Location Status	Shows the physical location and the translation (even or odd) of a channel.

Remote circuits in a remote carrier group can be physically located up to 100 miles from the carrier you are testing. This field may show that a circuit is located in a remote carrier group. A remote carrier group is not a remote module.

A general purpose port (GPP) supports equipment that can have two channels, an even channel and an odd channel. This field shows which channel you are testing. Table 5-38 lists the location-status encodes.

TABLE 5-41

Field 11 Maintenance Busy Status		
0 = Not busy	21 = Modem pool maintenance scheduler task	211 = GPP port maintenance demand task
1 = Periodic test for dial tone	22 = Operation error processing periodic task	213 = MLP port maintenance demand task
2 = Automatic transmission measurement system periodic task	23 = Status memory audits	213 = MLP port maintenance demand task
3 = Attendant conference maintenance time available task	24 = TIE trunk maintenance periodic task	214 = Modem pooling facility maintenance demand task
4 = Touch-tone periodic task	25 = Tone detector maintenance time available task	215 = Terminal maintenance demand task
5 = Auxiliary tone plant maintenance periodic task	26 = Call progress tone maintenance periodic task	216 = TIE trunk maintenance demand task
6 = Auxiliary trunk maintenance periodic task	27 = Touch-tone waler receiver periodic task	217 = Tone detector maintenance demand task
7 = Circuit select (port maintenance test controller) periodic task	28 = Trunk error call processing task	218 = Call progress tone plant maintenance demand task
8 = CO trunk maintenance periodic task	29 = ISDN (busy from far-end) periodic task	219 = Touch-tone sender receiver maintenance demand task
9 = Modem pool call processing periodic task	33 = Board either inserted or removed	220 = Trunk verification by station maintenance demand task
10 = Data linkage audit task	34 = D-channel signaling lost at near or far end	221 = Dedicated switch connection maintenance demand task
11 = Data port maintenance time available task	35 = DS1 layer 2 not operational	620 = Procedure 620 demand task
12 = DID trunk maintenance periodic task	200 = Automatic measurement system	622 = Procedure 622 demand task
13 = Digital service (DS-1) maintenance periodic task	201 = Attendant conference maintenance demand task	623 = Procedure 623 demand task
14 = EIA port maintenance time available task	202 = Auxiliary tone plant maintenance demand task	631 = Procedure 631 demand task
15 = Hyperactive terminal maintenance periodic test	204 = Circuit select (port maintenance) demand task	640 = Procedure 640 demand task
16 = Facility test circuit maintenance periodic task	206 = Data port maintenance demand task	646 = Procedure 646 demand task
17 = GPP maintenance time available task	207 = DID trunk maintenance demand task	647 = Procedure 647 demand task
18 = Line circuit maintenance time available task	208 = Digital service (IX-l) maintenance demand task	648 = Procedure 648 demand task
19 = MLP maintenance time available task	209 = EIA port maintenance demand task	
20 = Modem pool facility maintenance periodic task	210 = Facility test circuit maintenance demand task	

9.	Circuit Status	Shows the ports availability for call processing. Table 5-40 lists the circuit status encodes.
10.	Extension	Shows the extension assigned to the equipment location on your screen. The switch can show extensions that are busied out or you can enter an extension to find its status.
		If the home-port bit is not set, the switch shows the first translated port for the extension. The home-port bit is set in Procedure 052.
11.	Maintenance Busy Status	Shows whether the port is maintenance busy and what caused the maintenance busy. Encodes 1-29 define scheduled, periodic, audit, or time-available tests that can busy out a port. These tests are run automatically by the switch. If an automatic test fails three times the switch busies out the port. Encodes 200-221 describe demand tests that have busied out the port. Encodes 600-660 describe maintenance procedures that have busied out the port. Table 5-41 lists the maintenance busy status encodes.
12.	Trunk Group Number	This field shows the trunk group number. To find the services that a trunk group provides, go to Procedure 100.
		Services can be assigned to trunk groups 18-999. Trunk groups 0-17 are reserved for special trunk-group functions.
13.	Procedure Reference	This field points you to the next procedure you should enter to find the cause of busy out.
		The last two digits of the procedure appear in field 13. A 6 before the numbers in field 13 gives the full procedure number.

PROCEDURE 640 - TRUNK TESTS

Purpose

Use Procedure 640 to examine the trunk failure history log, to resolve alarms, to busy out or release trunks, and to monitor trunk activity.

Tests

Procedure 640 has two tests.

- Use test 1 to examine the trunk failure history log, to resolve alarms, or to busy out or release trunks.

- Use test 2 to monitor trunk activity or to busy out or release trunks from busy.

Procedure Overview

The switch logs trunk failures it finds during call processing. If the switch finds a serious trunk failure, it lights **OTHER FAILS** on the common-control alarm panel. In a universal module, the trunk port detects and reports more failure information than reported in a traditional trunk.

To use trunk data codes in Procedure 640 you must be experienced in call processing. It is also helpful to have a calculator to convert octal numbers to hexadecimal, binary, and decimal.

There are 4 data types you can view. Each data type shows different information about a trunk Data types 1 and 2 show information about past failures. Data type 1 shows translation information that you can use to find the trunk type, and dialing information that you can use to test the trunk (see Table 5-42 and Figure 5-13). Data type 2 shows the trunk status and shows information about the trunk connection when the trunk failed (see Table 5-43 and Figure 5-13). Data type 3 shows the trunk status as it changes, while you use Procedure 640 to monitor the trunk activity (see Table 5-44 and Figure 5-14). Data type 4 lets you view frozen type 3 data after you stop monitoring.

Use test 1, with type 1 data, to find the trunk type. You can use the trunk dial access code, the trunk number, and the trunk verification access code to dial the trunk for further diagnoses. In test 1 you can examine up to 60 trunk circuits in the PMIDS trunk failure buffer. You can only examine a block of six data entries at a time. Use test 1, with type 2 data, to find the status of the trunk when it failed.

Use test 2, with type 3 data, to monitor a calls progress on a trunk. You can select a specific event to monitor. Every time the trunk changes state all trunk parameters are recorded. Examine the frozen data with data type 4.

Test 1 - Operation

Use test 1 to examine the trunk failure history log, to resolve alarms or to busy out or release trunks.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   • If you are already in the procedure but not in test 1, enter `t1`

   • Otherwise, enter `p640`

   The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 640, TEST: 1
                EXAMINE THE TRUNK FAILURE HISTORY LOG


EQUIPMENT LOCATION
    2.   Module:  ▢
    3. Cabinet:   ▢
    4. Carrier:   ▢
    5.    Slot :  ▢
    6. Circuit:   ▢
   7. Maintenance Busy Status:  ▢
   8.          Alarm Status:  ▢
FAILURES
    9.        Failure Code:  ▢
   10. Number of Failures:  ▢
   11.     Failure Index:  ▢
TRUNK DATA
   12.      Data Type:  ▢
   13.          Index:  ▢
   14.           Code:  ▢


Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT

enter command: ▭
│         ││      ││F3 DATA ││      ││F5 HELP ││F6 FIELD ││F7 INPUT ││F8 CMDS │
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Trunk Failure History Log

1. Enter x to freeze and sort the first six failures in the trunk failure history log.

   The switch puts the data for the first six trunk failures in the trunk failure buffer.

   Field 10 shows the number of trunk failures. If there are no failures, field 10 contains a 0.

   If there are any trunk failures in the trunk failure history log, the following appears.

   Fields 2-6 show the trunk circuit equipment location.

   Field 7 shows the maintenance busy status (see Table 5-45).

   Field 8 shows the alarm status (see Table 5-46).

   Field 9 shows the lowest failure code (see Table 5-47).

   Field 10 shows the number of trunk failures (up to 60).

   Field 11 shows which of the six failures in the buffer you are viewing. The number in field 11 increases by one as you view each failure.

   Field 12 shows the trunk data type (see Table 5-42). In test 1 you can view data types 1 and 2.

   Field 13 shows the trunk data index. Data type 1 has five indexes. Data type 2 has ten indexes.

   Field 14 shows the trunk data code. Data codes for data type 1 are in decimal (see Table 5-42). Data codes for data type 2 are in octal (see Table 5-43).

2. Enter nu to see each failure code.

   Field 9 shows the failure code (see Table 5-47).

3. If this is not the last failure code, repeat steps 2 and 3.

   After you view all failure codes, the switch dashes field 9. If you enter nu again, the lowest failure code appears.

4. Enter nd to see each trunk data index.

   Field 12 shows the next data type (see Table 5-42 for type 1 or 5-43 for type 2).

   Field 13 shows the index in the failure buffer (see Table 5-42 for type 1 or 5-43 for type 2).

   Field 14 shows the code. Data codes for data type 1 are in decimal (see Table 5-42). Data codes for data type 2 are in octal (see Table 5-43). While viewing type 2 data, convert the number in field 14 to binary so you can examine each bit position. Then use Table 5-43 or Figure 5-13 to interpret the code.

   The code changes as you view each index. After you view all five type 1 indexes, the switch steps through the ten type 2 indexes.

5. If you want to switch from type 1 to type 2 indexes, without stepping through all indexes, enter s

    Field 12 shows the data type.

    Field 13 shows the index in the failure buffer.

    Field 14 shows the code.

6. To step through all indexes for the trunk on your screen, repeat steps 4-6.

7. Enter nc to see each failure in the trunk failure history log.

    Fields 2-6 show the trunk circuit equipment location.

    Field 7 shows the maintenance busy status (see Table 5-45).

    Field 8 shows the alarm status (see Table 5-46).

    Field 9 shows the lowest failure code (see Table 5-47).

    Field 10 shows the number of trunk failures (up to 60).

    Field 11 shows which of the six failures in the buffer you are viewing. The number in field 11 increases by one as you view each failure in the current block of six failures.

    Field 12 shows the trunk data type. In test 1 you can view data types 1 and 2.

    Field 13 shows the trunk data index. Data type 1 has five indexes. Data type 2 has ten indexes.

    Field 14 shows the trunk data code. Data codes for data type 1 are in decimal (see Table 5-42). Data codes for data type 2 are in octal (see Table 5-43).

8. If this is not the last failure, repeat steps 2-8.

    After you view all trunk failures in the first group of six, the switch dashes fields 2-14. If you enter nc again, the first failure in the current block of six failures appears.

9. To see the next block of six failures, enter nf

    When you get a new block of six failures the switch updates the total number of failures. New trunk failures appear in the total.

10. If there are more failures in the trunk failure history log, repeat steps 2-10.

    After you view all failures, the switch dashes fields 2-14. If you enter nf again, the first block of six failures appears.

11. If you want to resolve alarms, go to *To Resolve Alarms.*

12. If you want to busy out a trunk, go to *To Busy Out a Trunk.*

13. If you want to release a trunk from busy, go to *To Release a Trunk from Busy.*

14. If you want to monitor trunk activity, go to test 2.

To Resolve Alarms

You may want to resolve any invalid alarms from the trunk failure history log.

1. Make sure that the trunk failure is on your screen.

    If the trunk failure is not on your screen, enter `x` and then enter `nc`
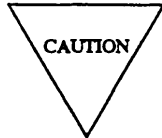
    Record all alarms before you resolve them from the trunk failure history log. Then you will have a trunk failure record you can use for future troubleshooting.

2. Enter `cdx` to resolve alarms.

    Field 10 shows the number of trunk alarms and errors still in the trunk failure history log.

    If the circuit is not alarmed, error code 00 appears. Use Procedure 600 Test 2 to remove trunks with errors.

    The switch marks trunk alarms resolved. Resolved alarms do not appear after you enter `nc` or `nf` The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

3. If you want to busy out a trunk, go to *To Busy Out a Trunk.*

4. If you want to release a trunk from busy, go to *To Release a Trunk from Busy.*

5. If you want to monitor trunk activity, go to test 2.

To Busy Out a Trunk

1. Make sure that the trunk equipment location is on your screen.

    If the equipment location is not on your screen, enter `x` and then enter `nc` until the trunk circuit you want to busy out appears.

    If you busy out a trunk that is in use, you will drop all service in the trunk. A trunk in limbo appears to be in use but does not provide any service.

    If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

2. Enter `bo` to busy out a trunk.

    Field 7 shows the maintenance busy status (see Table 5-45).

3. If you want to release trunks from busy, go to *To Release a Trunk from Busy.*

4. If you want to monitor trunk activity, go to test 2.

To Release a Trunk from Busy

If you busied out any trunks to repair a trunk problem, test the trunk and then release the trunk from busy (if appropriate) before you leave Procedure 640.

1. Make sure that the equipment location is on your screen.

   If the equipment location is not on your screen, enter x and then enter nc until the equipment location appears on your screen.

   If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. Enter rb to release the trunk from busy.

   Field 7 contains a 0 when the trunk is released from busy (see Table 5-45).

   BUSY OUT disappears from your screen if there are no other reasons for it to be on.

3. If you want to busy out a trunk, go to *To Busy Out a Trunk.*

4. If you want to test the trunk and record data from the trunk, go to test 2.

TABLE 5-42

Data Type 1 (Field 12) Showing Translation Data Codes (Field 14) for Each Index (Field 13)		
Index	Code	Description
0	18-99	Trunk group number
1	0-999999	Trunk dial access code†
2	0-99999	Trunk member index - circuit access information for SMDR‡
3		Trunk Signaling Type
	0	No signaling required
	1	Ground start
	2	Ground start with parity test
	3	Loop or reverse battery, wink start
	4	E&M immediate start in and out
	5	E&M wink start in or immediate start out
	6	ANI signaling
	7	Auxiliary equipment
	8	E&M delay dial in or immediate start out
	9	E&M delay dial in or wink start and delay dial with dial tone out
	10	E&M wink start in or wink start and delay dial with dial tone out
	11	E&M wink start in or delay dial out (universal sequence)
	12	E&M immediate start in or wink start and delay dial out
	13	E&M release link trunk out
	14	E&M release link trunk in
	15	E&M main or satellite, immediate start
	16	E&M main or satellite, wink start
	17	E&M main or satellite delay dial
	18	S-channel signaling, host access-general purpose port
	19	Loop start
	20	DMI ISDN MOS
	21	E&M wink start both ways
	22	E&M delay dial both ways
	23	E&M delay dial in or wink start and delay dial out
	24	E&M delay dial in or wink start and delay dial out with fail on timeout
	25	E&M immediate start in or wink start and delay dial out with fail on timeout

†-An ll represents a * and A 12 represents a #. The first dialed digit is separated from the rest by a dash.

‡-Use trunk ID codes with trunk verification by attendant, trunk verification by terminal, night service, SMDR and automatic circuit assurance features.

TABLE 5-42 *Continued*

Data Type 1 (Field 12) Showing Translation Data Codes (Field 14) for Each Index (Field 13)		
Index	Code	Description
3	26	E&M wink start in or wink start and delay dial out with fail on timeout
	27	Analog line loop signaling
	28	E&M automatic in or immediate start out
	29	E&M automatic in or wink start out
	30	Loop or reverse battery, immediate start
	31	E&M immediate start in or automatic out
	32	E&M automatic both ways
4		Trunk Identifier
	o	Traditional trunk
	1	Hybrid trunk
	2	DS1 trunk
	3	DS1 hybrid trunk

TABLE 5-43

Data Type 2 (Field 12) Showing Trunk Data Codes (Field 14) for Each Index (Field 13)		
Index	**Bit**	**Description**
0	14	0 = audio path 1 = talk path
	15	0 = activity on the trunk 1 = no activity on the trunk
1	0-10	Call progress mark (for a complete list refer to the on-line help)
2	0-7	Sequence step that increases by 1 when the state changes
	8-14	Sequence order (The type of sequence executed for this order)
	15	0 = Call processing is in control 1 = Call processing stimulus goes to the sequence package instead of to call processing
3	0-6	Timing count decreases by 1 at the rate in bits 7 and 8 to time a call processing event
	7-8	00 = no timing 10 = 25ms 0 = 100ms 11 = 2 seconds
	9	0 = no failure of internal time available audit 1 = internal time available audit has failed once
	10	0 = Not an AAR call 1 = AAR call
	11	0 = trunk is not connected to a timeslot 1 = trunk is connected to a timeslot
	12	1 = one way talk path (link) 0 = no one way link
	13	0 = incoming call 1 = outgoing call
	14	0 = the trunk is available for call processing 1 = the trunk is busied out

TABLE 5-43 *Continued*

Data Type 2 (Field 12) Showing Trunk Data Codes (Field 14) for Each Index (Field 13)		
Index	**Bit**	**Description**
	15	0 = do not restrict the call 1 = restrict the call if battery reversal occurs, priority call
4	0-14	Internal facility number for the trunk (For call processing this number is usually the controlling line number For switch loops this number is the internal record number of the called party For originating registers this number is the facility (line or trunk) that is dialing)
	15	0 = the facility number is for a trunk 1 = the facility number is for a line
5	0-14	Internal facility number of the trunk (For switch loops the number of the calling party For originating registers, the facility over which digits may be sent)
	15	0 = the facility number is for a trunk 1 = the facility number is for a line
6	0-14	Third internal line or trunk facility number of the trunk (For call processing, the facility on soft hold For switch loops, this bit is a reserved digit register or the intercom record) 1 = the facility number is for a line 0 = the facility number is for a trunk
7	0-5	Demand scan of traditional hardware trunk or switch status of a universal trunk 0 = Both ends idle 1 = Far end busy 2 = Near end busy 3 = Near and far end busy
	6-11	The last look call processing had of the scan data status
	12-15	Trunk mask 0 = No mask 3 = Ignore all scan changes on the port

TABLE 5-43 *Continued*

Index	Bit	Description
8	0-7	The stimulus from call processing when a trunk signaling sequence or a call processing routine failed
	8-11	Scan data for the stimulus
	12-15	The state program writing the stimulus and scan data (the most common trunk failing state program is timeout) 0 = No valid data 1 = Valid data
9	0-4	The FIFO Code obtained by the 501CC from the universal module processor
	6	0 = Data in bits 0-4 is not valid 1 = Data in bits 0-4 is valid

Test 2 - Operation

Use test 2 to monitor trunk activity or to busy out or release trunks from busy.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p640
   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
               ENHANCED MODE - PROCEDURE: 640, TEST: 2
                        MONITOR TRUNK ACTIVITY


EQUIPMENT LOCATION
   2.   Module:  ▯
   3.  Cabinet:  ▯
   4.  Carrier:  ▯
   5.    Slot:   ▯
   6.  Circuit:  ▯


 7. Maintenance Busy Status:  ▯


TRUNK DATA
  12.       Data Type:  ▯
  13.           Index:  ▯
  14.            Code:  ▯
  15. Prior Code Index: ▯




Connected to CC0 ON-LINE ♥ [ MAJOR ] [ MINOR ] [ RUN TAPE ] [ BUSY OUT ] [ IN USE ] [ WAIT ]

enter command: ▭
[_____] [_____] [F3 DATA ] [_____] [F5 HELP ] [F6 FIELD] [F7 INPUT] [F8 CMDS]
```

The switch highlights field 2.

Fields 2-6 may contain a default equipment location from test 1.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Monitor Trunk Activity

1. If you want to select a trunk, enter `cf2` and enter the equipment location in fields 2-6.

2. Enter `x` to monitor trunk activity.

    When the code on your screen changes, the switch samples and logs data for each data index. The switch logs up to ten code changes before it overwrites old data.

    Note that the switch samples and records trunk data every 30 ms. If the trunk changes state more than once in 30 ms the switch may not log it. Your screen, however, is not updated every 30 ms. The log may contain information that did not even appear on your screen. Heavy call traffic can lengthen the time between samples.

3. To select a different index, enter `nd`

    New data is logged every time the new trunk data code changes.

    > Fields 2-6 show the trunk circuit equipment location.

    > Field 7 shows the maintenance busy status (see Table 5-45).

    > Field 12 contains a 3 (see Table 5-44).

    > Field 13 shows the trunk data index and is initially equal to 0 (see Table 5-44).

    > Field 14 shows the trunk data code as it changes (see Table 5-44).

    > Field 15 shows the prior code index. The prior code data only appears after you enters

4. If you want to see the code changes since you started the test, enter `s` to stop logging data.

    > Field 12 changes to a 4. In type 4 mode you can examine the data codes the switch recorded.

5. Enter `nu` to see the next most recent change for the set of data codes when the monitored indexed code changed state.

    > Field 14 shows the next most recent code the switch recorded.

    > Field 15 shows which code you are viewing.

6. If this is not the last code repeat steps 5 and 6.

    After you view all codes, the switch dashes fields 14 and 15. If you enter `nu` again the first logged entry appears.

7. Enter nd to see the next index.

   Field 13 shows the trunk data index.

   Field 14 shows the code (see Table 5-44).

8. If you want to view data type 1, enter nf

   Field 12 shows the data type (see Table 5-44). You can change between data type 3, data type 4, or data type 1. You may want to get the trunk dial access code (data type l, index l) so you can call the trunk.

   Field 12 shows the data type 4 (see Table 5-44).

   Field 13 shows the new trunk data index.

   Field 14 shows the trunk data code.

9. If you want to find the time between two code changes, go to *To Find the Time Between Two Code Changes.*

10. If you want to busy out a trunk, go to *To Busy Out a Trunk.*

11. If you want to release the trunk from busy, go to *To Release a Trunk from Busy.*

12. If you want to examine the trunk failure history log or resolve alarms, go to test 1.

To Find the Time Between Two Code Changes

1. Enter nd until field 13 contains a 8.

2. Record the first code.

3. Enter nu to get the second code.

4. Convert both numbers to decimal.

5. Subtract the second code from the first code.

   If the second code is larger than the first code, subtract code 2 from 1023 and add the first code.

6. Multiply the difference by 10 to get the time between the two code changes (in ms).

7. If you want to examine the trunk failure history log, go to test 1.

To Busy Out a Trunk

1. Make sure that the trunk equipment location is on your screen.

    If the equipment location is not on your screen, enter x and then enter nc until the trunk circuit you want to busy out appears.

     CAUTION If you busy out a trunk that is in use, you will drop all service in the trunk. A trunk in limbo appears to be in use but does not provide any service.

    If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

2. Enter bo to busy out a trunk.

    Field 7 shows the maintenance busy status (see Table 5-45).

3. If you want to release trunks from busy, go to *To Release a Trunk from Busy.*

4. If you want to examine the trunk failure history log, go to test 1.

To Release a Trunk from Busy

If you busied out any trunks to repair a trunk problem, test the trunk and then release the trunk from busy (if appropriate) before you leave Procedure 640.

1. Make sure that the equipment location is on your screen.

    If the equipment location is not on your screen, enter x and then enter nc until the equipment location appears on your screen.

    If you want to release an ISDN trunk the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. Enter rb to release the trunk from busy.

    Field 7 shows a 0 when the trunk is released (see Table 5-45).

    BUSY OUT disappears from your screen if there are no other reasons for it to be on.

3. If you want to busy out a trunk, go to *To Busy Out a Trunk.*

4. If you want to examine the trunk failure history log, go to test 1.

TABLE 5-44

Data Type 3 and 4 (Field 12) Showing Trunk Data Codes (Field 14) for Each Index (Field 13)		
Index	**Bit**	**Description**
0	14	0 = audio path 1 = talk path
	15 0-13	0 = activity on the trunk 1 = no activity on the trunk Timeslot
1	0-10	Call progress mark (for a complete list refer to the on-line help)
2	0-7	Sequence step (increases by 1 when the state changes)
	8-14	Sequence order (type of sequence executed for this order)
	15	0 = Call processing is in control 1 = Call processing stimulus goes to the sequence package instead of to call processing
3	0-6	The timing count decreases by 1 at the rate in bits 7 and 8 to time a call processing event
	7-8	00 = no timing 10 = 25ms 0l = 100ms 11 = 2 seconds
	9	0 = no failure of internal time available audit 1 = internal time available audit has failed once
	10	0 = Not an AAR call 1 = AAR call
	11	0 = trunk is not connected to a timeslot 1 = trunk is connected to a timeslot
	12	1 = one way talk path (link) 0 = no one way link
	13	0 = incoming call 1 = outgoing call
	14	0 = the trunk is available for call processing 1 = the trunk is busied out

TABLE 5-44 *Continued*

Data Types 3 and 4 (Field 12) Showing Trunk Data Codes (Field 14) for Each Index (Field 13)		
Index	**Bit**	**Description**
	15	0 = do not restrict the call 1 = restrict the call if battery reversal occurs, priority call
4	0-14	Internal facility number for the trunk (For call processing this number is usually the controlling line number For switch loops this number is the internal record number of the called party) For originating registers, this number is the facility (line or trunk) that is dialing)
	15	0 = the facility number is for a trunk 1 = the facility number is for a line
5	0-14	Internal facility number of the trunk For switch loops the number of the calling party For originating registers, the facility over which digits maybe sent
	15	0 = the facility number is for a trunk 1 = the facility number is for a line
6	0-14	Third internal line or trunk facility number of the trunk For call processing, the facility on soft hold For switch loops, this bit is a reserved digit register or the intercom record 1 = the facility number is for a line 0 = the facility number is for a trunk
7	0-5	Demand scan of traditional hardware trunk number or the switch status of a universal trunk 0 = Both ends idle 1 = Far end busy 2 = Near end busy 3 = Near and far end busy
	6-11	The last look call processing had of the scan data status
	12-15	Trunk mask 0 = No mask 3 = Ignore all scan changes on the port
8	0-15	Counter of 10 ms interrupts

Special Error Codes

While using Procedure 640 you may see the following special error codes:

- 81=The message transmission to the module processor failed.

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

Procedure Fields

The fields listed below are data entry fields.

- In test 2 you can enter data in fields 2-6 to select an equipment location.

The meaning of the fields are:

2-6.	EQUIPMENT LOCATION	Shows the equipment location of the trunk you are testing.
7.	Maintenance Busy Status	Contains a 1 if the trunk is busied out or a 0 if the trunk is not busied out. Table 5-45 shows the maintenance busy status encodes.
8.	Alarm Status	Shows the alarm status of the trunk in test 1. Table 5-46 shows the alarm status encodes.
9.	Failure Code	Shows the type of failure in test 1. Table 5-47 shows the failure codes.
10.	Number of Failures	Shows the number of circuits with failures (up to 60).
11.	Failure Index	Shows which failure you are viewing.
12.	Data Type	The type of data you are viewing changes. Use Tables 5-42 through 5-44 to interpret the code.
13.	Index	Shows the trunk Table index. Tables 5-42 through 5-44 show the index.
14.	Code	In test 1, data type 1, codes are in decimal (see Table 5-42). In test 1, data type 2, codes are in octal (see Table 5-43 and Figure 5-13). In test 2, data type 3 and 4, codes are in octal (see Table 5-44 and Figure 5-14). You have to convert the octal numbers to binary so you can examine each bit and interpret the code.
15.	Prior Code Index	Shows the index of the last recorded data in test 2.

TABLE 5-45

Field 7 Maintenance Busy Status		
0	=	Not busy
1	=	Busy

TABLE 5-46

Field 8 Alarm Status		
0	=	No errors recorded
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors
5	=	Alarm resolved

TABLE 5-47

Field 9 Failure Code		
2	=	Call processing failure
8	=	ETN automatic maintenance busy out
9	=	Permanent in-seize
20	=	No external release on PBX disconnect
21	=	Belated external release
22	=	On-hook before wink
23	=	On-hook before ready to receive digits
24	=	Port fault
30	=	Single polarity ringing current
31	=	Ringing without ground
32	=	Ground, but no ringing
33	=	Ground detector stuck active
34	=	No loop current on incoming call
35	=	No tip ground detected outgoing
36	=	No loop current on outgoing call
40	=	Fault on signaling lead
41	=	On-hook during wink
42	=	Fault on tip or ring
43	=	Wink too short for valid signal
99	=	Invalid up-link message

		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
I N D E X	0	activity_	talk_path														
	1									PROGRESS_MARK1_P640_T2							
	2	seqctl_p6	SEQUENCE_ORDER_P640_T2							SEQUENCE_STEP_P640_T2							
	3	toll_bit_	tmbi_p640	outgo_bitl	waylink_	t_tsl_p64	aar_cal_p	adt_fail_	mapid_p640_t2		COUNT_P640_T2						
	4	u1_p640_	FACILITY1_P640_T2														
	5	u2_p640_	FACILITY2_P640_T2														
	6	u3_p640_	FACILITY3_P640_T2														
	7	TRUNK_MASK_P640_T2					TRUNK_LAST_LOOK_P640_T2					DEMAND_SCAN_P640_T2					
	8	FAIL_SOURCE_P640_T2					SCAN_DATA_P640_T2				STIMULUS_P640_T2						
	9									set to 0	vld_fifo_	set to 0	TRUNKFIFOCD_P640_T2				

BIT POSITION

Figure 5-13. Trunk Failure Data - Data Type 2

		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
I N D E X	0	activity_	talk_path						TIME_SLOT1_P640_T3								
	1									PROGRESS_MARK1_P640_T3							
	2	seqctl_p6	SEQUENCE_ORDER_P640_T3							SEQUENCE_STEP_P640_T3							
	3	toll_bit_	tmbi_p640	outgo_bitl	waylink_	t_tsl_p64	aar_cal_p	adt_fail_	mapid_p640_t2		COUNT_P640_T3						
	4	u1_p640_	FACILITY1_P640_T3														
	5	u2_p640_	FACILITY2_P640_T3														
	6	u3_p640_	FACILITY3_P640_T3														
	7	TRUNK_MASK_P640_T3					TRUNK_LAST_LOOK_P640_T3					DEMAND_SCAN_P640_T3					
	8	FLOPER_P640_T3 COUNTER OF 10-MILLISECOND INTERRUPTS															

BIT POSITION

Figure 5-14. Monitor Data - Data Types 3 and 4

PROCEDURE 642 - TERMINAL-TO-TRUNK TEST CALL

Purpose

Use Procedure 642 to make a terminal-to-trunk test call, by trunk dial access code (DAC), to a single trunk or to all trunks in a trunk group.

Tests

Procedure 642 has three tests.

- Use test 1 to test all trunks in a trunk group with a selected trunk dial access code.

- Use test 2 to test a single trunk.

- Use test 3 to test all trunks in a trunk group.

Procedure Overview

Use Procedure 642 to test trunks with a test line and terminal equipment. Use Procedure 642 when there are user reported troubles with trunk calls that are not found by Procedure 600 or Procedure 620. User reported trouble may be intermittent.

Use Procedure 642 to isolate the potential trouble to a particular trunk circuit. Then use Procedure 620 to diagnose the problem.

You must be able to access an extension connected to the switch (at the switch or remotely). You may have to be at the switch site so you can connect terminal equipment.

Test 1- Operation

Use test 1 to test all trunks in a trunk group with a selected trunk dial access code.

In test 1 you can:

View the test 1 screen	
Test trunks by dial access code	

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure, but not in test 1, enter `tl`

   ● Otherwise, enter `p642`

   The test 1 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 642, TEST: 1
                  TEST ALL TRUNKS BY DIAL ACCESS CODE


TEST LINE EQUIPMENT LOCATION            TRUNK DIAL ACCESS CODE
    2.   Module: ▢                         12.   First Digit: ▢
    3.  Cabinet: ▢                         13. Second Digit: ▢
    4.  Carrier: ▢                         14.  Third Digit: ▢
    5.     Slot: ▢                         15. Fourth Digit: ▢
    6.  Circuit: ▢
                                        16. Trunk Group: ▢
TRUNK EQUIPMENT LOCATION                17.  Test State: ▢
    7.   Module: ▢
    8.  Cabinet: ▢
    9.  Carrier: ▢
   10.     Slot: ▢
   11.  Circuit: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

The switch highlights field 2 if a default test line is not administered.

Fields 2-6 may contain a default test line equipment location (administered in Procedure 000 Word 1).

If there is a default test line, the switch highlights field 12.

To find the meaning of any field on your screen go to *Procedure Fields* at the end of this procedure.

To Test Trunks by Dial Access Code

1. To select a test line, enter `cf2` and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

   If you just enter the module the next assigned test line equipment location appears.

2. To select a dial access code, enter `cf12` and then enter the dial access code; up to four digits long.

3. Make sure that a telephone or handset is connected to the test line and is on hook.

4. Enter `x` to test the trunk.

   `WAIT` appears on your screen.

   Fields 2-6 show the test line equipment location.

   Fields 7-11 show the equipment location of the lowest numbered trunk in the trunk group.

   Fields 12-15 show the trunk dial access code (see Table 5-48).

   Field 16 shows the trunk group number.

   Field 17 shows the test state (see Table 5-49). If the test line is on-hook and available and if the trunk you selected is available, field 17 contains a 1. If the test line or the trunk is busy, field 17 contains a 0. Enter `x` to try again or select another trunk.

5. Take the telephone or hand test set off-hook and dial the trunk dial access code in fields 12-15.

   Field 17 changes to a 2.

   If Field 17 does not change to a 2 the trunk has been seized by an incoming central office (CO), foreign exchange (FX), or wide area telecommunications service (WATS) call. Field 17 contains a 9. Try again when the trunk is idle or select another trunk to test.

   Field 17 may change to a 3 as the call progresses. It may take from 1-10 seconds after you dial the last digit, until the call completes. If the trunk passes, the call either goes through or the test sequence completes the test sequence.

   If you get an intercept tone, check the class of service of the test line and either change it to the least restricted class of service, or enter an unrestricted test line in fields 2-6.

   If field 17 contains a 4, 6, 7, or 8 the terminal-to-trunk test call failed.

6. If field 17 contains a 4, check the dial access code in fields 12-15.

   If you dialed the correct dial access code, the trunk circuit is failing.

7. If field 17 contains a 6 go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) to test the trunk.

8. If field 17 contains a 7 or 8, repeat steps 3-8.

9. Repeat steps 3-9 for all trunks assigned to the trunk dial access code and trunk group in fields 12-16.

10. If you want to test the next untested trunk in the module enter `nc` and then repeat steps 3-10.

    After you view all trunks in the trunk group buffer, the switch dashes fields 7 through 11. If you enter `nc` again, the switch searches for any untested trunks in the buffer.

11. If you want to test the untested trunk in the next module, enter `nu` and then repeat steps 3-11.

    After you view all trunks in the trunk group buffer, the switch dashes fields 7 through 11. If you enter `nu` again, the switch searches for any untested trunks in the buffer.

    After the switch tests all trunks in the trunk group, field 17 contains a 5. If the trunk group has more than 63 trunks in it, special error code 80 appears in the message line. After the first 63 trunks pass, the trunk equipment location fields are dashed. Enter `nc` or `nu` to see the next untested trunk in the trunk group. The buffer is loaded again with the untested trunks.

    Repeat steps 3-11 for all additional trunks.

12. If you want to test another trunk group, repeat steps 1-12.

13. If you want to test a single trunk go to test 2.

14. If you want to test all trunks in the trunk group go to test 3.

Test 2 - Operation

Use test 2 to test a single trunk.

In test 2 you can:

View the test 2 screen

Test a single trunk

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p642
   - If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
ENHANCED MODE - PROCEDURE: 642, TEST: 2
                TEST A SPECIFIC TRUNK


TEST LINE EQUIPMENT LOCATION        TRUNK DIAL ACCESS CODE
   2.  Module: ▢                       12.   First Digit: ▢
   3. Cabinet: ▢                       13. Second Digit: ▢
   4. Carrier: ▢                       14.  Third Digit : ▢
   5.    Slot: ▢                       15. Fourth Digit: ▢
   6. Circuit: ▢
                                       16. Trunk Group: ▢
TRUNK EQUIPMENT LOCATION             17.   Test State: ▢
   7.  Module: ▢
   8. Cabinet: ▢
   9. Carrier: ▢
  10.    Slot: ▢
  11. Circuit: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[        ][     ][ F3 DATA ][     ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

   The switch highlights field 7.

   To find the meaning of any field on your screen go to *Procedure Fields* at the end of this procedure.

To Test a Single Trunk

1. Enter cf7 and enter the trunk module, cabinet, carrier, and slot.

2. To select a test line, enter cf2 and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

   If you just enter the module, the next assigned test line equipment location appears.

3. Make sure that a telephone or hand set is connected to the test line and is on hook.

4. Enter x to test the trunk.

   WAIT appears on your screen.

      Fields 2-6 Show the test line equipment location.

      Fields 7-11 show the equipment location of the lowest numbered trunk in the trunk group.

      Fields 12-15 show the trunk dial access code (see Table 5-48).

      Field 16 shows the trunk group number.

      Field 17 shows the test state (see Table 5-49). If the test line is on-hook and available and if the trunk you selected is available, field 17 contains a 1. If the test line or the trunk is busy, field 17 contains a 0. Enter x to try again or select another trunk.

5. Take the telephone or hand test set off-hook and dial the trunk dial access code in fields 12-15.

      Field 17 changes to a 2.

      If Field 17 does not change to a 2 the trunk has been seized by an incoming central office (CO), foreign exchange (FX), or wide area telecommunications service (WATS) call. Field 17 contains a 9. Try again when the trunk is idle or select another trunk to test.

      Field 17 may change to a 3 as the call progresses. It may take from one to ten seconds after you dial the last digit, until the call completes. If the trunk passes, the call either goes through or the test sequence completes.

      If you get an intercept tone, check the class of service of the test line and either change it to the least restricted class of service, or enter an unrestricted test line in fields 2-6.

      If field 17 contains a 4, 6, 7, or 8 the terminal-to-trunk test call failed.

6. If field 17 contains a 4, check the dial access code in fields 12-15.

   If you dialed the correct dial access code, the trunk circuit is failing.

7. If field 17 contains a 6 go to *DEFINITY*™ *Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) to test the trunk.

8. If field 17 contains a 7 or 8, repeat steps 3-8.

9. If you want to test all trunks with the same primary DAC, go to test 1.

10. If you want to test all trunks in the trunk group, go to test 3.

Test 3 - Operation

Use test 3 to test all trunks in a trunk group.

In test 3 you can:

View the test 3 screen   *page 5-239*

Test all trunks in a trunk group   *page 5-240*

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   • To start the procedure, enter `p642`

   • If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 642, TEST: 3
                TEST ALL TRUNKS IN A TRUNK GROUP


TEST LINE EQUIPMENT LOCATION        TRUNK DIAL ACCESS CODE
   2.   Module: □                      12.   First Digit: □
   3. Cabinet: □                       13. Second Digit: □
   4. Carrier: □                       14.   Third Digit: □
   5.     Slot : □                     15. Fourth Digit: □
   6. Circuit: □
                                       16. Trunk Group: □
TRUNK EQUIPMENT LOCATION             17.   Test State: □
   7.   Module: □
   8. Cabinet: □
   9. Carrier: □
  10.     Slot: □
  11. Circuit: □




Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT

enter command: ▄
│        ││      ││F3 DATA ││      ││F5 HELP ││F6 FIELD ││F7 INPUT ││F8 CMDS │
```

To find the meaning of any field on your screen go to *Procedure Fields* at the end of this procedure.

To Test all Trunks in a Trunk Group

1. To select a trunk group, choose from the following:

    • Enter cf16 and enter the trunk group.

    • If a trunk group is already on your screen, enter nc until the equipment location of the trunk you want to test appears.

2. Make sure that a telephone or handset is connected to the test line and is on hook.

3. Enter x to test the trunk.

    WAIT appears on your screen.

    Fields 2-6 show the test line equipment location.

    Fields 7-11 show the equipment location of the lowest numbered trunk in the trunk group.

    Fields 12-15 show the trunk dial access code (see Table 5-48).

    Field 16 shows the trunk group number.

    Field 17 shows the test state (see Table 5-49). If the test line is on-hook and available and if the trunk you selected is available, field 17 contains a 1. If the test line or the trunk is busy, field 17 contains a 0. Enter x to try again or select another trunk.

4. Take the telephone or hand test set off-hook and dial the trunk dial access code in fields 12-15.

    Field 17 changes to a 2.

    If Field 17 does not change to a 2, the trunk has been seized by an incoming central office (CO), foreign exchange (FX), or wide area telecommunications service (WATS) call. Field 17 contains a 9. Try again when the trunk is idle or select another trunk to test.

    Field 17 may change to a 3 as the call progresses. It may take from 1-10 seconds, after you dial the last digit, until the call completes. If the trunk passes, the call either goes-or the test sequence completes the test sequence.

    If you get an intercept tone, check the class of service of the test line and either change it to the least restricted class of service or enter an unrestricted test line in fields 2-6.

    If field 17 contains a 4, 6, 7, or 8 the terminal-to-trunk test call failed.

5. If field 17 contains a 4, check the dial access code in fields 12-15.

    If you dialed the correct dial access code, the trunk circuit is failing.

6. If field 17 contains a 6 go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) to test the trunk.

7. If field 17 contains a 7 or 8, repeat steps 3-7.

8. If you want to test all trunks with the same primary DAC, go to test 1.

9. If you want to test a single trunk, go to test 2.

TABLE 5-48

Field 12 First Digit		
0-9	=	Digits 0 to 9
11	=	Touch-tone *
12	=	Touch-tone #

TABLE 5-49

Field 17 Test State		
0	=	Test line or trunk not available
1	=	Test line on hook
2	=	Dial tone through dial completion
3	=	CO response (dial tone or busy)
4	=	Wrong access code
5	=	End of group test
6	=	Call aborted
7	=	No TT receiver or no time slot available
8	=	No trunk available
9	=	Trunk seized incoming

Special Error Codes

While using Procedure 642 you may see the following special error codes:

- ●`80=You can only test 63 trunks at a time`

    You tried to test a trunk group that has more than 63 trunks.

- ●`82=You cannot test this trunk type with Procedure 642`

    You cannot test data trunks (trunks with trunk type greater than 100) with this procedure.

Procedure Fields

The fields listed below are data entry fields.

- ●In all tests, you can change the test line equipment location in fields 2-6.
- ●In test 1 you can select the trunk dial access code in fields 12-15.
- ●In test 2 you can select the trunk equipment location in field 7.
- ●In test 3 you can select the trunk group in field 16.

The meaning of the fields are:

2-6.	TEST LINE EQUIPMENT LOCATION	Shows the module, cabinet, carrier, slot, and circuit of test line.
7-11$_0$	TRUNK EQUIPMENT LOCATION	Shows the module, cabinet, carrier, slot, and circuit of the trunk you want to test.
12-15.	TRUNK DIAL ACCESS CODE	Shows the digits of the trunk dial access code. A trunk access code may have 1,2,3, or 4 digits.
16.	Trunk Group	Shows which trunk group you are viewing.
17.	Test State	Shows the test call state. Table 5-49 lists the test call states.

PROCEDURE 643 - TERMINAL-TO-TONE TEST CALL

Purpose

Use Procedure 643 to test tones when failures are reported by users or detected by the switch.

Tests

Procedure 643 has two tests.

- Use test 1 to transmit all tones sequentially from the tone plant.
- Use test 2 to select and transmit tones in any order from the tone plant.

Procedure Overview

The switch uses a tone board to transmit eight tones to terminals. These tones give you feedback as a call progresses. The eight tones are: busy, reorder, audible alert, special audible alert, dial, recall, miscellaneous, and interrupt. In a traditional module, circuit pack SN250 generates the tones. In a universal module, circuit pack TN768 (the tone clock board) generates these tones and auxiliary tones.

To test each tone, you must listen to each tone to find if there is any attenuation, improper interruption rates, or interference from other tones. Table 5-50 shows the frequency and interruption rate for each tone. You must beat the switch site, or at a test line connected to the switch, to listen to the tones.

To listen to the tones, it is easiest to use a station connected to the switch and administer it as the test line. If you cannot do this, you may need the equipment in Table 5-51.

TABLE 5-50

Tones		
Tone	**Frequency**	**Interruption Rate**
Busy	480 and 620 Hz	0.5 seconds on and 0.5 seconds off
Reorder	480 and 620 Hz	0.25 seconds on and 0.25 seconds off
Audible Alert	440 and 480 Hz	1 second on and 3 seconds off
Special Audible Alert	440 and 480 then 440 Hz	0.9 seconds, 0.2 seconds on and 2.9 seconds off
Dial	350 and 440 Hz	Steady
Recall	350 and 440 Hz	0.1 second on, 0.1 second off
Miscellaneous	440 Hz	Steady
Intercept	440/620	0.25 seconds alternating

TABLE 5-51

Suggested Test Equipment		
Quantity	**Description**	**Comcode**
1	Analog Telephone set	None
2	W1AP test cords	1025004O2
1	249A Adapter	102581071
	or	
1	1013 type hand test set with a 249A adapter	104227752 102581071

Use test 1 to listen to all tones and ensure that all tones are present and working properly. If there is a problem with a single tone use test 2 to listen to a specific tone.

If you cannot isolate problems with tones with Procedure 643, go to Procedure 620 Test 4 and test unit type 16 to isolate and repair the problem.

Use the following flowchart to guide you from test to test. You may want to remove the flowchart and refer to it as you use this procedure.
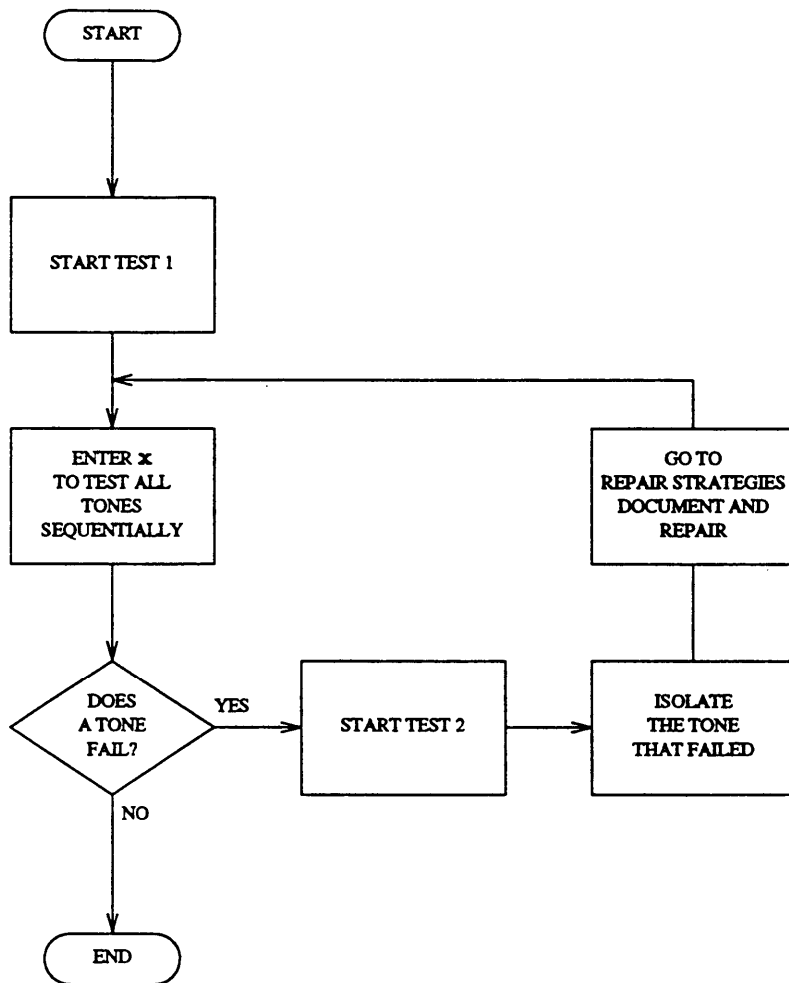
Figure 5-15. To Test Tones

Test 1 - Operation

Use test 1 to transmit all tones sequentially from the tone plant.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    ● If you are already in the procedure, but not in test 1, enter `tl`

    ● Otherwise, enter `p643`

    The test 1 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 643, TEST: 1
                      TEST ALL TERMINAL TONES

TEST LINE EQUIPMENT LOCATION          TRANSMITTED  TONE
   2.   Module: ▢                      11.             Busy : ▢
   3. Cabinet: ▢                       12.           Reorder: ▢
   4. carrier: ▢                       13.      Audible Alert: ▢
   5.   Slot: ▢                        14. Special Audible Alert: ▢
   6. Circuit: ▢                       15.             Dial: ▢
                                       16.           Recall: ▢
TONE PLANT EQUIPMENT LOCATION          17.    Miscellaneous: ▢
   7.   Module: ▢                      18.        Intercept: ▢
   8. Cabinet: ▢
   9. Carrier: ▢
  10.   Slot : ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

> The switch highlights field 2.
>
> Fields 2-5 show the default test line equipment location.
>
> Fields 7-10 show the equipment location of the first tone plant.
>
> Fields 11-16 all contain a `1`.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of the procedure.

To Select a Test Line or Tone Plant

If you want to change the default test line, add a new test line, or find the equipment location of the test line use Procedure 000 Word 1.

1. To select a test line equipment location, enter `cf2` and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

   The test line must be in service and not busied out. When you enter the module number in field 2, the first translated test line m the module appears.

2. To select a tone plant, choose from the following:

   - Enter `nc` to see the next tone plant in the switch.

   - Enter `nu` to see the first tone plant in the next module.

   - Enter `cf7` and then enter the tone plant module, cabinet, carrier, and slot in fields 7-10.

3. To test the tone plant with the test line you selected, go to *To Test a Tone.*

To Test a Tone

1. Make sure that a telephone set or hand test set is connected to the test line.

2. Enter `x` to test a tone.

    The switch sends the busy tone.

    Fields 11-18 contain a 1. The 1 flashes when the tone is tested.

3. Take the telephone or hand test set off-hook and listen to the tone.

4. If the tone is attenuated, if the interruption rate is wrong, or if there is interference from other tones, go to test 2 and test the tone.

5. Enter `nd` to hear each tone.

    The 1 in the active field flashes as the tone is tested.

6. If this is not the last tone you want to hear repeat steps 5 and 6.

    After you select field 18 the switch selects field 11.

7. To stop the test, enter `nc` or `rs`

8. If you want to select another tone plant, go to *To Select a Test Line or Tone Plant.*

9. If you want to test a single tone, go to test 2.

Test 2 - Operation

Use test 2 to transmit a selected tone from the specified tone plant.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    ● To start the procedure, enter `p643`

    ● If you are already in the procedure, but not in test 2, enter `t2`

    The test 2 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────┐
│           ENHANCED MODE - PROCEDURE: 643, TEST: 2              │
│                 TEST A SINGLE TERMINAL TONE                    │
│                                                                │
│ TEST LINE EQUIPMENT LOCATION      TRANSMITTED  TONE            │
│    2.   Module: ⬜                  11.            Busy : ⬜      │
│    3.  Cabinet: ⬜                  12.         Reorder: ⬜      │
│    4.  Carrier: ⬜                  13.      Audible Alert: ⬜   │
│    5.    Slot: ⬜                   14. Special Audible Alert: ⬜ │
│    6. Circuit: ⬜                   15.            Dial: ⬜      │
│                                    16.          Recall: ⬜      │
│ TONE  PLANT EQUIPMENT LOCATION     17.   Miscellaneous: ⬜      │
│    7.   Module: ⬜                  18.       Intercept: ⬜      │
│    8. Cabinet: ⬜                                               │
│    9. Carrier: ⬜                                               │
│   10.    Slot: ⬜                                               │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│ Connected to CC0 ON-LINE ♡ ┌MAJOR┐ ┌MINOR┐ ┌RUN TAPE┐ ┌BUSY OUT┐ ┌IN USE┐ ┌WAIT┐ │
│                                                                │
│ enter command: ▄                                               │
│ ┌────┐┌────┐┌F3 DATA┐┌────┐  ┌F5 HELP┐┌F6 FIELD┐┌F7 INPUT┐┌F8 CMDS┐ │
└──────────────────────────────────────────────────────────────┘
```

The switch highlights field 2.

Fields 2-5 show the default test line equipment location.

Fields 7-10 show the equipment location of the first tone plant.

Fields 11-16 all contain a 1.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Test Line or Tone Plant

You can use Procedure 000 Word 1 to change the default test line, add a new test line, or find the equipment location of the test line.

1. To select a test line equipment location, enter cf2 and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

   The test line must be in service and not busied out. When you enter the module in field 2, the first translated test line in the module appears.

2. To select a tone plant, choose from the following:

   - Enter nc to see the next tone plant in the system.

   - Enter nu to see the first tone plant in the next module.

   - Enter cf7 and then enter the tone plant module, cabinet, carrier, and slot in fields 7-10.

3. To test the tone plant with the test line you selected, go to *To Test a Tone*.

To Test a Tone

1. Make sure that a telephone set or hand test set is connected to the test line.

2. Enter `cf` and the number of the field you want to change and then enter a 1 in the field you selected.

    To bypass a tone, enter ;

    Select all the tones you want to send. The switch sends the tones in the order you select them.

3. Enter `x` to test the first tone you selected.

    If you have not selected a tone, special error code 80 appears on the message line. Select a tone.

    As the tone is tested the `1` flashes in the field you selected.

4. Take the telephone or hand test set off-hook and listen to the tone.

5. If the tone is attenuated, if the interruption rate is wrong, or if there is interference from other tones go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for user report troubles.

6. Enter `nd` to test the next tone you selected.

7. To stop the test, enter `nc` or `rs`

8. If this is not the last tone you selected repeat steps 4-8.

9. If you want to select another test line or tone plant, go to *To Select a Test Line and Tone Plant.*

Special Error Codes

While using Procedure 643 you may see the following special error codes:

- `80=You did not select a tone.  Select a tone and try again.`

    You tried to test a tone, without first selecting a tone to send. Select a tone and then try again.

- `81=The tone plant in the universal module is not active.`

    Only one tone plant in a universal module is active at a time. To activate the inactive tone plant in a universal module, busy out the the active tone plant with Procedure 620 or 635.

Procedure Fields

The fields listed below are data entry fields.

- You can select the test line equipment location in fields 2-6.

- You can select the equipment location of the tone plant in fields 7-10.

- In test 2, you can select the order and tones you want the switch to transmit in fields 11-18.

The meaning of the fields are:

2-6.	TEST LINE EQUIPMENT LOCATION	Shows the equipment location of the test line you use to test the tone circuit pack.
7-10.	TONE PLANT EQUIPMENT LOCATION	Shows the equipment location of the tone plant you want to test.
11-18.	TRANSMITTED TONE	Shows the state of each tone. A 1 flashes in the field that is currently being tested.

PROCEDURE 644 - TERMINAL-TO-AUXILIARY-TONE TEST CALL

Purpose

Use Procedure 644 to test auxiliary tones when failures are reported by users or detected by the switch.

Tests

Procedure 644 has two tests.

- Use test 1 to transmit all tones sequentially from the auxiliary tone plant.

- Use test 2 to select and transmit tones in any order from the auxiliary tone plant.

Procedure Overview

The switch uses an auxiliary tone board to transmit six auxiliary tones to terminals. The tones give you feedback as a call progresses. The six tones are: immediate audible alert, zip, remote hold, data answer, preemption, precedence audible alert. In a traditional module, circuit pack SN253 generates the auxiliary tones. In a universal module, circuit pack TN768 (the tone clock board), generates all tones and auxiliary tones.

To test these tones you must listen for attenuation, incorrect interruption rate, or interference from other tones. You must be able to listen to the tones from a test line connected to the switch. In a universal module the preemption tone will only contain one frequency (620 Hz). In a universal module the preemption tone is generated by combining the 620 Hz tone with the miscellaneou tone (tested in Procedure 643).

Table 5-52 shows the frequency and interruption rate for each tone.

To listen to the auxiliary tones it is easiest to just use a station connected to the switch and administer it as the test line. If you cannot do this, you may need the equipment in Table 5-53.

TABLE 5-52

Auxiliary Tones		
Tone	**Frequency**	**Interruption Rate**
Immediate Audible Alert	440 and 480 Hz	Steady
Zip	480 Hz	Steady
Remote Hold	440HZ	0.5 seconds on, 0.5 seconds off
Data Answer	2225 Hz	Steady
Preemption Tone	440 and 620 Hz	Steady
Precedence Audible Alert	440 and 480 Hz	1.6 seconds on and 0.3 seconds off

TABLE 5-53

Suggested Test Equipment		
Quantity	**Description**	**Comcode**
1	Analog Telephone set	None
2	W1AP test cords	102500402
1	249A Adapter	102581071
	or	
1	1013 type hand test set with a 249A adapter	104227752 102581071

Use test 1 to listen to all tones in the order on your screen and ensure that all tones are present and working properly. If there is a problem with an auxiliary tone, use test 2 to select and listen to a specific tone. If you cannot isolate the problem, go to Procedure 620 Test 4 and test unit type 31 to isolate and repair the problem.

Use the following flowchart to guide you from test to test. You may want to remove the flowchart and refer to it as you use this procedure.
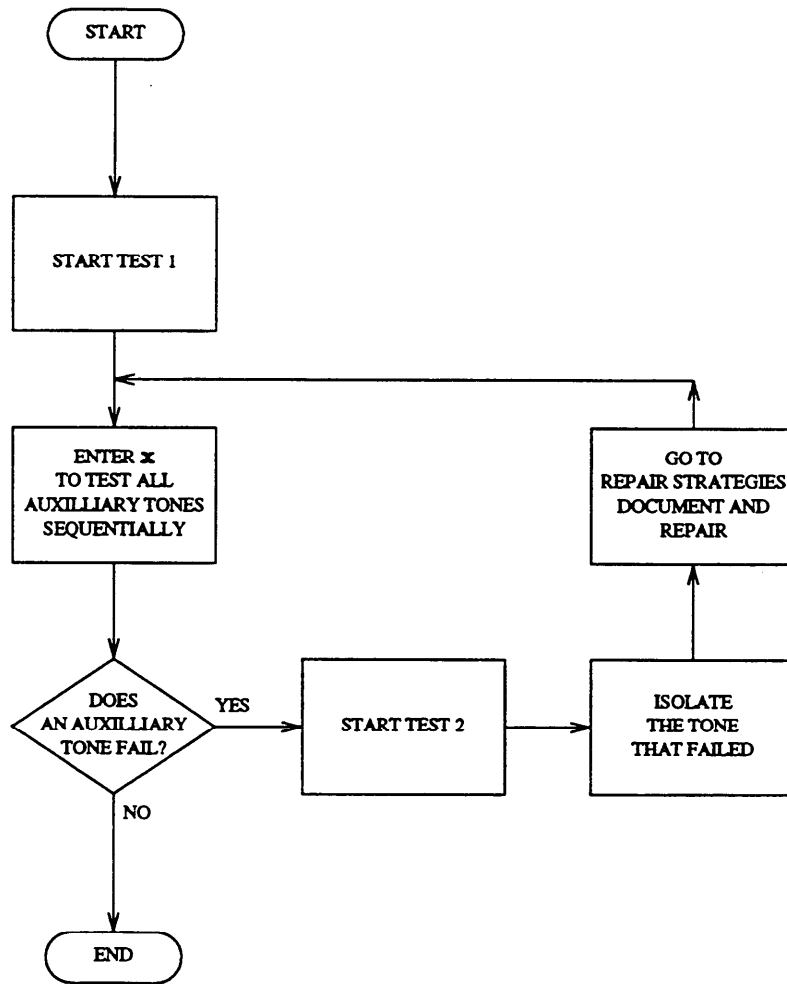
Figure 5-16. To Test Auxiliary Tones

Test 1 - Operation

Use test 1 to transmit all tones sequentially from the auxiliary tone plant.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    ● If you are already in the procedure, but not in test 1, enter tl

    ● Otherwise, enter p644

The test 1 screen, similar to the following, appears.

```
               ENHANCED MODE - PROCEDURE: 644, TEST: 1
                    TEST ALL TERMINAL AUXILIARY TONES


TEST LINE EQUIPMENT LOCATION          TRANSMITTED TONE
    2.   Module: ▢                    11.   Immediate Audible Alert: ▢
    3. Cabinet: ▢                     12.                      Zip: ▢
    4. Carrier: ▢                     13.              Remote Hold: ▢
    5.    Slot: ▢                     14.              Data Answer: ▢
    6. Circuit: ▢                     15.               Preemption: ▢
                                      16. Precedence Audible Alert: ▢
AUXILIARY TONE PLANT EQUIPMENT LOCATION
    7.   Module: ▢
    8. Cabinet: ▢
    9. Carrier: ▢
   10.    Slot: ▢






Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT

enter command: ▬
            || F3 DATA  ||       || F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS
```

highlights field 2.

Fields 7-10 show the equipment location of the first auxiliary tone plant.

Fields 11-14 all contain a `1`.

Fields 15 and 16 contain a 1 if the auxiliary tone plant is in a traditional module and are dashed if the auxiliary tone plant is in a universal module.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Test Line or Auxiliary Tone Plant

You can use Procedure 000 Word 1 to change the default test line, add a new test line, or find the equipment location of the test line.

1. To select a test line equipment location, enter cf2 and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

   The test line must be in service and not busied out. When you enter the module number in field 2, the first translated test line in the module appears.

2. To select an auxiliary tone plant, choose from the following:

   - Enter `nc` to see the next auxiliary tone plant in the switch.
   - Enter `nu` to see the first auxiliary tone plant in the next module.
   - Enter `cf7` and then enter the auxiliary tone plant module, cabinet, carrier, and slot in fields 7-10.

3. To test the auxiliary tone plant, with the test line you selected, go to *To Test an Auxiliary Tone.*

To Test an Auxiliary Tone

1. Make sure that a telephone set or hand test set is connected to the test line.

2. Enter `x` to test the auxiliary tone.

   The switch sends the immediate audible alert tone.

   All fields contain a 1. The 1 flashes when the auxiliary tone is tested.

3. If the tone is attenuate if the interruption rate is wrong, or if there is interference from other tones, go to test 2 and test the tone.

4. Enter `nd` to hear each auxiliary tone.

   The 1 in the active field flashes as the tone is tested.

5. If this is not the last tone you want to hear, repeat steps 4 and 5.

   After you select field 16, the switch highlights field 11.

6. To stop the test, enter `nc` or `rs`

7. If you want to select another auxiliary tone plant or test line, go to *To Select a Test Line or Auxiliary Tone Plant.*

8. If you want to test a single tone, go to test 2.

Test 2 - Operation

Use test 2 to transmit a single tone from the auxiliary tone plant.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   ● To start the procedure, enter p644

   ● If you are already in the procedure, but not in test 2, enter t2

   The test 2 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 644, TEST: 2
                 TEST A SINGLE AUXILIARY TERMINAL TONE

 TEST LINE EQUIPMENT LOCATION          TRANSMITTED TONE
    2.  Module: ⬕                        11.   Immediate Audible Alert: ⬕
    3.  Cabinet: ⬕                       12.                      Zip: ⬕
    4.  Carrier: ⬕                       13.              Remote Hold: ⬕
    5.    Slot: ⬕                        14.              Data Answer: ⬕
    6.  Circuit: ⬕                       15.               Preemption: ⬕
                                         16. Precedence Audible Alert: ⬕

 AUXILIARY TONE PLANT EQUIPMENT LOCATION
    7.   Module: ⬕
    8.  Cabinet: ⬕
    9.  Carrier: ⬕
   10.    Slot : ⬕




 Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

 enter command: ▂
 |_____||____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

Fields 2-6 show the equipment location of the default test line, if one is assigned.

Fields 7-10 show the equipment location of the first auxiliary tone plant.

The switch highlights field 11. Fields 11-16 all contain a 0. A 0 means that the tone is not being tested.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Test Line or Auxiliary Tone Plant

If you want to change the default test line, add a new test line, or find the equipment location of the test line use Procedure 000 Word 1.

1. To select a test line equipment location, enter `cf2` and then enter the test line module, cabinet, carrier, slot, and circuit in fields 2-6.

    The test line must be in service and not busied out. When you enter the module number in field 2, the first translated test line in the module appears.

2. To select an auxiliary tone plant, choose from the following:

    - Enter `nc` to see the next auxiliary tone plant in the switch.

    - Enter `nu` to see the first auxiliary tone plant in the next module.

    - Enter `cf7` and then enter the auxiliary tone plant module, cabinet, carrier, and slot in fields 7-10.

3. To test the auxiliary tone plant with the test line you selected, go to *To Test an Auxiliary Tone.*

To Test an Auxiliary Tone

1. Make sure that a telephone set or hand test set is connected to the test line.

2. To select a tone for transmission, enter `cf` and the number of the field you want to test, and then enter a 1 in the field you want to test.

   To bypass a tone, enter ;

   Select all tones you want to send. The switch sends them in the order you select them.

3. Enter `x` to test an auxiliary tone.

   As the switch transmits the tone, the 1 flashes on your screen.

4. Take the telephone or hand test set off-hook and listen to the tone.

5. If the tone is attenuated, if the interruption rate is wrong, or if there is interference from other tones, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for user report troubles.

6. Enter `nd` to send each tone.

7. To stop the test, enter `nc` or `rs`

8. If this is not the last tone you selected, repeat steps 4-8.

9. If you want to select anther test line or tone plant, go to *To Select a Test Line and Auxiliary Tone Plant.*

Special Error Codes

While using Procedure 644 you may see the following special error codes:

- 80=You did not select a tone. Select a tone and try again.

    You tried to test a line, without first selecting a tone to send. Select a tone and then try again.

- 81=The tone plant in the universal module is not active.

    Only one tone plant in a universal module is active at a time. A universal tone plant can only be tested if it is active. To activate the inactive tone plant in a universal module, busy out the the active tone plant with Procedure 620 or Procedure 635.

Procedure Fields

The fields listed below are data entry fields.

> You can enter the test line equipment location in fields 2-6.

> You can enter the auxiliary tone plant equipment location in fields 7-10.

> In test 2 you can select the tones and the order you want to transmit them in field 11-16.

The meaning of the fields are:

2-6.	TEST LINE EQUIPMENT LOCATION	Shows the equipment location of the line you want to use to test the auxiliary tone plant.
7-9.	AUXILIARY TONE PLANT EQUIPMENT LOCATION	Shows the equipment location of the auxiliary tone plant.
11-16.	TRANSMITTED TONE	Shows the state of the tone. A 1 flashes in the field that is currently being tested. A 0 appears when the tone is not being tested.

PROCEDURE 646 - ADFTC OR MTCP, MODEM POOLING, AND DIGITAL FACILITY TESTS

Purpose

Use Procedure 646 to test the analog/digital facility test circuit pack (ADFTC) or the maintenance test circuit pack (MTCP), modem pool members (MPM) and digital facilities (DF).

Tests

Procedure 646 has three test.

- Use test 1 to do a detection test on an ADFTC or MTCP circuit pack.
- Use test 2 to do a detection test on MPMs or DFs.
- Use test 3 to do a diagnostic test on an MPM or a DF.

Procedure Overview

Use Procedure 646 to test the ADFTC or MTCP, MPMs, and DFs.

Procedure 646 uses an ADFTC or MTCP (a test circuit pack) to test a MPM or a digital facility. In test 1 you can select from the following test types to test the ADFTC or MTCP circuit pack.

- A one port test (test type 1) where the switch internally connects port 1 through the switch and back to port 1 on the ADFTC or MTCP, and does a detection test (see Figure 5-17, *Test 1- One Port ADFTC or MTCP Self Test).*

- A two port normal test (test type 2) or a two port reverse test (test type 3), where the switch internally connects port 1 through the switch to port 2 (or from port 2 to port 1 for-the reverse test) on the ADFTC or MTCP and does a detection test (see Figure 5-17, *Test 1- Two Port ADFTC or MTCP Self Tests).*

- All of the above tests (test type 0).

Note that you cannot test port 0 (circuit number 0 on the ADFTc or MTCP) with Procedure 646. You must use Procedure 620 to test port 0.
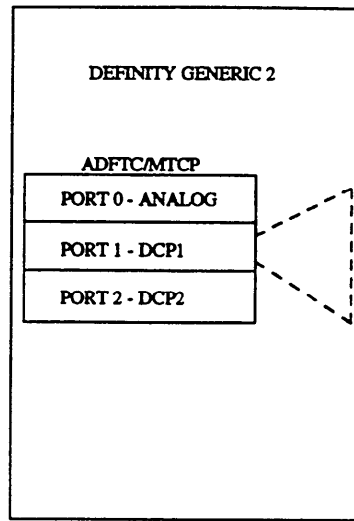
Figure 5-17. Test 1- One Port ADFTC or MTCP Self Test
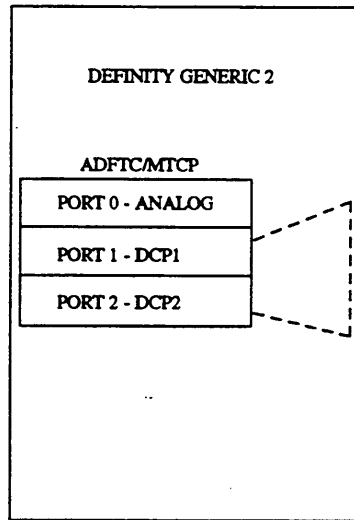
Figure 5-18. Test 1- Two Port ADFTC or MTCP Self Test

Modem pooling provides a pool of conversion resources, available as needed, to convert analog data signals to the digital communications protocol (DCP) and back. Each modem pool supports a specific set of parameters, such as synchronous or asynchronous transmission, full or half-duplex transmissions. A group of modems with similar parameters is a modem pool group (MPG). Often a modem pool supports only one data rate but since most modems can respond to a range of data rates this is not always the case.

In test 2 you can select one or two MPMs, one DF or a group of DFs, all circuits in a group, or all testable MPM and DF groups. You can run detection tests on MPMs and DFs translated as trunks (except for DS1 trunks).

In test 2 you can select from the following test types.

- Two port originating normal or reverse test - test types 3 and 4 (see Figure 5-19, *Tests 2 and 3- Two Port Modem Pool Tests).*

- One port originating normal or reverse test - test types 7 and 8 (see Figure 5-20, *Tests 2 and 3- One Port Modem Pool or Digital Facility Test).*

- Host access tests (test type 0).

- All of the above tests (test type 0).
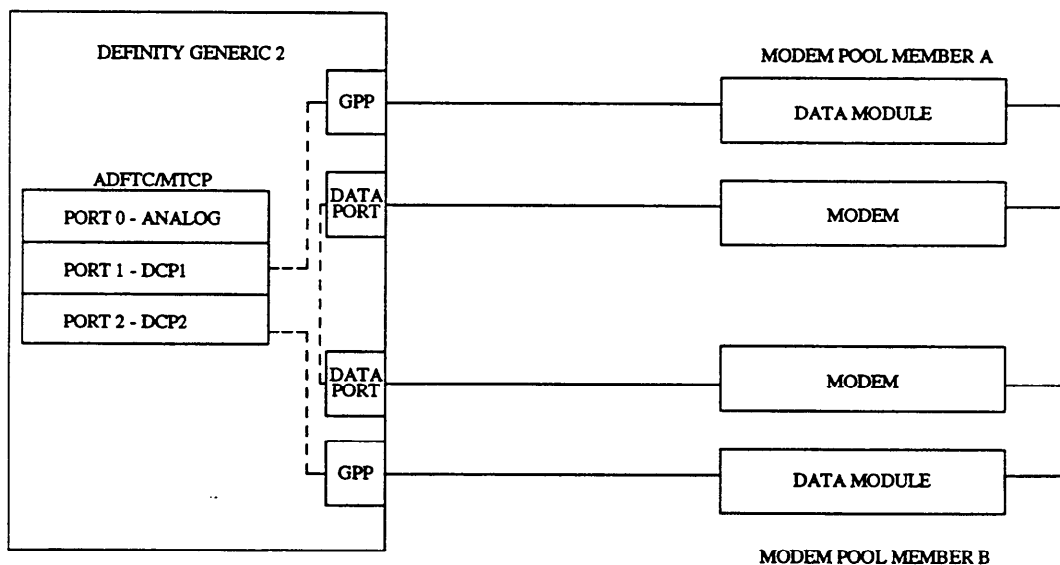
Figure 5-19. Tests 2 and 3 - Two Port Modem Pool Tests

In test 3, the remote loopback in the TDM or MTDM is activated while running half duplex digital tests. For the full duplex MPM test, the remote loopback in the TDM or MDPM and the EIA local and remote loopback in the analog modem are activated in sequence to isolate the fault. For DFs, translation determines the different places the loopback may be done.

In test 3 you can select from the following test types.

- Remote loopback tests (see Figure 5-21, *Tests 2 and 3 - Loopback Tests).*

- Local loopback tests (see Figure 5-21, *Tests 2 and 3 - Loopback Tests).*

- Remote loopback originating or terminating tests.

- All of the above tests (test type 0).
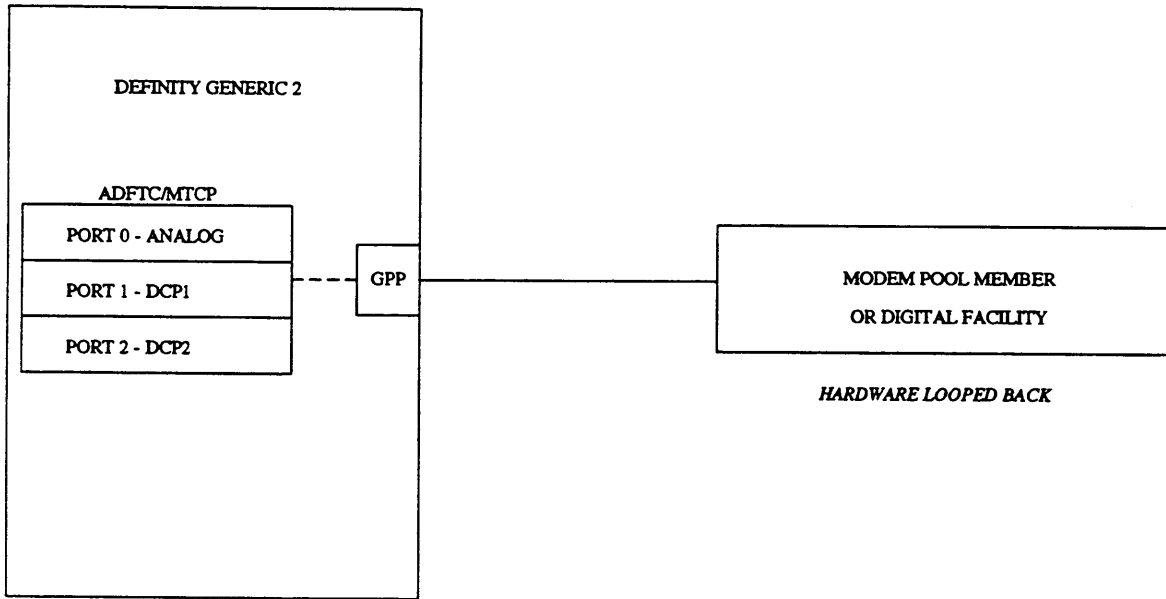
Figure 5-20. Tests 2 and 3 - One Port Modem Pool or Digital Facility Test
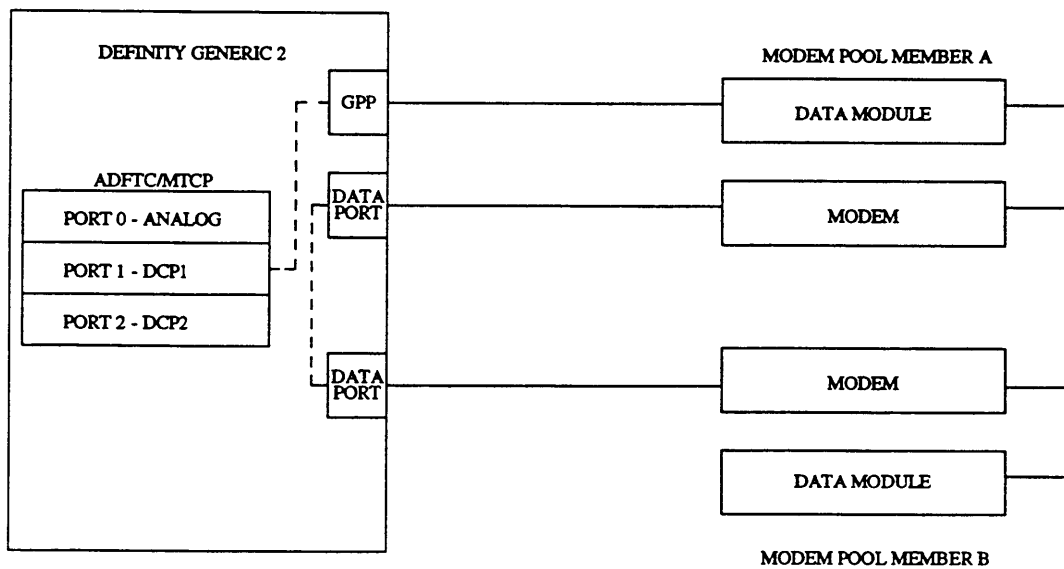
Figure 5-21. Tests 2 and 3 - Loopback Tests

Test 1 - Operation

Use test 1 to run a detection test on ADFTC or MTCP circuits.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure but not in test 1, enter `t1`

   - Otherwise, enter `p646`

   The test 1 screen, similar to the following, appears.

```
        ENHANCED MODE - PROCEDURE: 646, TEST: 1
           DO A DETECTION TEST ON ADFTC CIRCUITS

 2. Test Type: ▢


EQUIPMENT  LOCATION
   7.  Module: ▢
   8. Cabinet: ▢
   9. Carrier: ▢
  10.    Slot: ▢
  11. Circuit: ▢

12. Number of Failures: ▢


TEST DATA
  13. Data Type: ▢
  14.     Data: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

   The switch highlights field 2.

   Fields 7-11 may contain a default equipment location from test 2 or 3 or from Procedure 600 Test 1-3 or from Procedure 620.

Field 13 may show a default maintenance busy status of port 1 (see Table 5-62).

Note that if port 0 is busy the ADFTC or MTCP circuit pack can not be used. You will not discover this unless you try to run test 2 or test 3. If you busy out the ADFTC, both ports will be busied out. If you then release the ADFTC from busy, both ports will be available.

On the MTCP, port 0 and port 1 are independent. If you busy out and release port 1, port 0 may still not be available. All MTCP two port test types, however, use port 2. If port 2 is busy, it is automatically released from busy during two port test type in test 1. You cannot busy out or release port 2.

Field 14 may show a specific fault code for the default circuit.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Test Type and ADFTC or MTCP Circuit

1. Enter the test type in field 2 (see Table 5-58).

2. If you want to select all ADFTC or MTCP circuits in the switch, enter `cf7` and then enter ; to blank fields 7-11.

3. If you want to select all ADFTC or MTCP circuits in a module, enter `cf7` and then enter the module in field 7.

4. If you want to select all ADFTC or MTCP circuits in a cabinet, enter `cf7` and then enter the module and cabinet in fields 7 and 8.

5. If you want to select all ADFTC or MTCP circuits in a carrier, enter `cf7` and then enter the module, cabinet, and carrier.

6. If you want to select a specific ADFTC or MTCP circuit, enter `cf7` and then enter the module, cabinet, carrier, and slot.

7. Go to *To Do a Detection Test.*

To Do a Detection Test

1. Make sure that you have selected a circuit or range of circuits to test.

2. Enter x to test the ADFTC or MTCP circuit or range.

    WAIT appears on your screen. It may take up to 30 seconds to test an ADFTC or MTCP circuit.

    If you selected test type 0, the switch does a type 1 test, a type 2 test, and then a type 3 test.

    > Field 2 shows the test type as the test progresses (see Table 5-58). If you selected any other test type, field 2 does not change.

    If the switch finds an ADFTC or MTCP circuit in use because of a periodic test, the switch stops the periodic test and tests the ADFTC or MTCP circuit.

    If you selected a range of circuits, the following fields change as the switch tests each circuit in the range.

    > Field 2 shows the test type (see Table 5-51).

    > Fields 7-11 show the ADFTC or MTCP port equipment location.

    > Field 13 shows the data type and contains a 2 (see Table 5-62).

    > Field 14 shows the bit error rate and the number of bits received. To interpret the bit error rate and the number of bits received, refer to Figure 5-22. The switch updates field 14 every ten seconds.

    If you want to stop the test before the circuit or range is tested, enter s

    If a range has not been tested once or if all tests have not been done, special error code 95 appears. The switch continues to test the circuit on your screen. When the circuit is tested special error code 82 appears.

    > Fields 7-11 show the last ADFTC or MTCP circuit tested.

    > Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

    > Field 14 contains a 1 if all test types you selected were done.

    Enter nc if you want to view failure information, enter x to start the test again from where it stopped, or go to *To Select a Circuit or a Range of Circuits* to select a new range. If you enter x, all test results are kept.

    When the test is done, WAIT disappears from your screen.

    > Field 2 shows the test type (see Table 5-58).

    > Fields 7-11 show the ADFTC or MTCP port equipment location.

    > Field 13 shows the data index and contains a 4 (see Table 5-62).

    > Field 14 shows the number of circuits tested.

3. Enter `nc` to see each ADFTC or MTCP circuit.

Failures and specific fault codes appear first. Passing circuits appear next. Bit and block error rates appear for failing and passing circuits.

If you selected more than one test type, data appears for each test type for each ADFTC or MTCP circuit that was tested.

Field 2 shows the test type (see Table 5-51).

Fields 7-11 show the ADFTC or MTCP port equipment location.

Field 13 shows the data type and contains a 1 (see Table 5-62).

Field 14 may show a specific fault code. Record this number.

4. If you want to see data for each test type you selected, choose from the following:

- To see the bit error rate and the number of bits received, enter `nf` until field 13 contains a 2.

   Field 14 shows the bit error rate and the bit received.

   To interpret the bit error rate refer to Figure 5-22.
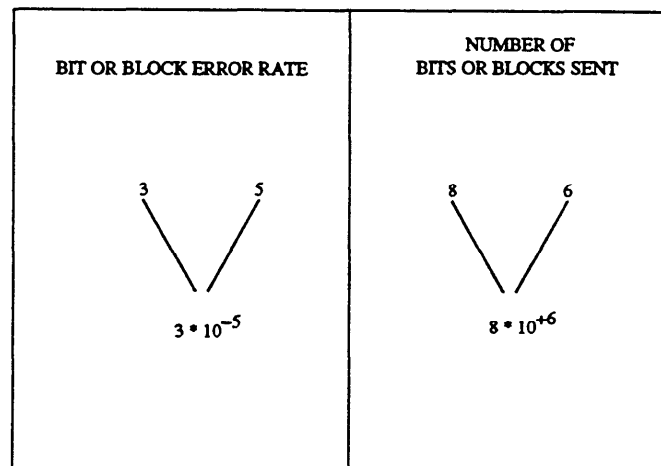
Figure 5-22. Bit and Block Rate Analysis

- To see the block error rate and the number of blocks received, enter `nf`

   Field 14 shows the block error rate and the number of block received. To interpret the block error rate refer to Figure 5-22.

After you view the block error rate and number of blocks received of the last test type you selected for the circuit tested, the switch dashes all fields on your screen. If you enter `nf` again, field 13 contains a 1 and field 14 shows the specific fault code.

After you view all data indexes, the switch dashes all fields. If you enter `nf` again, data index 1 appears.

5. If there are any ADFTC or MTCP failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 62.

6. If this is not the last circuit tested repeat steps 3-6.

    If a circuit is tested with a test type of 0 (all tests) and there are no failures, the circuits ADFTC or MTCP alarms are marked resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

7. If you want to do another test or select another ADFTC or MTCP circuit, go to *To Select a Test Type and an ADFTC or MTCP Circuit.*

8. If you want to do a detection test on MPMs or DFs go to test 2.

9. If you want to do a diagnostic test on MPMs or DFs go to test 3.

Test 2 - Operation

Use test 2 to do a detection test on MPMs and DFs.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter `p646`

   - If you are already in the procedure, but not in test 2, enter `t2`

     The test 2 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURES 646, TEST: 2
            DO A DETECTION TEST ON MODEM POOL MEMBERS AND DIGITAL FACILITIES

 2. Test Type:     □
CIRCUIT LOCATION
    3. Trunk Group Number:  □
    4.            Member A:  □
    5.            Member B:  □
EQUIPMENT LOCATION
    6. Equipment Type:  □
    7.          Module:  □
    8.         Cabinet:  □
    9.         Carrier:  □
   10.           Slot :  □
   11.         Circuit:  □

12. Test Length or Number of Failures:  □
TEST DATA
   13. Data Type:  □
   14.     Data:  □

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▄
[_____][_____][ F3 DATA ][_____][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

The switch highlights field 2.

Fields 3-11 may show the default trunk number and equipment location of the default trunk from test 3, from Procedure 600 Test 1 or 2, or from Procedure 620 (if the equipment location is a general purpose port (GPP) or data port which is part of an MPM or DF). Record the default equipment location. If you select an ADFTC or MTCP you have to enter the default equipment again.

Field 13 may show the maintenance busy status of the default circuit (see Table 5-62).

Field 14 may show the specific fault code of the default circuit.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select Test Parameters

You must select a test type and an MPM or DF to test. You may select an ADFTC or MTCP to use for testing, a circuit or a range to test, the test length, or the baud rate.

To Select a Test Type and an ADFTC or MTCP

1. Enter cf2 and enter the test type in field 2 (see Table 5-59).

   You cannot use each test type for all types of MPMs or DFs. Table 5-54 shows the MPM test 2 constraints.

TABLE 5-54

Test 2 Test Constraints	
Modem Type	**Test Type**
Originating and terminating	All tests except one port tests (test types 0-6)
Originating only	All tests (type 0), All originating tests (type 1), and one port originating tests (type 7)
Terminating only	All tests (type 0), all terminating tests (type 2), and one port terminating tests (type 8)
Digital facilities or host access	All tests (type 0)

Modem types you can test include, type 103J, 113C, 113D, 202S, 201C, 208B, 2224A, 2224G, 212A, and 2296A modems.

2. If you want to select an ADFTC or MTCP, enter `cf6 0` and enter the module, cabinet, carrier, and slot of the ADFTC or MTCP you want to use.

   If you do not select an ADFTC or MTCP, the switch selects the first idle ADFTC or MTCP.

To Select MPMs or Digital Facilities by Trunk Group, Member A, or Member B

If you want to select a member A or member B in a trunk group select the trunk group and then select the member A or member B.

1. If you want to test all trunk groups in the switch, enter `cf3` and then enter ; to blank out fields 2-11.

   The switch tests all trunk groups with the test type you selected.

2. If you want to test all trunks in a trunk group choose from the following:

   - Enter `cf3` and enter the trunk group in field 3.

   - If you do not know the trunk group number, enter `nu` until the trunk group you want to test appears.

     The switch tests all members of the trunk group (if you do not select a member A).

3. If you want to select a member A, enter `cf4` and enter the member A.

   To test a member A with any member B do not select a member B.

   To test a specific member A with a specific member B, enter the member A and then select the member B.

   You can now enter `nc` to step through the member As. If a member B is on your screen, it will not appear as a member A.

   Field 6 contains a 1 (see Table 5-61).

   Fields 7-11 show the member A GPP equipment location.

   Field 13 shows the maintenance busy status of the member A (see Table 5-62).

4. If you want to select a member B, enter `cf5` and enter the member B.

   To test all member A's with a member B that you know is working correctly, enter the member B and do not select a member A.

   To test a DF or a MPG with one way modems, the member B field must be blank.

5. If fields 3-5 and fields 7-11 are blank, enter `nc` to see two available facilities in the first testable trunk group.

   If a one-way trunk group or DF appears, the member B field is blank.

To Select a MPM or DF by Equipment Location

1. To see each port equipment type, choose from the following:

    Note that if you are testing a DF or a range, field 6 must contain a 1 before you enter the member A GPP equipment location. If you are testing a single circuit, field 6 may contain a 1 or a 2 before you enter the member A GPP equipment location or the member A data port equipment location.

    - To see the ADFTC or MTCP equipment location, enter `nd` until field 6 contains a 0.

        Fields 7-11 show the ADFTC or MTCP equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    - To see the member A GPP equipment location, enter nd until field 6 contains a 1.

        Fields 7-11 show the member A GPP equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    - To see the member A data port equipment location, enter nd until field 6 contains a 2.

        Fields 7-11 show the member A data port equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    - To see the member B GPP equipment location, enter `nd` until field 6 contains a 3.

        Fields 7-11 show the member B GPP equipment location.

        Field 13 shows the maintenance busy status of the member B (see Table 5-62).

    - To see the member B data port equipment location, enter nd until field 6 contains a 4.

        Fields 7-11 show the member B data port equipment location.

        Field 13 shows the maintenance busy status of the member B (see Table 5-62).

    If the equipment location in fields 7-11 is a DF, only the member A GPP port appears. If the equipment location in fields 7-11 is a one-way MPM, only the ADFTC or MTCP equipment location and member A equipment location appears.

2. If you want to test a specific member A GPP, choose from the following:

    - Enter `cf7` and enter the module, cabinet, carrier, slot, and circuit.

    - Enter `nc` until the equipment location you want to test appears.

    If you enter a partial equipment location in the equipment location fields, the first valid trunk group appears. If you do not enter data in all fields, special error codes 80 or 85 appear in the message line.

To Select the Test Length and Baud Rate

1. If you want to select the test length, enter `cf12` and then enter the test length (in minutes -up to four minutes for each test type).

    If the test fails the test stops after the default test length. The default test length is the time it takes to send one block of data at the highest administered baud rate. It may, however, take up to 15 seconds before your screen changes.

2. If you want to select a baud rate, enter `cf14` and enter the data rate encode in field 14.

    Table 5-55 shows the data fate encodes.

    The default data rate is the highest administered baud rate.

TABLE 5-55

Data Rate			
3 = 300		96 = 9600	
12 = 1200		192 = 19.2K	
24 = 2400		560 = 56K	
48 = 4800		640 = 64K	

3. If you selected a single circuit, go to *To Test a Circuit.*

4. If you selected a range of circuits, go to *To Test a Range of Circuits.*

To Busy Out a Port

1. Make sure that fields 7-11 show the equipment location of the circuit you want to busy out.

2. Enter `bo` to busy out the equipment location in fields 7-11.

    If field 13 contains a 5 you cannot busy out the circuit.

3. If you want to test a circuit, go to *To Test a Circuit.*

4. If you want to test a range, go to *To Test a Range of Circuits.*

5. If you want to test the ADFTC or MTCP, go to test 1.

6. If you want to do a diagnostic test on MPMs or DFs go to test 3.

To Release a Port from Busy

1. Make sure that fields 7-11 show the equipment location of the circuit you want to release from busy.

2. Enter bo to release the equipment location in fields 7-11 from busy.

3. If you want to test a circuit, go to *To Test a Circuit.*

4. If you want to test a range, go to *To Test a Range of Circuits.*

5. If you want to test the ADFTC or MTCP, go to test 1.

6. If you want to do a diagnostic test on MPMs or DFs, go to test 3.

To Test a Circuit

1. Make sure that you have selected the test type, the MPM or DFs to test, and optionally the ADFTC or MTCP, the test length, and the data rate.

2. Enter x to test the member A.

   WAIT appears on your screen.

   > Field 2 shows the test type (see Table 5-59). The number in field 2 changes as each test type is run.

   Several different tests may be run on one modem pooling circuit (or circuit pair). Some tests might fail while other tests pass. When a modem pooling circuit (or circuit pair) test fails, a specific fault code will appear. Bit error rate and the number of bits received and block error rate and the number of blocks received will appear for passing and, if possible, for failing tests.

   If the translation is not correct, special error code 85 appears. Select a valid equipment location and try again.

   If a facility is maintenance busied out, the switch releases it from busy while testing it. If the switch finds a facility in use, it logs a specific fault code in DMIDS and the test stops. The data call in progress continues.

   If you want to stop the test, before the circuit is completely tested, enter s

   If all test types are not done, special error code 95 appears. After the current test type completes, special error code 82 appears.

   > Field 2 shows the test type you selected (see Table 5-59).

   > Fields 3-11 show the port equipment location of the last facility tested.

   > Field 12 shows the number of failures.

   > Field 14 shows the number of circuits tested if all test types of a circuit are tested.

   You can enter x to continue the test or select a new range.

   The switch continues the test with the next test type. Test results are kept.

   When all test types have been run, WAIT disappears from your screen.

Field 2 shows the test type (see Table 5-59).

Fields 3-5 show the equipment location.

Field 6 shows the equipment type (see Table 5-61).

Fields 7-11 show the port equipment location of the MPM or DF.

Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

Field 13 contains a 4 (see Table 5-62).

Field 14 contains a 1.

3. Enter nc to see the specific fault code.

Field 14 shows the specific fault code. Record this number.

4. To see data for each test type for the circuit you selected, choose from the following:

- To see the bit error rate and the number of bits received, enter nf until field 13 contains a 2.

    Field 14 shows the bit error rate and the number of bits received. To interpret the bit error rate refer to Figure 5-23.
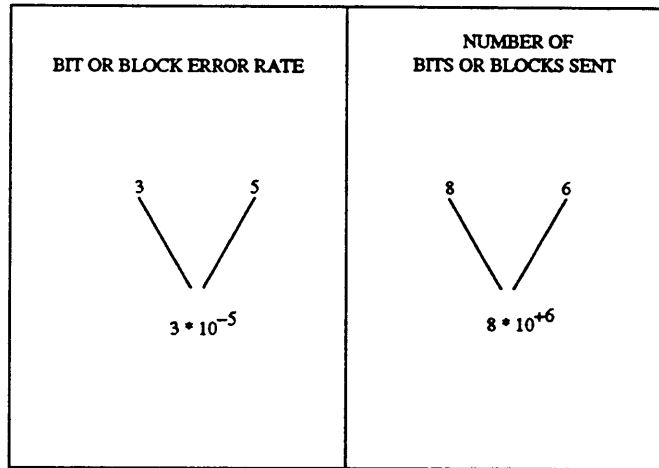
Figure 5-23. Bit and Block Rate Analysis

The test type increments for each set.

- To see the block error rate and the number of blocks received, enter nf until field 13 contains a 2.

    Field 14 shows the block error rate and the number of block received.
    error rate refer to Figure 5-23.

After you view the block error rate and the number of blocks received of the last test type you selected, the switch dashes all fields on your screen. If you enter nf again, field 13 contains a 1 and field 14 shows the specific fault code.

5.   To see each port equipment type, choose from the following:

- To see the ADFTC or MTCP equipment location, enter `nd` until field 6 contains a 0.

    Fields 7-11 show the ADFTC or MTCP equipment location.

- To see the member A GPP equipment location, enter `nd` until field 6 contains a 1.

    Fields 7-11 show the member A GPP equipment location.

- To see the member A data port equipment location, enter `nd` until field 6 contains a 2.

    Fields 7-11 show the member A data port equipment location.

- To see the member B GPP equipment location, enter `nd` until field 6 contains a 3.

    Fields 7-11 show the member B GPP equipment location.

- To see the member B data port equipment location, enter `nd` until field 6 contains a 4.

    Fields 7-11 show the member B data port equipment location.

If the equipment location in fields 7-11 is a DF, only the member A GPP port and ADFTC or MTCP equipment location appear. If fields 7-11 describes a one-way MPM, only the ADFTC or MTCP equipment location and member A GPP and data port equipment locations appear.

6.   If there are any failures, go to *DEFINITY™ Communications System Generic 2 Mainetenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 62 for MPM failures or unit type 35 for DF failures.

7.   If you want to test the ADFTC or MTCP, go to test 1.

8.   If you want to do a diagnostic test on MPMs or DFs go to test 3.

To Test a Range of Circuits

1. Enter x to test a range.

   WAIT appears on your screen.

   If you did not select a valid equipment location, special error code 93 appears in the message line.

   The following fields change as each facility is tested.

   > Field 2 shows the test type (see Table 5-59). If you selected test types 0-2, field 2 shows the test type as each test is done. If you are testing host access, field 2 does not change.

   > Field 3 shows the trunk group number of the MPM or DF being tested.

   > Field 4 shows the member A number of the current MPM or DF being tested.

   > Field 5 shows the member B number if a two-way MPM is being tested or is dashed.

   > Field 6 shows the equipment type (see Table 5-61). If a member A GPP is being tested, field 6 contains a 1.

   > Fields 7-11 show the port equipment location of the current MPM or DF being tested.

   > Field 13 contains a 2 (see Table 5-62).

   > Field 14 shows the bit error rate and number of bits received. The switch updates fields 13 and 14 every 10 seconds.

   The bit and block error rates, any specific fault code, and the port equipment locations are stored in DMIDS. If DMIDS becomes full at any time during the test, the test stops. Special error code 84 appears in the message line.

   If you want to stop the test before the range is completely tested, enter s

   WAIT disappears from your screen.

   > Field 2 shows the test type you selected (see Table 5-59).

   > Fields 3-11 show the circuit location and port equipment location of the last MPM or DF the switch tested.

   > Field 12 shows the number of circuits that failed.

   > Field 14 shows the number of circuits tested.
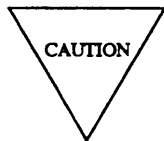
   $\triangledown$ **CAUTION**   If you continue test 2 again and it stopped because of a DMIDS overflow, any test results gathered to that point are lost and only new failure data is kept.

You can enter `nc` to examine test results, enter x to continue the test, or select a new range. If you continue the range, the test starts from where the test stopped.

When the range is completely tested, `WAIT` disappears from your screen.

> Field 2 shows the original test type you selected (see Table 5-59).

> Fields 3-11 show the port equipment location.

> Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

> Field 14 shows the number of circuit pairs tested.

2. Enter `nc` to see each circuit that was tested.

Failures with a specific fault code appear first. Passing circuits with a specific fault code of 0 appear next. Bit and block error rates appear for failing and for passing circuits. If you tested with more than one test type, specific fault codes, bit error rates, and block error rates appear for all test types.

> Field 2 shows the test type (see Table 5-59).

> Fields 3-5 show the trunk group number, the member A, and the member B (if applicable) of the facility.

> Field 6 shows the equipment type (see Table 5-61).

> Fields 7-11 show the equipment location of the facility.

> Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

> Field 13 contains a 1 (see Table 5-62).

> Field 14 shows the specific fault code.

3. If you want to see data for each test type you selected, choose from the following:

- To see the bit error rate and the number of bits received, enter `nf` until field 13 contains a 2.

> Field 14 shows the bit error rate and the bit received.

> To interpret the bit error rate refer to Figure 5-23.

- To see the block error rate and the number of blocks received, enter `nf`

> Field 14 shows the block error rate and the number of block received. To interpret the block error rate refer to Figure 5-23.

After you view the block error rate and number of blocks received of the last test type you selected for the circuit tested, the switch dashes all fields on your screen. If you enter `nf` again field 13 contains a 1 and field 14 shows the specific fault code.

4. To see each port equipment type, choose from the following:

    - Enter nd until field 6 contains a 0.

        Fields 7-11 show the ADFTC or MTCP equipment location.

    - Enter nd until field 6 contains a 1.

        Fields 7-11 show the member A GPP equipment location.

    - Enter nd until field 6 contains a 2.

        Fields 7-11 show the member A data port equipment location.

    - Enter nd until field 6 contains a 3.

        Fields 7-11 show the member B GPP equipment location.

    - Enter nd until field 6 contains a 4.

        Fields 7-11 show the member B data port equipment location.

    If the equipment location in fields 7-11 is a DF, only the member A GPP port and the ADFTC or MTCP equipment location appear. If fields 7-11 describe a one-way MPM, only the ADFTC or MTCP equipment location and member A GPP and data port equipment locations appear.

5. If you want to see the first tested circuit in the next trunk group, enter nu and then enter nc to see each tested circuit.

6. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 62 for MPM failures or unit type 35 for DF failures.

    After you repair all MPM or DF failures, the switch turns off the **OTHER FAILS** fault indicator on the common-control alarm panel if there is no other reason for it to be on. The switch marks all MPM or DF alarms resolved.

7. If this is not the last circuit that was tested, repeat steps 2-7.

8. If you want to test another MPM, DF, member A GPP, or member A data port to test, go to *To Select a Range of Circuits.*

9. If you want to test the ADFTC or MTCP, go to test 1.

10. If you want to do a diagnostic test on MPMs or DFs go to test 3.

Test 3 - Operation

Use test 3 to do a diagnostic test on MPMs or DFs.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter p646

   - If you are already in the procedure but not in test 3, enter ts

     The test 3 screen, similar to the following, appears.

```
        ENHANCED MODE - PROCEDURE: 646, TEST: 3
     DO A DIAGNOSTIC TEST ON MODEM POOL MEMBERS AND DIGITAL FACILITIES


  2. Test Type: ▢
CIRCUIT LOCATION
     3. Trunk Group Number: ▢
     4.          Member A: ▢
     5.          Member B: ▢
EQUIPMENT LOCATION
     6. Equipment Type: ▢
     7.          Module: ▢
     8.         Cabinet: ▢
     9.         Carrier: ▢
    10.           Slot : ▢
    11.         Circuit : ▢
 12. Test Minutes or Failures: ▢
TEST DATA
    13. Data Type: ▢
    14.     Data: ▢



Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][ F3 DATA ][_____][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

The switch highlights field 2.

Fields 3-11 may show the default trunk number and equipment location of the default trunk from test 2 or from Procedure 600 Test 1 or 2, or from Procedure 620 (if the equipment location is a GPP or data port which is part of an MPM or digital facility). Record the default equipment location. If you select an ADFTC or MTCP you will have to enter the default equipment again.

Field 13 may show the maintenance busy status of the default circuit (see Table 5-62).

Field 14 may show the specific fault code of the default circuit.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select Test Parameters

You must select a test type and an MPM or DF to test. You may select an ADFTC or MTCP to use for testing, a circuit or a range to test, the test length, or the baud rate.

To Select a Test Type and a MPM and DF

1. To select a test type, enter `cf2` and enter the test type in field 2 (see Table 5-60).

   You cannot use each test type for all types of MPMs or digital facilities. For DFs the translation information determines the loopback positions. Check the translation in Procedure 100 Word 2 to find the point of loopback. Procedure 100 Word 2 can also disable the DF testing of a particular modem pooling trunk group.

   Table 5-56 shows the MPM test 3 constraints.

TABLE 5-56

Test 3 Constraints	
Test Type	**Constraint**
0	Any MPM or DF being tested.
1	Any MPM or DF with local and remote loop back control translated.
2	Any MPM or DF.
3	Any MPM or DF with local loop back control or local and remote loop back control translated.
4	Any MPM or DF with local and remote loop back control translated.
5	Any MPM with local and remote loop back control translated.

2. If you want to select an ADFTC or MTCP, enter cf6 0 and enter the module, cabinet, carrier and slot of the ADFTC or MTCP you want to use for testing.

   If you do not select an ADFTC or MTCP the switch selects the first idle ADFTC or MTCP.

To Select MPMs or Digital Facilities by Trunk Group, Member A, or Member B

   If you want to select a member A or member B in a trunk group select the trunk group and then select the member A or member B.

1. To select a trunk group choose from the following:

   • Enter cf3 and enter the trunk group in field 3.

   • If you do not know the trunk group number, enter nu until the trunk group you want to test appears.

   The switch tests all members of the trunk group (if you do not select a member A).

2. If you want to select a member A, enter cf4 and enter the member A.

   If you are testing a one-way MPM or DF do not select a member B. P If you want to test a specific member A with a specific member B, enter the member A and the member B.

   You can enter nc to step through the member As.

   Field 6 shows the equipment type (see Table 5-61). Since you are viewing member As field 6 contains a 1.

   Fields 7-11 show the member A GPP equipment location.

   Field 13 shows the maintenance busy status of the member A (see Table 5-62).

3. To select a member B, enter cf5 and the member B number.

    If you want to test a DF or a MPG with one way modems, the member B field must be blank.

4. If fields 3-5 and fields 7-11 are blank, enter nc to see two available facilities in the first testable trunk group.

    If a one-way trunk group or DF appears, the member B field is blank.

To Select a MPM or DF by Equipment Location

1. To see each port equipment type, choose from the following:

    If you are testing a DF or a range field 6 must contain a 1 before you enter the member A GPP equipment location. If you are testing a single circuit field 6 may contain a 1 or a 2 before you enter the member A GPP equipment location or the member A port equipment location.

    - To see the ADFTC or MTCP equipment location, enter nd until field 6 contains a 0.

        Fields 7-11 show the ADFTC or MTCP equipment location.

    - To see the member A GPP equipment location, enter nd until field 6 contains a 1.

        Fields 7-11 show the member A GPP equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    - To see the member A data port equipment location, enter nd until field 6 contains a 2.

        Fields 7-11 show the member A data port equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    - To see the member B GPP equipment location, enter nd until field 6 contains a 3.

        Fields 7-11 show the member B GPP equipment location.

        Field 13 shows the maintenance busy status of the member B (see Table 5-62).

    - To see the member B data port equipment location, enter nd until field 6 contains a 4.

        Fields 7-11 show the member B data port equipment location.

        Field 13 shows the maintenance busy status of the member A (see Table 5-62).

    If the equipment location in fields 7-11 is a DF only the member A GPP port appears. If the equipment location in fields 7-11 is a one-way MPM only the ADFTC or MTCP equipment location and member A equipment location appears.

2. To test a specific member A GPP choose from the following:
    - Enter cf7 and enter the module, carrier, slot, and circuit.
    - Enter nc until the equipment location you want to test appears.

To Select the Test Length and Baud Rate

1. If you want to select the test length, enter `cf12` and then enter the test length (in minutes and up to four minutes for each test type).

   If the test fails the test stops after the default test length. The default test length is the time it takes to send one block of data at the highest administered baud rate. It may, however, take up to 15 seconds to see a change on MANAGER II.

2. If you want to select a baud rate `cf14` and enter the data rate encode in field 14.

   Table 5-57 shows the data rate encodes.

   The default data rate is the highest administered baud rate.

TABLE 5-57

Data Rate			
3	= 300	9	= 9600
12	= 1200	192	= 19.2K
24	= 2400	560	= 56K
48	= 4800	640	= 64K

3. Go to *To Do a Diagnostic Test.*

To Busy Out a Port

1. Make sure that fields 7-11 show the equipment location of the circuit you want to busy out.

2. Enter `bo` to busy out the equipment location in fields 7-11.

   If field 13 contains a 5 you cannot busy out the circuit.

3. If you want to test a circuit, go to *To Test a Circuit.*

4. If you want to test a range, go to *To Test a Range of Circuits.*

5. If you want to test the ADFTC or MTCP, go to test 1.

6. If you want to do a detection test on MPMs or DFs go to test 2.

To Release a Port from Busy

1. Make sure that fields 7-11 show the equipment location of the circuit you want to release from busy.

2. Enter bo to release the equipment location in fields 7-11 from busy.

3. If you want to test a circuit, go to *To Test a Circuit.*

4. If you want to test a range, go to *To Test a Range of Circuits.*

5. If you want to test the ADFTC or MTCP, go to test 1.

6. If you want to do a detection test on MPMs or DFs, go to test 2.

To Do a Diagnostic Test

1. Make sure that you have selected the test type, the MPM or DFs to test, and optionally the ADFTC or MTCP, the test length, and the data rate.

2. Enter x to do a diagnostic test.

   Several different tests may be run on one modem pooling circuit (or circuit pair). Some tests might fail while other tests pass. When a modem pooling circuit (or circuit pair) test fails a specific fault code will appear. Bit error rate and the number of bits received and block error rate and the number of blocks received, will appear for passing and failing tests.

   If the translation is not correct, special error code 85 appears. Select a valid equipment location and try again.

   If the switch finds a facility or a member B that is maintenance busy, it logs a unique specific fault code for the busy facility or the member B. If the switch finds a facility in use, it logs a specific fault code in DMIDS and the test stops. The data call in progress continues.

   WAIT appears on your screen.

      Field 2 shows the test type (see Table 5-60).

      Field 13 contains a 2 (see Table 5-62).

      Field 14 shows the bit error rate and number of bits received (see Figure 5-24).

   The data in fields 13 and 14 is updated every 10 seconds.

If you want to stop the test before the circuit is completely tested, enter s

If you stop the test before all test types are done, special error code 95 appear. After the current test type completes, special error code 82 appears.

Field 2 shows the test type you selected (see Table 5-60).

Fields 3-11 show the port equipment location of the last facility tested.

Field 12 shows the number of failures.

Field 14 shows the number of circuits tested if all test types of a circuit are tested.

You can enter x to continue the test or select anew range. Test results are kept.

When all test types have been run, WAIT disappears from your screen.

Field 2 shows the test type (see Table 5-60).

Fields 3-5 show the equipment location.

Field 6 shows the equipment type (see Table 5-61).

Fields 7-11 show the port equipment location of the MPM or DF.

Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

Field 13 shows the data type and contains a 4 (see Table 5-62).

Field 14 shows the number of ports tested and contains a 1.

3. Enter nc to seethe test results.

Field 14 shows a specific fault code. Record this number.

4. To see data for each test type for the circuit you selected, choose from the following:

- To see the bit error rate and the number of bits received, enter nf until field 13 contains a 2.

  Field 14 shows the bit error rate and the number of bits received. To interpret the bit error rate refer to Figure 5-24.

- To see the block error and the number of blocks received, enter nf until field 13 contains a 3.

  Field 14 shows the block error rate and the number of block received. To interpret the block error rate refer to Figure 5-24.

After you view the block error rate and the number of blocks received of the last test type you selected, the switch dashes all fields on your screen. If you enter nf again, field 13 contains a 1 and field 14 shows the specific fault code.
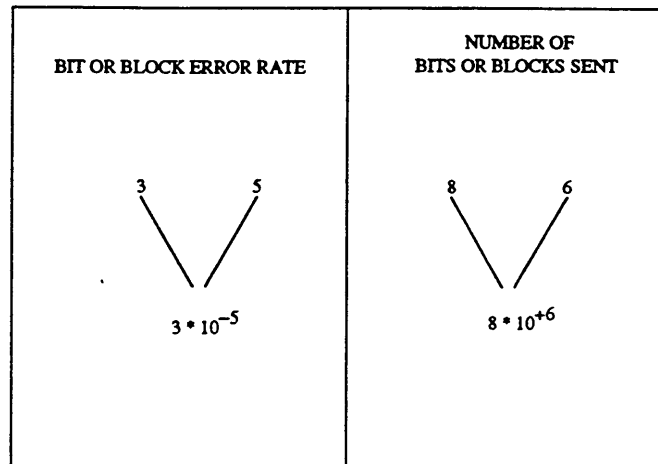
Figure 5-24. Bit and Block Rate Analysis

5. To see each port equipment type choose from the following:

  - To see the ADFTC or MTCP equipment location, enter nd until field 6 contains a 0.

    Fields 7-11 show the ADFTC or MTCP equipment location.

  - To see the member A GPP equipment location, enter nd until field 6 contains a 1.

    Fields 7-11 show the member A GPP equipment location.

  - To see the member A data port equipment location, enter nd until field 6 contains a 2.

    Fields 7-11 show the member A data port equipment location.

  - To see the member B GPP equipment location, enter nd until field 6 contains a 3.

    Fields 7-11 show the member B GPP equipment location.

  - To see the member B data port equipment location, enter nd until field 6 contains a 4.

    Fields 7-11 show the member B data port equipment location.

  If the equipment location in fields 7-11 is a DF, only the member A GPP port appears. If the equipment location in fields 7-11 is a one-way MPM only the ADFTC or MTCP equipment location and member A equipment location appears.

6. If there are any ADFTC or MTCP failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 62 for MPM failures or unit type 35 for DF failures.

7. If you want to test the ADFTC or MTCP, go to test 1.

8. If you want to do a detection test on a MPM or DF, go to test 2.

Special Error Codes

While using Procedure 646 you may see the following special error codes:

- `80=Equipment location is not complete.`

    You entered part of the equipment location. Enter the full equipment location and try again.

- `81=The message transmission to the module processor failed.`

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=The test is not complete.`

    You entered s to stop the test before all test types were done, or DMIDs overflowed. The test stops automatically. Enter x to continue testing or select a new equipment location.

- `83=There is no ADFTC or MTCP available for test.`

    There is no ADFTC or MTCP available. This usually means that no ADFTCs or MTCPs are administered or they are all busied out. Check the maintenance busy status for the ADFTC or MTCP. They may, however, be busy on a call. In this case, wait and try again.

- `84=DMIDs overflowed before the test was complete.`

    There are too many failures. If field 13 contains a 99, there are 99 or more failures. Enter nc to examine each failure, enter x to continue the test, or select a new circuit.

- `85=Invalid equipment location.`

    You did not complete the equipment location for an ADFTC or MTCP, or when the circuit is not translated correctly. Enter the correct equipment location or check translation.

- `86=Invalid test type.`

- `87=Invalid circuit fields.`

- `88=Invalid member.`

- `89=No member available.`

- `90=Invalid data rate.`

- `91=Wrong equipment location type.`

- `92=Invalid test type for trunk group mode.`

- `93=No circuit found in range.`

- `94=Member B invalid for digital facilities.`

- `95=Wait for test to stop.`

    You stopped the test before all test types were done or before all circuits were tested. The test will stop after the current test type finishes for the circuit on your screen.

- `96=You must enter an equipment location in fields 7-11 before you
  enter bo or rb.`

- `97=Procedure 100 has disabled digital facility testing for this trunk
  group.`

TABLE 5-58

Test 1 Field 2 Test Types		
0	=	All ADFTC self tests
1	=	One port ADFTC self test
2	=	Two port normal ADFTC self test
3	=	Two port reverse ADFTC self test

TABLE 5-59

Test 2 Field 2 Test Types		
0	=	All tests or host access
1	=	All originating tests
2	=	All terminating tests
3	=	Two-port originating, normal test
4	=	Two-port originating, reverse test
5	=	Two-port terminating, normal test
6	=	Two-port terminating, reverse test
7	=	One-port originating test
8	=	One-port terminating test

TABLE 5-60

Test 3 Field 2 Test Types		
0	=	All tests
1	=	All EIA remote loop-back tests
2	=	Data module remote loop-back tests
3	=	All EIA local loop-back tests
4	=	EIA remote loop-back originating tests
5	=	EIA remote loop-back terminating tests

TABLE 5-61

Field 6 Equipment Type		
0	=	ADFTC
1	=	Member A GPP
2	=	Member A data port
3	=	Member B GPP
4	=	Member B data port

Procedure Fields

The fields listed below are data entry fields:

- In all tests, you can select the test type in field 2.

- In tests 2 and 3, you can select an ADFTC or MTCP equipment location in fields 7-11.

- In tests 2 and 3, you can select a MPM or DF in fields 7-11

- In tests 2 and 3 you can select a trunk group in field 3.

- In tests 2 and 3 you can select a member A and member B in fields 4 and 5. 7-11.

- In test 2 and test 3 you can select the test length in field 12.

- In test 2 and test 3 you can select a data rate in field 14.

The meaning of the fields are:

2.	Test Type	Shows the type of tests that are run. Each test can do different types of test. Table 5-58 shows the test 1 test types. Table 5-59 shows the test 2 test types. Table 5-60 shows the test 3 test types.
3-5.	CIRCUIT LOCATION	Shows the trunk group number and the member A or member B.
6-11	EQUIPMENT LOCATION	Field 6 shows the equipment type. Table 5-61 shows the equipment type encodes.
		Fields 7-11 show the equipment location of the ADFTC or MTCP, MPM, or DF circuit (depending on the equipment type in field 6).
12.	Test Minutes or Failures	You can select the test length before you start the test (in minutes, up to four minutes). After the test, field 12 shows the number of failures.
13.	Data Type	Shows the type of data in field 14.

TABLE 5-62

Field 13 Data Type		
1	=	Specific fault code in field 14
2	=	Bit error rate and number of bits received in field 14
3	=	Block error rate and number of blocks received in field 14
4	=	Number of circuits tested in field 14
5	=	Resource maintenance busy
6	=	Resource not maintenance busy

TABLE 5-63

Modem Characteristics						
Modem	**Duplex**	**Sync/ Async**	**Speed (bps)**	**Answer Mode**	**Originate Mode**	**Test Type**
103JR	full	async	low	yes	yes	0-8
113C	full	async	low, 300	yes	yes	0-6
113D	full	async	low, 300	no	yes	0-6
212AR	full	async	low, 1200	yes	yes	0-8
212AR	full	sync	1200	yes	yes	0-8
20lCR	half	sync	2400	yes	yes	0-8
208BR	half	sync	4800	yes	yes	0-8
2224A	full	async	low, 1200,2400	yes	yes	0-8
2224A	full	sync	1200,2400	yes	yes	0-8

14.   Data   You can select the baud rate before you start the test (see Table 5-57). Field 14 shows the data after you run the test.

If field 13 contains a 1, field 14 shows the specific fault code. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.

If field 13 contains a 2, the first two digits in field 14 are the bit error rate and the second two digits in field 14 are the number of bits received (see figure 5-24). If field 13 contains a 3, the first two digits in field 14 are the block error rate and the second two digits in field 14 are the number of blocks received.

If field 14 contains a 0, no bits or blocks were received. If the first two digits are blank, the error rate is 0.

To get the bit or block error rate, multiply the first (leftmost) digit by 10 raised to the negative power of the second digit. To get the number of bits or blocks received, multiply the third digit by 10 raised to the positive power of the fourth digit.

If field 13 contains a 4, field 14 shows the number of circuits tested.

PROCEDURE 647 - ATMS TESTS

Purpose

Use Procedure 647 to examine the automatic transmission measurement system (ATMS) trunk failure history log, to resolve alarms, to measure transmissions of a circuit or a range of circuits, to check the supervision capabilities of a circuit or a range of circuits, to do transmission tests between near-end and far-end facilities and measure loss, noise, and echo impairments when you suspect intermittent problems with analog trunks.

Tests

Procedure 647 has three tests.

- Use test 1 to examine the ATMS failure history log and to resolve alarms.
- Use test 2 to test a circuit and compare the transmission measurements to administered thresholds.
- Use test 3 to test be the signaling capabilities of a single circuit or a range of circuits.

Procedure Overview

Use Procedure 647 to test the transmission quality of a trunk by calling another switch that has a terminating test line (TTL).

A test call goes through the following states.

- The local switch sets up a normal call on the trunk you selected.
- The local switch sends test data, and receives test data from the second switch.
- The local switch terminates the test call when the test is complete.
- The local switch reports the measurement results through Procedure 647.

To use the ATMS feature you must have an ADFTC or MTCP at the originating switch, the feature must be translated (with Procedure 107 Word 1), and the switch you want to call must have a TTL (see Figure 5-25).
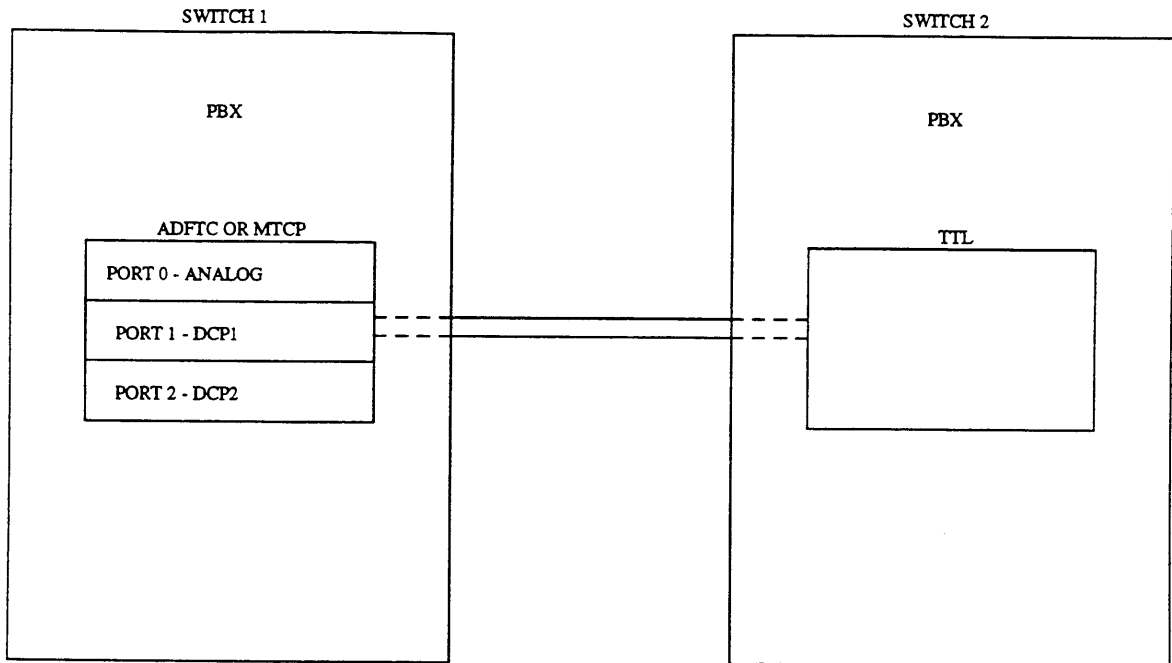
Figure 5-25.   ATMS Test Call

Use test 1 to find trunk failures detected during ATMS scheduled tests. Up to 60 failures can appear.

A circuit, in Procedure 647, is an ATMS trunk circuit that can access a TTL.

The TTL information must be translated for the trunk group or tests 2 and 3 will not execute.

Test 1 - Operation

Use test 1 to examine the ATMS failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure but not in test 1, enter `t1`

   ● Otherwise, enter `p647`

   The test 1 screen, similar to the following, appears.

```
                  ENHANCED MODE - PROCEDURE: 647, TEST: 1
                      EXAMINE THE ATMS FAILURE HISTORY LOG

  2.   Trunk Group: ▢
  3. Trunk Number: ▢
 11.      TTL Type: ▢
 15.    Trunk Type: ▢


EQUIPMENT LOCATION                        FAILURE DATA
    4.   Module: ▢                13. PMIDS Failure Index: ▢
    5. Cabinet: ▢                 14.   Number of Failures: ▢
    6. Carrier: ▢
    7.    Slot: ▢
    8. Circuit: ▢

  9. Circuit Status: ▢
 10.  Alarm Status: ▢

 12. Fault  Code: ▢



Connected to CC0 ON-LINE ♡ ⎸ MAJOR ⎹⎸ MINOR ⎹⎸ RUN TAPE ⎹⎸ BUSY OUT ⎹⎸ IN USE ⎹⎸ WAIT ⎹

enter command: ▭
⎸_____⎹⎸_____⎹⎸F3 DATA⎹⎸_____⎹⎸F5 HELP⎹⎸F6 FIELD⎹⎸F7 INPUT⎹⎸F8 CMDS⎹
```

   The switch highlights field 2.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the ATMS Failure History Log

1. Enter x to sort the ATMS failure history log.

   The switch sorts the ATMS failure history log by alarm severity.

      Field 14 shows the total number of failures. If there are no failures, field 14 contains a 0.

2. Enter nc to see each failure.

      Field 2 shows the trunk group.

      Field 3 shows which trunk you are viewing in the trunk group.

      Field 11 shows the TTL type (see Table 5-68).

      Field 15 shows the trunk type.

      Fields 4-8 show the equipment location.

      Field 9 shows the circuit status (see Table 5-65).

      Field 10 shows the alarm status (see Table 5-66).

      Field 12 shows the most severe fault code (see Table 5-69).

      Field 13 shows which failure you are currently viewing. The number in field 13 decreases by one as you view each failure.

      Field 14 shows the number of failures.

3. Go to test *2* and test the circuit that failed.

4. If this is not the last failure repeat steps 1-4.

   After you view all failures, the switch dashes all fields. If you enter nc again, field 14 shows the total number of failures.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to test a circuit and compare transmission measurements to administered thresholds, go to test 2.

7. If you want to test the supervision capabilities of a single circuit or a range of circuits and all trunks with translations that can access an ATMS terminating test line, go to test 3.

To Resolve Alarms

You may want to resolve any invalid alarms from the ATMS failure history log.

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nc until the alarm you want to clear appears.
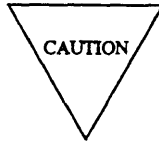
    Record all alarms before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting. **[CAUTION]**

2. Enter cdx to resolve alarms.

    If you resolved a single alarm, field 10 contains a 5.

    If you resolved a single alarm, field 14 shows the number of alarms still in the ATMS failure history log. If you resolved all alarms and if there are no errors field 14 contains a 0.

    The switch marks the ATMS alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.   MINOR disappears from your screen if there is no other reason for it to be there.

3. If you want to test a circuit and compare transmission measurements to administered thresholds, go to test 2.

4. If you want to test the signaling capabilities of a single circuit and all trunks with translations that can access an ATMS TTL, go to test 3.

Test 2 - Operation

Use test 2 to test one or more circuits and to compare transmission measurements to administered thresholds.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    ● To start the procedure, enter p647

    ● If you are already in the procedure but not in test 2, enter t2

    The test 2 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 647, TEST: 2
              MEASURE  TRUNK  TRANSMISSION  CHARACTERISTICS

 2.   Trunk Group : ☐
 3.  Trunk Number: ☐
11.     TTL Type: ☐


EQUIPMENT LOCATION                  TEST OR MEASUREMENT RESULTS
    4.   Module: ☐                  13.     No. Tested I Index I Result: ☐
    5. Cabinet: ☐                   14.     No. Failed I Circuits I Result: ☐
    6. Carrier: ☐                   15.     Trunk Type I None I Result: ☐
    7.    Slot: ☐
    8. Circuit: ☐


STATUS
   9. Circuit Status: ☐
  10.    Test State: ☐


FAILURE  INFORMATION
  12.    Fault Code: ☐


Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[        ][        ][F3 DATA ][        ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

The switch highlights field 12.

Fields 2-8 may show a default trunk group, trunk number, and equipment location from test 1 or test 3, Procedure 600 test 1 or 2, or Procedure 620 if the equipment location is a central office (CO) trunk or tie trunk.

Field 9 shows the circuit status for the default circuit (see Table 5-65).

Field 11 shows the TTL type for the default circuit (see Table 5-68).

Field 15 shows the trunk type of the default circuit.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Circuit or a Range of Circuits

1. If you want to test all circuits in the switch, enter `cf2` and then enter ; to blank field 2.

   If you just blank field 2, all equipment location fields will be blank.

2. If you want to select all trunks in a trunk group, enter `cf2` and then enter the trunk group.

   Note that it may take a long time to test all trunks in a trunk group.

   > Field 11 shows the TTL type (see Table 5-68).

   > Field 15 shows the trunk type.

3. If you want to select a specific trunk by trunk group, choose from the following:

   - Enter `cf2` and enter the trunk group and the trunk number.
   - Enter nu until the trunk group you want to test appears and then enter nc until the trunk you want to test appears.

     > Fields 4-8 show the equipment location.

     > Field 9 shows the circuit status (see Table 5-65).

     > Field 11 shows the TTL type (see Table 5-68).

     > Field 15 shows the trunk type.

4. If you want to select a specific circuit, enter `cf4` and enter the module, cabinet, carrier, slot, and circuit.

   > Fields 2 and 3 show the trunk group and trunk number.

   > Field 9 shows the circuit status (see Table 5-65).

   > Field 11 shows the TTL type (see Table 5-68).

   > Field 15 shows the trunk type.

5. Go to *To Test a Circuit or a Range of Circuits.*

To Test a Circuit or a Range of Circuits

1. Make sure that you have selected a circuit or a range of circuits to test.

2. Enter x to test the circuit or range you selected.

   WAIT appears on your screen.

   If you selected a range, the following fields change as each trunk group in the trunk or circuit in the switch is tested.

   Fields 2 and 3 show the trunk group and trunk number.

   Fields 4-8 show the equipment location.

   Field 9 shows the circuit status (see Table 5-65).

   Field 10 shows the test state (see Table 5-67). The number in field 10 increases by one as the test progresses.

   Field 11 shows the TTL type (see Table 5-68).

   Field 13 shows the number of circuits tested. The number in this field increases by one as each circuit is tested.

   Field 14 shows the number of circuits with failures.

   Field 15 shows the trunk type.

   The test continues until DMIDS fills up, until you enter s, or until the switch tests the range you selected. If DMIDS fills up, the test stops and special error code 83 appears.

   Fields 2-8 show the original range you selected.

   Field 13 shows the number circuits tested.

   Field 14 shows the number of failures for the circuit. If a 99 appears, there are 99 or more failures.

CAUTION
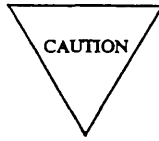
Examine and record all failure data before you start test 2 again. When you start the test again, any test results gathered are lost. New failure data overwrites old data

You can enter `nc` to examine failure information, enter x to continue the test, or select a new range.

If you want to stop the test before the switch tests the circuit or range, enter s

Special error code 82 appears on your screen.

> Fields 2-8 show the original circuit or range you selected.

> Field 10 shows the test state and contains a 9 (see Table 5-67).

> Field 13 shows the number of circuits tested.

> Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

After the switch tests the range, `WAIT` disappears from your screen.

> Fields 2-8 show the original circuit or range you selected.

> Field 10 shows the test state and contains a 9 (see Table 5-67).

> Field 13 shows the number of circuits tested.

> Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

3. Enter `nc` to see each circuit that was tested.

Failing circuits appear first, followed by passing circuits.

> Fields 2 and 3 show the trunk group and trunk number.

> Fields 4-8 show the equipment location.

> Field 9 shows the circuit status (see Table 5-65).

> Field 10 shows the test state (see Table 5-67). If field 10 contains encodes 2-4, no further information, including measurement data, is available.

> Field 11 shows the TTL type (see Table 5-68).

> Field 12 shows the fault code (see Table 5-69). Record this number.

> Field 13 shows which failure you are viewing (the failure index). As you view each failure the number in field 13 decreases by one.

> Field 14 shows the number of failures. If there are no failures, field 14 contains a 0.

> Field 15 shows the trunk type.

4. If field 13 contains a number greater than one, enter `nf` to see other fault codes.

Field 9 contains a `1` if the circuit is still in use (see Table 5-65).

Field 10 shows the test state (see Table 5-67). If field 10 contains a 5 or 6, the test completed and the measurement was acceptable. If field 10 contains a 3 the circuit was in-use during the test. Record each circuit that is in-use if you want to try and test it again.

Field 12 shows the fault code (see Table 5-69). Record all fault codes. If field 12 contains a 5, record all in-use circuits so you can test them later.

Field 13 shows the fault code index. The number in field 13 decreases by one as you view each fault code.

Field 14 shows the number of failures for the circuit-

To see the measurement data for the fault code on your screen, interpret the tens digit as the measurement set number and the ones digit as the field number (fields 13-15) that contains the measurement data. If, for example, field 12 contains a 52, you should enter `nd` until field 12 contains a 50 and look at the second set of measurement results (field 14).

5. If this is not the last fault code repeat steps 4 and 5.

After you view all fault codes, the switch dashes fields 12-14. If you enter `nf` again, the summary appears.

6. Enter `nd` to see the measurement results.

Measurement results give further diagnostic information, so you can find if the passing circuits are within marginal thresholds or if the thresholds need to be adjusted.

The switch may log up to 18 measurements for each circuit. There are six sets of three measurements.

Field 12 shows which of the six measurement set you are viewing (see Table 5-64). The number in field 12 increases from 10 to 60 by tens.

Fields 13-15 show three measurement results (see Table 5-64). Numbers 91-99 appear for negative numbers 1-9. If fields 13-15 are dashed, the measurement does not apply for the terminating test line.

The fault code numbers show the thresholds that were exceeded for the measurement set. For example if field 12 contains a 10, measurements corresponding to fault codes 11-13 appear in fields 13 through 15. If field 12 contains a 20, measurements corresponding to fault codes 21-23 appear in fields 13-15.

TABLE 5-64

Measurement Results		
Field 12 Measurement Index	**Field Number**	**Definition of Measurement Values in Fields 13-15**
10	13	Far to near end 404-Hz loss measurement
	14	Far to near end 1004-dBm loss measurement
	15	Far to near end 2804-HZ loss measurement
20	13	Near to far end 404-Hz loss measurement
	14	Near to far end 1004-dBm loss measurement
	15	Near to far end 2804-Hz loss measurement
30	13	Far to near end 1004-Hz loss measurement
	14	Near to far end 1004-Hz loss measurement
	15	Near end C-message noise without tone measurement
40	13	Far end C-message noise without tone measurement
	14	Near end C-message noise with tone measurement
	15	Far end C-message noise with tone measurement
50	13	Low-frequency near end singing return loss measurement
	14	Near end echo return loss measurement
	15	High-frequency near end singing return loss measurement
60	13	Low-frequency far end singing return loss measurement
	14	Far end echo return loss measurement
	15	High-frequency far end singing return loss measurement

After you view all measurement sets, (field 12 contains a 60) the switch dashes fields 12-15. If you enter nd again, the first set of measurements appears.
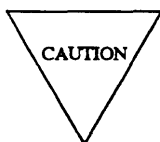
CAUTION
If you enter nu all data stored in DMIDS is lost. The first trunk in the next trunk group appears. Do not enter nu while you are looking at test results unless you are finished testing a trunk group.

If circuits were in use during the test, enter nc to see each circuit that was in-use. Record each in-use circuit.
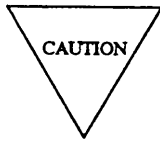
▽ **CAUTION**   Examine and record all failure history information before you try to retest circuits that were in-use. All prior test results are erased when you enter x.

Enter x to test the in-use circuit.

If the circuit is still in use, the switch waits until the circuit is not in use.

Field 10 contains a 3, until the circuit becomes available (see Table 5-67).

If you want to test other circuits that were in-use when you first ran the test, go to *To Select a Circuit* and enter each equipment location.

7. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 70.

8. If this is not the last circuit that was tested, repeat steps 3-8.

    After you view all circuits that were tested, the switch dashes all fields. If you enter nc again, the summary appears.

9. If you want to examine the ATMS failure history log or resolve alarms, go to test 1.

10. If you want to check the supervision capabilities of a single circuit or a range of circuits and all trunks with translations that can access an ATMS terminating test line, go to test 3.

To Busy Out a Circuit

1. Make sure that you have selected a circuit,

    If you have not selected a circuit, go to *To Select a Circuit or a Range of Circuits.*

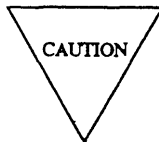   If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.
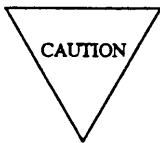
▽ **CAUTION**   If you busy out a trunk that is in use, you drop customer calls on the trunk.

2. Enter bo to busy out a circuit.

3. If you want to examine the ATMS failure history log and to resolve alarms, go to test 1.

4. If you want to test the signaling capabilities of a single circuit and all trunks with translations that can access an ATMS TTL, go to test 3.

To Release a Circuit from Busy

1. Make sure that you have selected a circuit to release from busy.

   If you have not selected a circuit, go to *To Select a Circuit or a Range of Circuits.*

2. Enter rb to release the circuit from busy.

   If you want to release an ISDN trunk the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end, you cannot release the trunk and the trunk will be in limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

3. If you want to examine the ATMS failure history log or resolve alarms, go to test 1.

4. If you want to test the supervision capabilities of a single circuit or a range of circuits and all trunks with translations that can access an ATMS terminating test line, go to test 3.

Test 3 - Operation

Use test 3 to test the signaling capabilities of one or more circuits by sensing the test progress tone or the 1004 Hz tone from the TTL.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    ● To start the procedure, enter p647

    ● If you are already in the procedure but not in test 3, enter t3

       The test 3 screen, similar to the following, appears.

```
           ENHANCED MODE  -  PROCEDURE: 647, TEST: 3
                    SUPERVISE   TRUNK  TRANSMISSION

 2.   Trunk Group: ▢
 3.  Trunk Number: ▢
11.      TTL Type: ▢
15.    Trunk Type: ▢


EQUIPMENT LOCATION                        FAILURE  DATA
   4.   Module: ▢                  13.      No. Tested IIndex: ▢
   5. Cabinet: ▢                   14. No. Failures ICircuits: ▢
   6. Carrier: ▢
   7.    Slot : ▢
   8. Circuit: ▢

 9. Circuit Status: ▢
10.      Test State: ▢

12.    Fault Code: ▢



Connected to CC0 ON-LINE ♡  MAJOR   MINOR   RUN TAPE   BUSY OUT   IN USE   WAIT

enter command: ▬
         F3 DATA        F5 HELP  F6 FIELD F7 INPUT F8 CMDS
```

Fields 2-8 may show a default trunk group, trunk number, and equipment location from test 1 or test 2, Procedure 600 Test 1 or 2, or Procedure 620 (if the equipment location is a CO trunk or tie trunk equipment location).

Field 9 shows the default circuit status (see Table 5-65).

Field 11 shows the default TTL type (see Table 5-68).

Field 15 shows the default trunk type.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Select a Circuit or a Range of Circuits

1. If you want to test all circuits in the switch, enter `cf2` and then enter ; to blank field 2.

    If you just blank field 2, all fields are blank.

2. To select all trunks in a trunk group, enter `cf2` and then enter the trunk group number.

    Field 11 shows the TTL type (see Table 5-68).

    Field 15 shows the trunk type.

3. To select a specific trunk by trunk group and trunk number, enter `cf2` and enter the trunk group and the trunk number.

4. Enter `nu` to see the first trunk in the next testable trunk group then enter `nc` until the trunk you want to test appears.

    Fields 4-8 show the equipment location.

    Field 9 shows the circuit status (see Table 5-65).

    Field 11 shows the TTL type (see Table 5-68).

    Field 15 shows the trunk type.

5. To select a specific circuit, enter `cf4` and enter the module, cabinet, carrier, slot, and circuit.

    Fields 2 and 3 show the trunk group and trunk number.

    Field 9 shows the circuit status of the trunk (see Table 5-65).

    Field 11 shows the TTL type (see Table 5-68).

    Field 15 shows the trunk type.

6. Go to *To Test a Circuit.*

To Test a Circuit

1. Make sure that you have selected a circuit to test.

2. Enter x to test a circuit.

   WAIT appears on your screen.

   The switch tests the first trunk in the first trunk group, and tests all circuits in the switch in numeric order.

   When testing a range of circuit, failing circuits appear first and passing circuits appear next.

   The number in field 13 increases by one as each circuit is tested.

   While testing all circuits in the switch or a trunk group, the following fields change as each circuit in the range is tested.

   Fields 2 and 3 shows the trunk group and number.

   Fields 4-8 shows the equipment location.

   Field 9 shows the circuit status (see Table 5-65).

   Field 10 shows the test state (see Table 5-67).

   Field 11 shows the TTL type (see Table 5-68).

   Field 13 shows the total number of circuits tested.

   Field 14 shows the total number of failures.

   Field 15 shows the trunk type.

   The test continues until DMIDS fills up, until you enter s , or until the switch tests the range you selected.

   The switch stores the failure information in DMIDS. If DMIDS fills up the test stops. Special error code 83 appears in the message line.

   Fields 2-8 show the original range of circuits you selected.

   Fields 13 and 14 show the total number of failures. If field 14 contains a 99 there are 99 or more failures.

   You can enter x to start the test again, enter nc to examine failures, or select a new range.

   CAUTION
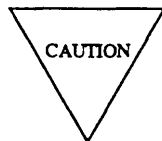
   Examine and record all failure data before you start the test again. When you start the test again, any test results gathered are lost. New failure data is kept.

If you want to stop the test before the range is tested, enter `s`

   Fields 2-8 show the circuit or range you selected.

   Field 10 shows the test state and contains a 9 (see Table 5-67).

   Field 13 shows the total number of circuits tested.

   Field 14 shows the total number of failures. If there are no failures, field 14 contains a 0.

Special error code 82 appears in the message line on your screen.

You can enter x to start the test again, enter `nc` to examine failures, or select a new range.

When the range is completely tested `WAIT` disappears from your screen.

3. Enter `nc` to see each circuit that was tested.

   Failing circuits appear first. Circuits that passed appear next.

   Fields 2 and 3 show the trunk group and trunk number.

   Fields 4-8 show the equipment location.

   Field 9 shows the current circuit status (see Table 5-65).

   Field 10 shows the test state (see Table 5-67).

   Field 11 shows the TTL type (see Table 5-68).

   Field 12 shows the fault code (see Table 5-69). Record this number.

   Field 13 contains a 0 or shows which failure you are currently viewing. As you view each failure the number in field 13 decreases by one.

   Field 14 contains a 0 or shows the number of fault codes recorded for the failing circuit.

   Field 15 shows the trunk type.

   If Field 12 contains a fault code other than 0, field 13 is equal to field 14 and field 14 shows the total number of fault codes recorded. If field 12 contains a 0 or field 13 contains a 1 (indicating a fault code) you can examine the failure data.

   Circuits appear in the order that they were tested.

4. If field 12 contains a 0 and field 13 contains a number greater than one, enter `nf` to see the fault codes logged for the circuit.

   The number in field 13 decreases each time you view a fault code.

   Field 9 shows the current circuit status (see Table 5-65).

   Field 10 contains a 5 if the test completed. If a circuit is in-use during the test, field 10 contains a 3 and field 12 contains a 5. Record any in-use circuits for later testing.

   After you view all fault codes field 13 contains a 1. If you enter `nf` again, the switch dashes fields 12-14.

5. If this is not the last circuit repeat steps 3-5.

   After you view all circuits that were tested, the switch dashes all fields on your screen. If you enter `nc` again, the summary appears.

⚠ CAUTION
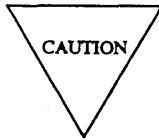
If you enter nu the first trunk in the next trunk group appears. All data stored in DMIDS is lost. Do not enter nu while displaying the tested circuits unless you are finished testing a trunk group.

6. If a circuit was in-use when you tested the range, enter nc until the circuit you want to test appears.

⚠ CAUTION

Examine and record all failure history information before you try to retest in use circuits. All prior test results are erased when you enter x

Field 9 shows the circuit status (see Table 5-65). If the circuit is still in use and field 12 contains a 5 the switch waits until the circuit is available and then tests it.

7. If you want to examine the ATMS failure history log or resolve alarms, go to test 1.

8. If you want to test a circuit and compare transmission measurements to administered thresholds, go to test 2.

To Busy Out a Circuit

1. Make sure that you have selected a circuit.

   If you busy out an ISDN trunk at the local end, the switch sends a signal to busy out the far end. It may take a few minutes to busy out an ISDN trunk at the far end. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is busied out at both ends.

⚠ CAUTION
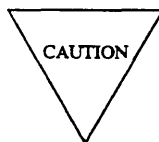
If you busy out a trunk that is in use you drop customer calls on the trunk.

2. Enter bo to busy out a circuit.

3. If you want to examine the ATMS failure history log and to resolve alarms, go to test 1.

4. If you want to test a circuit and compare transmission measurements to administered thresholds, go to test 2.

To Release a Circuit from Busy

1. Make sure that you have selected a circuit to release from busy.

   If you want to release an ISDN trunk, the local and far end must agree to release the ISDN trunk from busy. If the ISDN trunk is busy at the far end you cannot release the trunk and the trunk will be in

limbo or stay busied out. Look at the status of each trunk with Procedure 635 Test 1 or Procedure 648 Test 3 to ensure that the trunk is released from busy at both ends.

2. Enter `rb` to release the circuit from busy.

3. If you want to select another circuit, go to *To Select a Circuit or Range of Circuits.*

4. If you want to examine the ATMS failure history log and to resolve alarms, go to test 1.

5. If you want to test a circuit and compare transmission measurements to administered thresholds, go to test 2.

Special Error Codes

While using Procedure 647 you may see the following special error codes:

- `81=The message transmission to the module processor failed.`

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=You entered s before the range was completely tested.`

    You stopped the test of a range before the switch tested the range. Enter `nc` to examine each failure. Select a new range or enter x to continue testing the range on your screen.

- `83=DMIDS overflowed before the range was completely tested`

    You are testing a range and there are so many failures that DMIDS filled up. The test stops. If field 13 contains a `99,` there are 99 or more failures. Enter `nc` to examine each failure. Enter x to continue the range or select a new range.

TABLE 5-65

Field 9 Circuit Status		
0	=	Idle
1	=	In use
2	=	Demand maintenance busy
3	=	Automatic maintenance busy

TABLE 5-66

Field 10 Alarm Status		
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded

TABLE 5-67

Field 10 Test State		
1	=	Resolving contention
2	=	Getting originating test line (OTL)
3	=	Seizing trunk
4	=	Test in progress
5	=	Test complete
6	=	Test complete with unacceptable trunk transmission measurements
9	=	Test done and summary information on your screen

TABLE 5-68

Field 11 TTL Type		
0	=	No terminating test line administered
1	=	102 or old 100-type
2	=	New 100-type
3	=	LC-145 or SN-260A
4	=	SN-260B
5	=	56A or 105 without return loss
6	=	SN-261, ZLC-12, TN771B, or 105 with return loss

Procedure Fields

The fields listed below are data entry fields.

- In test 2 and 3 you can select a specific trunk group to be tested in field 2.
- In test 2 and 3 you can select trunk group and trunk number in fields 2 and 3.
- In test 2 and 3 you can select an equipment location in fields 4-8.

The meaning of the fields are:

2.	Trunk Group	Lists the trunk group number. To find the services the trunk group offers, go to Procedure 100.
		Services can be assigned to trunk groups 18-999. Trunk groups 0-17 are reserved for special trunk-group functions.
3.	Trunk Number	Shows which trunk you are viewing in the trunk group.
4-8.	EQUIPMENT LOCATION	Shows the equipment location of the trunk being tested.
9.	Circuit Status	Shows the circuit status.
		Table 5-65 lists the circuit status encodes
10.	Alarm Status or Test State	In test 1 field 10 shows the alarm severity.
		In test 2 field 10 shows the test state as the test call progresses and when the call is complete. If field 10 contains encodes 2-4 you can only view the fault code. No other measurement data is available. If field 10 contains a 6, the measurement was marginal or unacceptable. If field 10 contains a 5, the measurement was acceptable. If field 10 contains a 3, the circuit was in-use during the test (but still may be within the thresholds).
		In test 3 field 10 shows the test state as the test progresses.
11.	TTL Type	Shows the TTL type.

TABLE 5-69

Field 12 Fault Code		
0 = Passed all tests	71 = Bad I/Oto or from OTL	
1 = Originating test line (OTL) in use	72 = Cannot seize Originating register	
2 = Originating test line (OTL) not available	73 = Dialing of trunk verification by station (TVS) feature failed	
3 = Originating test line (OTL) maintenance busied	74 = Code dialed DID not match TVS feature access	
4 = No terminating test line (TTL) administered	75 = Trunk group dial access code inappropriate	
5 = Trunk in use	76 = Software record incorrect	
6 = Cannot release the trunk from busy	77 = ADFTC and trunk cannot be connected	
11 = Failed 404 Hz far end to near end deviation threshold	78 = Intercept tone from near end	
12 = Failed 1004 Hz at 0 dBm loss far end to near end loss threshold	79 = Reorder tone from near end	
13 = Failed 2804 Hz far end to near end deviation threshold	80 = Other unexpected tone	
21 = Failed 404 Hz near end to far end deviation threshold	81 = Ring no answer from near end	
22 = Failed 1004Hz at 0 dBm loss near end to far end loss threshold	82 = Unidentifiable interrupted tone	
23 = Failed 2804 Hz near end to far end deviation threshold	83 = Busy from far end	
31 = Failed 1004Hz at-16 dBm far end to near end level loss threshold	84 = Far end release	
32 = Failed 10C4 HZ at-16 dBm near end to far end level loss threshold	85 = No response from far end	
33 = Failed near end C-message noise threshold	86 = No data returned from far end	
41 = Failed far end C-message noise without tone threshold	87 = Steady unidentifiable tone from far end	
42 = Failed near end C-message noise with tone threshold	88 = Broad band energy from far end	
43 = Failed far end C-message noise with tone threshold	89 = Far end test line unavailable	
51 = Failed near end low frequency singing return loss threshold	90 = Near end self-test failed	
52 = Failed near echo return loss threshold	91 = Far end loss self-test at 0 dBm 1004 Hz failed	
53 = Failed near end high frequency singing return loss threshold	92 = Far end noise self-test failed	
61 = Failed far end low frequency singing return loss threshold	93 = Far end high frequency singing return loss self-test failed	
62 = Failed far end echo return loss threshold	94 = Far end echo return loss self-test failed	
63 = Failed far end high frequency singing return loss threshold	95 = Far end singing return loss self-test failed	
67 = No test tone resumed from far end (105 type only)	96 = Far end loss self-test at -16 dBm 1004 Hz failed	
68 = Originating test line (OTL) not assigned as rotary	97 = Far end lass self-test at -16 dBm 404 Hz failed	
69 = ADFTC/MTCP received unsent stop test message	98 = Far end loss self-test at -16 dBm 2804 Hz failed	
70 = ADFTC/MTCP self-test failed		

12.	Fault Code	Field 12 shows the fault code (see Table 5-69). Record all fault codes. If the circuit was in use, field 12 contains fault code 5. Record each in-use circuit so you can test them later.

In test 2, shows which set of measurements you are viewing or shows the fault code for the circuit. The number in field 12 increases from 10 to 60 by tens. Measurement results give further diagnostic information so you can find if the passing circuits are within marginal thresholds or if the thresholds need to be adjusted.

The switch may log up to 18 measurements for each circuit, depending on the TTL type. There are six sets of three measurements.

13.	PMIDS Failure Index, No. Tested I Index I Result, No. Tested I Index	In test 1 field 13 initially shows the number of ATMS failures in PMIDS. After you view the summary, field 13 shows which circuit you are viewing. The number in field 13 decreases by one as you view each failure.

In test 2, fields 13-15 show three measurement results. Values range from 0-74, and 91-99 (for negative numbers 1-9). If fields 13-15 are dashed the measurement does not apply for the terminating test line.

Initially shows the number of circuits that were tested. Then shows which failure you are viewing. Finally shows the first measurement result.

In test 3 this field initially shows the number of circuits that were tested. Then shows which failure you are viewing.

14.	Number of Failures, No. Failed I Circuits I Result, No. Failures I Circuits	In test 1 this field shows the number of failures in PMIDS.

In test 2 this field initially shows the number of circuits with failures. Then shows the number of times the circuit failed. When you are examining measurement results this field contains the second measurement result. Table 5-64 shows the measurement result encodes.

In test 3 this field initially shows the number of circuits with failures. Then shows the number of times the circuit failed.

15.	Trunk Type or Trunk Type I None I Result	Initially shows the trunk type from Procedure 100 Word 1. When you are examining measurement results, this field contains the third measurement result. Table 5-64 shows the measurement result encodes.

PROCEDURE 648 - ISDN PRI FACILITIES TESTS

Purpose

Use Procedure 648 to examine the integrated services digital facilities primary rate interface (ISDN PRI) failure history log, to resolve ISDN PRI alarms, and to test the ISDN PRI facilities.

Tests

Procedure 648 has three tests.

- Use test 1 to examine the ISDN PRI failure history log and to resolve alarms.

- Use test 2 to test a single D-channel or range of D-channels at the ISDN PRI level 2 layer.

- Use test 3 to test a single B-channel or a range or B-channels at the ISDN PRI level 3 layer with a loop around test, and to do bit and block error rate analysis.

Procedure Overview

DEFINITY Generic 2 provides a 1.544 Mbps ISDN PRI interface that includes B-channels (used for voice or data calls) and D-channels that are used for signaling. In a facility associated signaling (FAS) arrangement, one D-channel does the signaling and call control for up to 23 B-channels. Nonfacility associated signaling (NFAS) is an enhancement to ISDN PRI. In an NFAS arrangement, one D-channel does the signaling and call control for up to 479 B-channels. In an NFAS arrangement, D-channel backup is recommended. Use procedure 648 to examine ISDN failures. The traditional module uses circuit pack ANN35. The universal module uses circuit packs TN767 and TN555 circuit packs carry voice or data.

The ISDN PRI protocol uses layers to separate functions in the communications. Test 2 tests the data link layer. Use test 2 to send a test frame to the far end via a selected signaling (D) channel interface and to verify the response.

Test 3 tests layer 3 (the network layer). The switch uses the ADFTC or MTCP circuit pack to test ISDN PRI trunks. The switch makes a test call from an originating test line (OTL) (an ADFTC or MTCP) to a terminating test line (TTL) on the far end, through an ISDN PRI trunk, using the associated bearer (B) channel. A digital stream is sent from the ADFTC or MTCP to the far end where it is looped back to the ADFTC or MTCP for bit and block error rate analysis. Bit and block error rates only appear in test 3.

Test 1 - Operation

Use test 1 to examine the ISDN PRI failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen choose one of the following:

    ● If you are **already in** the procedure, but not in test 1, enter `t1`

    ● Otherwise, enter `p648`

    The test 1 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 648, TEST: 1
                    EXAMINE THE ISDN FACILITIES FAILURE HISTORY LOG


EQUIPMENT LOCATION
    4.   Module:  ▢
    5.  Cabinet:  ▢
    6.  Carrier:  ▢
    7.    Slot:   ▢
    8. Circuit:   ▢

10.      Alarm Status:  ▢
11. PMIDS Failure Index: ▢
12.  Number of Failures: ▢
13.        Data Index:  ▢
14. Specific Fault Cede: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[      ][      ][ F3 DATA ][      ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the ISDN PRI Failure History Log

1. Enter x to see the ISDN PRI failure history summary.

   Field 12 shows the number of failing D-channels (the failure summary). There can be up to 30 failing D-channels. If there are no failures, field 12 contains a 0.

2. Enter nc to see each failure.

   Fields 4-7 show the D-channel equipment location. Record the equipment location.

   Field 10 shows the alarm status of the failing D-channel (see Table 5-73).

   Field 11 shows which failure you are viewing. The failure index at first equals the number of failures in field 12. The number in field 11 decreases by one as you view each failure.

   Field 12 shows the total number of failing D-channels in PMIDS.

   Field 13 shows the data index and contains a 1.

   Field 14 shows the specific fault code. Record this number.

3. Go to test 2 and test the D-channel that failed.

4. If this is not the last failure, repeat steps 1-4.

   After you view all failures, the switch dashes fields 2-14. If you enter nc again, the failure summary appears.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to test a single D-channel or range of D-channels at layer 2, go to test 2.

7. If you want to test a single B-channel or range of B-channels at layer 3, go to test 3.

To Resolve Alarms

1. If you want to resolve all alarms, make sure that the summary is on your screen.

    If the summary is not on your screen, enter `x`

2. If you want to resolve a single alarm, make sure that the alarmed entry is on your screen.

    If the alarmed entry is not on your screen, enter `x` and then enter `nc` until the alarmed entry you want to resolve appears.

CAUTION
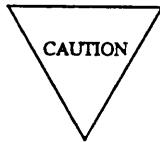
Record all alarms before you resolve any alarms from the ISDN PRI failure history log. Then you will have a failure history you can use for future troubleshooting.

3. Enter `cdx` to resolve alarms.

    If you resolved a single alarm, field 10 contains a 5. If you resolve all alarms, field 12 shows the total number of failures that are not alarms still in the log.

    The switch marks the alarms resolved. The switch turns off **OTHER FAILS, MAJOR, MINOR,** or **WARNING** on the common-control alarm panel if there is no other reason for them to be on. MAJOR and MINOR disappear from your screen if there are no other reasons for them to be on.

4. If you want to test a single D-channel or range of D-channels at layer 2, go to test 2.

5. If you want to test a single B-channel or range of B-channels at layer 3, go to test 3.

Test 2 - Operation

Use test 2 to test a single D-channel or a range of D-channels at the ISDN PRI level 2 layer.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen choose one or both of the following:

   - To start the procedure, enter `p648`

   - If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 648, TEST: 2
                        TEST THE ISDN D CHANNEL

EQUIPMENT LOCATION
    4.   Module: ▢
    5. Cabinet: ▢
    6. Carrier: ▢
    7.   Slot : ▢
    8. Circuit: ▢

10.          Test State: ▢
11. DMIDS Failure Index: ▢
12.  Number of Failures: ▢
14.                Data: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[        ][      ][ F3 DATA ][      ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Fields 4-7 may contain a default ISDN PRI D-channel equipment location from test 1 or 3, Procedure 600 Test 1 or 3, Procedure 620, Procedure 625, or Procedure 647.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

2.   If you want to test the default D-channel, go to *To Test a D-Channel or a Range of D-Channels.*

To Select a D-Channel or a Range of D-Channels

To select all D-channels in the switch, in a module, in a cabinet, in a carrier, or in a slot, use the following steps.

1. If you want to test all D-channels in the switch, enter `cf4` and enter ; in fields 4-8.

2. If you want to select all D-channels in a module, enter `cf4` and, enter the module.

3. If you want to select all D-channels in a cabinet, enter `cf4` and enter the module and cabinet.

4. If you want to select all D-channels in a carrier, enter `cf4` enter the module, cabinet, and carrier.

5. If you want to select a specific D-channel on a PRI circuit pack choose from the following:

   - Enter `cf4` and enter the module, cabinet, carrier, and slot.

   - Enter `nc` until the D-channel you want to test appears.

6. Go to *To Test a D-Channel or a Range of D-Channels.*

To Test a D-Channel or a Range of D-Channels

1. Make sure that you have selected a D-channel or a range of D-channels to test.

2. Enter x to test a D-channel or range of D-channels.

   WAIT appears on your screen. If you selected a single NFAS primary or backup D-channel, the alternate D-channel will also be tested.

   If you are testing a range, the following fields change as each D-channel in the range is tested.

   > Fields 4-7 show the D-channel equipment location.

   > Field 10 shows the test state (see Table 5-74).

   > Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

   If you want to stop the test before range is completely tested, enter s

   WAIT disappears from your screen and special error code **82 appears**.

   > Field 12 shows the number of failures.

   You can enter nc to step through each failure, enter x to continue testing the range, or select a new range. If you enter x to continue testing the range, new test results are added to the previous test results.

   When the test is done WAIT disappears.

   > Fields 4-7 show the original D-channel or range of D-channels you selected.

   > Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

   > Field 14 shows the number of D-channels that were tested.

3. Enter nc to view each failure.

   > Fields 4-7 show the D-channel equipment location.

   > Field 11 shows the failure index. The number in field 11 decreases by one as you view each failure.

   > Field 12 shows the total number of failures.

   > Field 14 shows the test data (see Table 5-76).

4. If there is a failure, go to *DEFINITY™ Communication System Generic 2 Maintenance Repair Strategies* (555-104-118). and follow the repair steps for unit type 76.

5. If this is not the last failure repeat steps 3-5.

   After you view all failures, the switch dashes all fields. If you enter nc again, the summary appears.

Test 3 - Operation

Use test 3 to test a single B-channel or a range or B-channels at the ISDN PRI level 3 layer with a loop around test, and to do bit and block error rate analysis.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter `p648`

   - If you are already in the procedure, but not in test 3, enter `ts`

   The test 3 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 648, TEST: 3
                       TEST THE ISDN B CHANNEL

2. Trunk Group Number: ☐
3.        Trunk Number: ☐


EQUIPMENT LOCATION
    4.   Module: ☐
    5. Cabinet: ☐
    6. Carrier: ☐
    7.    Slot: ☐
    8. Circuit: ☐

9.      Circuit Status: ☐
10.         Test State: ☐
1. DMIDS Failure Index LDS1 Channel Number: ☐
2. Number of Failures: ☐
3.         Data Index: ☐
4.              Data: ☐



Connected to CC0 ON-LINE ♡ ┃ MAJOR ┃┃ MINOR ┃┃ RUN TAPE ┃┃ BUSY OUT ┃┃ IN USE ┃┃ WAIT ┃

enter command: ▬
┃_____┃┃___┃┃F3 DATA┃┃____┃┃F5 HELP┃┃F6 FIELD┃┃F7 INPUT┃┃F8 CMDS┃
```

Fields 4-7 may contain a default ISDN PRI D-channel equipment location from test 1 or 3, Procedure 600 Test 1 or 3, Procedure 620, Procedure 625, or Procedure 647.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

2. If you want to test the default B-channel, go to *Test an ISDN PRI B-Channel*

To Select a B-Channel or a Range of B-Channels

To select all ISDN PRI B-channels in the switch, all ISDN PRI B-channels in a trunk group, all ISDN PRI B-channels on a PRI B-channel pack, or a single ISDN PRI B channel use the following steps.

1. If you want to select all ISDN PRI B-channels in the switch, enter `cf2` and ; to blank out fields 2-8.

    The switch tests the first trunk circuit in the first numerical trunk group and then tests all ISDN PRI B-channels.

2. If you want to select all ISDN PRI B-channels in a trunk group, choose from the following:

    • Enter `cf2` and then enter the trunk group number in field 2.

    • Enter `nu` until the trunk group you want to test appears.

    The switch tests the first ISDN PRI B-channel in the trunk group you selected and then tests all ISDN PRI B-channels in the trunk group.

3. If you want to select a specific B-channel by trunk group and trunk, choose from the following:

    • Enter `cf2` and then enter the trunk group and trunk number.

    • Enter `nc` until the trunk you want to test appears.

4. If you want to select a specific PRI circuit pack, choose from the following:

    • Enter `cf4` and enter the module, cabinet, carrier, and slot.

    • If a B-channel is already on your screen, enter `nc` until the next translated DS1 channel (up to 24) appear.

    The switch tests the first ISDN PRI B-channel on the PRI circuit pack and then tests all ISDN PRI B-channels on the circuit pack.

5. If you want to select the test length, go to *To Select the Test Length.*

6. If you selected a single B-channel go to *To Test a B-Channel.*

7. If you selected a range of B-channels go to *To Test a Range of B-Channel.*

To Select the Test Length

1. If you want to change the test length, enter `cf14` and enter the test length in minutes (up to 126). Table 5-70 shows the test length encodes.

2. If you selected a single B-channel, go to *To Test a B-Channel.*

3. If you selected a single B-channel, go to *To Test a Range of B-Channels.*

To Test a B-Channel

1. Make sure that you have selected an ISDN PRI B-channel to test.

2. Enter `x` to test the ISDN PRI B-channel.

    `WAIT` appears on your screen.

    The number in field 10 changes during the test and shows the current test state.

    If you want to stop the test before the testis complete, enter s

    `WAIT` disappears from your screen and special error code 82 appears in the message line on your screen.

    Field 12 contains a 0.

    You can enter `x` to test the B-channel again or you can select a new B-channel to test.

    When the test is done, `WAIT` disappears from your screen.

    Fields 2 and 3 show the trunk group and trunk group member of the tested ISDN PRI B-channel.

    Fields 4-8 show the equipment location.

    Field 9 shows the circuit status (see Table 5-72).

    Field 10 shows the summary display encode (see Table 5-74).

    Field 12 contains a 1 if the B-channel failed. If there are no failures, field 12 contains a 0.

    Field 13 shows the data index and contains a 4 (see Table 5-75).

    Field 14 shows the number of B-channels tested and contains a l (since a single B-channel was tested).

3. Enter `nc` to view the fault code.

> Fields 2 and 3 show the trunk group and trunk number.
>
> Fields 4-8 show the equipment location.
>
> Field 9 shows the circuit status (see Table 5-72).
>
> Field 10 shows the test state.
>
> Field 11 shows the failure index. The number in field 11 increases by one as you view each failure.
>
> Field 12 shows the number of failures.
>
> Field 13 shows the data index and contains a 1 (see Table 5-75).
>
> Field 14 shows the fault code logged in DMIDS against the failing B-channel (see Table 5-77). If the test passed field 14 contains a 0. If field 14 contains encodes 1-3, no measurement data is available.

If you enter `nc` again, the switch dashes all fields. If you enter `nc` again, the summary appears.

4. To see other data codes, choose from the following:

- Enter `nd` until field 13 contains a 2.

Field 14 shows the bit error rate. Refer to Figure 5-26 to interpret the bit error rate.

- Enter `nd` until field 13 contains a 3.

> Field 14 shows the block error rate. Refer to Figure 5-26 to interpret the block error rate.

- Enter `nd` until field 13 contains a 4.

> Field 14 shows the number of B-channels tested.

- Enter `nd` until field 13 contains a 5.

> Field 14 shows the test length (see Table 5-70).

TABLE 5-70

Test Length Encodes	
- or 127	8 seconds
0	send one block
1-126	number of minutes at one block per second

- Enter `nd` until field 13 contains a 1

> Field 14 contains the fault code (see Table 5-77).
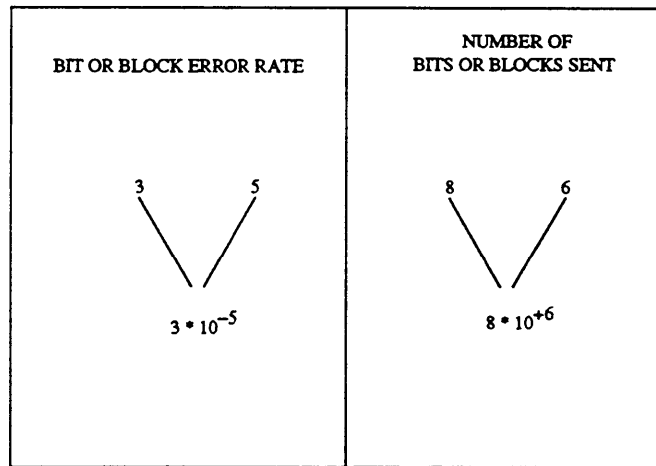
Figure 5-26.   Bit and Block Rate Analysis

5. If you want to examine the ISDN PRI failure history log, go to test 1.

6. If you want to test a single D-channel or range of D-channels at layer 2, go to test 2.

To Test a Range of B-Channels

1. Make sure that you have selected a range of ISDN PRI B-channels to test.

2. Enter x to test the range.

   WAIT appears on your screen.

   If you are testing the entire switch, an entire trunk group, or PRI circuit pack, the following fields are incremented as a B-channel is tested:

   > Fields 2 and 3 show the trunk group and trunk group member.

   > Fields 4-8 show the equipment location of B-channel being tested.

   > Field 10 shows the test state (see Table 5-74).

   > Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

   If an ISDN PRI B-channel is maintenance busied, it is released from busy while under test and restored to maintenance busied when the test is done.

   If the switch finds a B-channel in use while testing a range of B-channels, the switch logs an in use fault code in DMIDS. The switch tests the next B-channel.

   If DMIDS becomes full at any time during range testing, test 3 stops and WAIT disappears.

   > Field 2-8 show the original range of B-channels you selected.

   > Field 12 shows the number of failures. If field 12 contains a 99, there are 99 or more failures.

You can enter `x` to test the range again, enter `nc` to see failure information, or select a new range.

If you start the test from where it stopped because of a DMIDS overflow, test results gathered to that point are added to the old results.
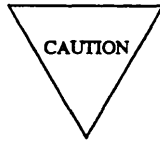
CAUTION   Before you start the test again, examine and record all failures in the failure history log.

If you tested a range, the following appears

Field 12 shows the total number of failures.

Field 13 shows the data index and contains a 4 (see Table 5-75).

Field 14 shows the number of B-channels tested.

If you want to stop the test, while testing a range, enters

`WAIT` disappears from your screen and the summary appears and special error code 82 appears in the message line.

Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.
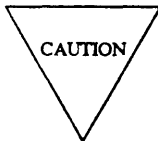
CAUTION   If you did not completely test the range, record all failure data. Do not select another range without recording failure data for the previous range of ISDN PRI B-channels.

You can enter `nc` to look at each B-channel in the range, enter x to continue testing the range, or select a new range. If you continue testing the range, new test results are added to DMIDS.

When the range is completely tested, `WAIT` disappears from your screen.

Fields 2 and 3 show the trunk group number and trunk.

Fields 4-8 show the equipment location.

Field 9 shows the circuit status (see Table 5-72).

Field 10 shows the summary display encode (see Table 5-74).

Field 11 contains a 1 if there are failures.

Field 12 shows the number of failures. If there are no failures, field 12 contains a 0.

Field 13 shows the data index and contains a 4 (see Table 5-75).

Field 14 shows the number of B-channels tested.

3. Enter nc to see each fault code.

    Field 11 shows the failure index. The number in field 11 increases by one as you view each failure.

    Field 13 shows the data index and contains a 1 (see Table 5-75).

    Field 14 shows the fault code logged in DMIDS against the failing B-channel (see Table 5-77).

4. To see other data codes, choose from the following:

    • Enter nd until field 13 contains a 2.

    Field 14 shows the bit error rate. Refer to Figure 5-27 to interpret the bit error rate.

    • Enter nd until field 13 contains a 3.

    Field 14 shows the block error rate. Refer to Figure 5-27 to interpret the block error rate.

    • Enter nd until field 13 contains a 4.

    Field 14 shows the number of B-channels tested.

    • Enter nd until field 13 contains a 5.

    Field 14 shows the test length (see Table 5-71).

TABLE 5-71

Test Length Encodes	
- or 127	8 seconds
0	send one block
1-126	number of minutes at one block per second

    • Enter nd until field 13 contains a 1.

    Field 14 contains the fault code (see Table 5-77).

5. If this is not the last B-channel that was tested, repeat steps 3-5.

    Record all B-channels that were in use during the test.
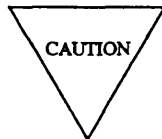
⚠ CAUTION   You should only test a B-channel that was in use after you examine all test 3 failure history and bit/block error rate information for passing B-channels. If you test a B-channel that is in use, all prior test results are lost.
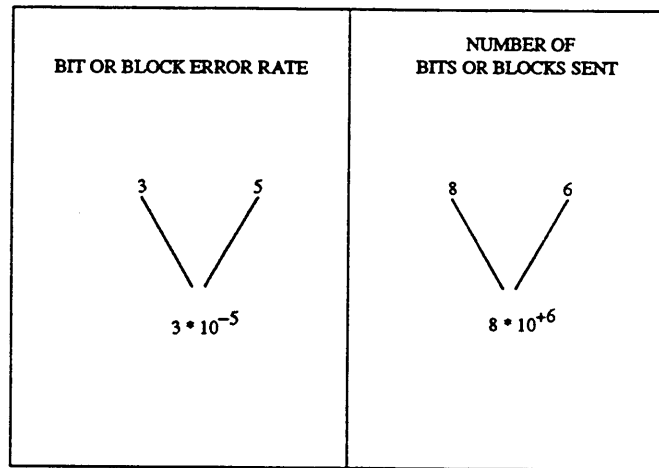
Figure 5-27. Bit and Block Rate Analysis

6. To select a B-channel that was in-use when you first tested it, choose from the following:

    ● Enter nc until the in-use circuit you want to test appears.

    ● Enter cf4 and enter the B-channel location in fields 2-3 or fields 4-8.

        Field 9 shows the circuit status (see Table 5-72).

7. Enter x to test an in use B-channel.

    If the B-channel is still in-use field 8 contains an 8. You must enter x again to test an in-use circuit. The switch waits until the B-channel is available and then tests it.

        Field 10 contains a 2 until the B-channel is available (see Table 5-74).
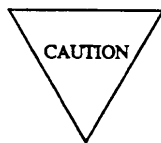
CAUTION — Do not try to test a dedicated switch connection that is in-use. A dedicated switch connection is always in use. The test will continue to mark the circuit as in-use.

8. If you want to test another circuit that is in-use, repeat steps 6-8.

9. If you want to examine the ISDN PRI failure history log, go to test 1.

10. If you want to test a single D-channel or a range of D-channels at layer 2, go to test 2.

To Busy Out a B-Channel

1. Make sure that you have selected a B-channel to busy out.

    If you have not selected a B-channel, go to *To Select a B-Channel or a Range of B-Channels.*

2. Enter `bo` to busy out the B-channel on your screen.
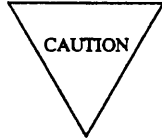
> ⚠ CAUTION   If the circuit status equals 1 or 2, entering `bo` aborts any calls in progress.

3. If you want to examine the ISDN PRI failure history log, go to test 1.
4. If you want to test a single D-channel or range of D-channels at layer 2, go to test 2.

To Release a B-Channel from Busy

1. Make sure that you have selected a B-channel to release from busy.

    If you have not selected a B-channel, go to *To Select a B-Channel or a Range of B-Channels.*

2. Enter `rb` to release the B-channel from busy.
3. If you want to examine the ISDN PRI failure history log, go to test 1.
4. If you want to test a single D-channel or a range of D-channels at layer 2, go to test 2.

Special Error Codes

While using Procedure 648 you may see the following special error codes:

- `81=The message transmission to the module processor failed.`

    You entered a command, and the command was not received by the module processor. If you tried to busy out or release, the attempt failed. Try again.

- `82=You entered s before the range was tested.`

    If you did not completely test the range, record all failure data. Do not select another range without recording failure data for the previous range of ISDN circuits. Enter x to continue testing the range or select a new range.

- `83=DMIDs overflow.`

    If DMIDS fills up enter `nc` to look at test results.

- `84= There   are   no   D-channel on   this   PRI   circuit   pack.     Check translation.`

    You tried to test a D-channel on a PRI circuit pack but there are no D-channels on the circuit pack you selected. Enter a new equipment location or check translation.

- `85= There are no D-channels in the range you selected.`

    You tried to test a D-channel, but there are no D-channels in the range you selected. Select another range or check translation.

- `86= There is no B-channel on the PRI circuit pack you selected.`

    You entered an equipment location of a circuit pack that does not have a B-channel. Enter the correct equipment location or check translation.

TABLE 5-72

Field 9 Circuit Status		
0	=	Idle
1	=	In use
2	=	In use far-end test call
3	=	Demand maintenance busy
4	=	Auto maintenance busy
5	=	Far-end maintenance busy
6	=	Trunk records in invalid or transitory state

TABLE 5-73

Field 10 Alarm Status		
0	=	No Alarms
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarm resolved

TABLE 5-74

Field 10 Test State		
1	=	Getting ADFTC
2	=	Seizing trunk
3	=	Testing
4	=	Test complete
5	=	Changing ISDN level 3 status
9	=	Test done - summary display

TABLE 5-75

Field 13 Data Index		
1	=	Field 14 shows the fault code
2	=	Field 14 shows the bit error rate
3	=	Field 14 shows the block error rate
4	=	Field 14 shows the number of circuits tested
5	=	Field 14 shows the test length

TABLE 5-76

Test 2, Field 14 Data		
0	=	Pass
22	=	Invalid response on level 2 primary link
23	=	No response on level 2 primary link
35	=	Invalid response on level 2 backup link
36	=	No response on level 2 backup link

Procedure Fields

The fields listed below are data entry fields.

- In test 3 you can enter a trunk group number in field 2.

- In test 3 you can enter a trunk number in field 3.

- In tests 2 and 3 you can enter a D-channel equipment location in fields 4-7.

- In test 3 you can enter a B-channel equipment location in fields 4-8.

- In test 3 you can select the test length in field 14.

The meaning of the fields are:

2.	Trunk Group Number	Shows the trunk group number. To find the services the trunk group offers, go to Procedure 100. Services can be assigned to trunk groups 18-999. Trunk groups 0-17 are reserved for special trunk-group functions.
3.	Trunk Number	Shows which trunk in the trunk group you are viewing.
4-8.	EQUIPMENT LOCATION	In test 1 you can view an ISDN D-channel equipment location in fields 4-7. In test 2 you can select an ISDN D-channel equipment location in fields 4-7. In test 3, you can enter a D-channel equipment location in fields 4-7 or a B-channel equipment location in fields 4-8.
9.	Circuit Status	Shows whether the ISDN PRI B-channel is in-use or idle, if it is busied out and why, or indicates that the trunk record is not valid.
10.	Alarm Status or Test State	In test 1 this field shows the alarm status. Table 5-73 lists the alarm status encodes. In tests 2 and 3 this field shows the test state as the test progresses. Table 5-74 lists the test state encodes.
11.	PMIDS I DMIDS Failure Index or DS1 Channel Number	Shows which failure you are currently viewing. In test 1, you are viewing failures in PMIDS. In test 2, you are viewing failures in DMIDS. In test 3, field 11 shows which DS1 channel you are viewing while you are selecting a circuit on a ISDN PRI circuit pack and while you are testing the circuit pack. When test 3 is complete, field 11 shows which failure you are viewing in DMIDS.

TABLE 5-77

Test 3, Field 14 Fault Codes	
0 = Pass	17 = Software record incorrect
1 = ADFTC or MTCP is not available	18 = Trunk cannot be connected
2 = ADFTC or MTCP is in use	19 = OTL went on-hook
3 = ADFTC or MTCP is maintenance busied	20 = Bad I/O from OTL
4 = The current test is not translated for this board	21 = Cannot seize originating register
5 = Cannot put the trunk in ISDN PRI maintenance state - queue occupancy or ISDN feature not activated	24 = Start handshake not received by ADFTC or MTCP
6 = Trunk went to ISDN PRI maintenance state - did not release from busy	25 = Error overflow detected by ADFTC or MTCP
7 = Maintenance service acknowledge not received	26 = No data received by ADFTC or MTCP
8 = Trunk is in use	27 = Data transmission to ADFTC or MTCP interrupted
9 = No TTL assigned	28 = No bit error rate response from ADFTC or MTCP
10 = Internal ADFTC or MTCP failure	29 = No block error rate response from ADFTC or MTCP
11 = OTL not assigned as rotary	30 = No bit or block error rate response from ADFTC or MTCP
12 = ADFTC or MTCP failed the self test	31 = Bit error rate threshold exceeded
13 = Bad I/O - no ISDN PRI Level 3 response in specified test time	32 = Block error rate threshold exceeded
14 = TVS DAC not assigned, or ADFTC or MTCP (OTL) not responding, or Keyboard dialing not assigned to the ADFTC or MTCP	33 = ADFTC or MTCP line is maintenance busy or ADFTC or MTCP is not on-hook
15 = Code dialed did not match TVS feature	34 = Bad I/O to lSDN PRI Level 2 link on near end ISDN level 2 interface
16 = Trunk group DAC Inappropriate	

12.	Number of Failures	Shows the number of failures in PMIDS or DMIDS.
13.	Data Index	Shows the data that field 14 contains. If field 13 contains a l, field 14 shows the fault code. If field 13 contains a 2, field 14 shows the bit error rate. If field 13 contains a 3, field 14 shows the block error rate. If field 13 contains a 4, field 14 shows the number of circuits tested. If field 13 contains a 5, field 14 shows the test length. Table 5-62 shows the data index encodes.
14.	Specific Fault Code, Fault Code or Data	In test 1, field 14 shows the specific fault code logged against the failure.

In test 2, field 14 shows the fault code logged against the failure. Table 5-76 lists the fault codes that may appear.

In test 3, if field 13 a 1, field 14 shows the fault code logged against the failure. Table 5-76 lists the fault codes that may appear.

If field 13 contains a 2 or a 3, the first two digits in field 14 are the bit or block error rate. The second two digits in field 14 are the number of bits or blocks sent. If field 14 contains zeroes, no bits or blocks were sent. If the first two digits in field 14 are blank, there was a zero error rate.

To get the bit or block error rate, multiply the first digit (left most side) by 10 raised to the negative power of the second digit (see Figure 5-27).

To get the number of bits or blocks sent, multiply the third digit by 10 raised to the positive power of the fourth digit (see Figure 5-27).

For example, if field 14 contains a 3586 the bit or block error rate equals 3 x 10 to the negative 5th. The number of bits or blocks sent equals 8 x 10 to the positive 6th.

If field 13 contains a 4, field 14 shows the number of circuits being tested. If field 13 contains a 5, field 14 shows the test length (see Table 5-71.

6. COMMON-CONTROL PERIPHERAL PROCEDURES

This chapter contains common-control peripheral procedures procedures. Common-control peripheral procedures test any equipment which can directly communicate with the common control through a non-network path. Common-control peripheral procedures include Procedure 650-656.

The following list summarizes the purpose of each common-control peripheral procedure.

PROCEDURE 650 - DCIU TESTS

Use Procedure 650 to examine the Data Communications Interface Unit (DCIU) failure history log, to resolve alarms, to test the DCIU system, and to initialize the DCIU.

PROCEDURE 651 - PCC TESTS

Use Procedure 651 to examine the processor communications circuit (PCC) failure history log, to resolve alarms, and to test the PCC.

PROCEDURE 652 - HARDWARE AND SOFTWARE TIME-OF-DAY CLOCK TESTS

Use Procedure 652 to examine the time-of-day clock failure history log, to resolve alarms, to test the hardware and software time-of-day clock, to set the hardware clock, and to set the software clock equal to the hardware clock.

PROCEDURE 653 - ATTENDANT CONSOLE TESTS

Use Procedure 653 to examine the attendant console failure history log, to resolve alarms, and to test attendant consoles.

PROCEDURE 654- DISPLAY TERMINALS TESTS

Use Procedure 654 to examine the display terminal failures history log, to resolve alarms, and to test a selected display terminal or all display terminals.

PROCEDURE 655 - SMDR TESTS

Use Procedure 655 to examine the station message detail recording (SMDR) failure history log, to resolve alarms, and to test the SMDR system.

PROCEDURE 656 - NCOSS AND CDRU TESTS

Use Procedure 656 to examine the network control operations support system (NCOSS) and call detail recording utility (CDRU) failure history log, to resolve alarms, and to test CDRU or NCOSS equipment.

PROCEDURE 650 - DCIU TESTS

Purpose

Use Procedure 650 to examine the Data Communications Interface Unit (DCIU) failure history log, to resolve alarms, to test the DCIU system, and to initialize the DCIU.

Tests

Procedure 650 has three tests.

- Use test 1 to see the DCIU failure history log and to resolve alarms.

- Use test 2 to test all DCIU circuits and to initialize the DCIU.

- Use test 3 to test the DCIU continuously.

Procedure Overview

Use Procedure 650 to find failures from the DCIU through the data link to a peripheral. If the DCIU system fails, the switch may light **APPL PROCR/AP INTER** or **MAJOR, MINOR,** or **WARNING** alarm indicators on the common-control alarm panel.

In test 3 there are two types of loopback tests you can do. You can select an internal loopback test or an external manual loopback test. The switch uses an internal loopback test to test the data link interface hardware. The internal loopback tests either an on-line or off-line DCIU. Only internal DCIU loop-back testing is allowed on the off-line common control. You may have to use a loopback connector to do an internal DCIU loopback test.

In the external manual loopback test, the switch sends a signal and you monitor the signal that is sent. To do a remote loopback test refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118).

You must beat the switch site to do the external manual loopback test. To test the DCIU you will also need the following equipment..

TABLE 6-1

Suggested Test Equipment		
Quantity	**Description**	**Comcode**
1	Group 6 loop-back plug	ED1E422-10

Test 1 - Operation

Use test 1 to examine the DCIU failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    - If you are already in the procedure, but not in test 1, enter `t1`

    - Otherwise enter `p650`

    The test 1 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 650, TEST: 1
                      EXAMINE THE DCIU FAILURE HISTORY LOG

EQUIPMENT LOCATION
    2.     Module: ▯
    3.    Cabinet: ▯
    4.    Carrier: ▯
    5.       Slot: ▯
    6. Data Link: ▯


FAILURE STATUS
    8. Alarm Status: ▯
    9.  DCIU Status: ▯


FAILURE HISTORY
  11. PMIDS Failure Index: ▯
  12.          Fault Code: ▯




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▬
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

Field 9 shows the DCIU status (see Table 6-4).

To find the meaning of any field on your screen go to *Procedure Fields* at the end of this procedure.

To Examine the DCIU Failure History Log

1. Enter x to sort the DCIU failure history log.

   The switch sorts DCIU failures by alarm severity.

      Field 11 shows the total number of DCIU failures. If there are no DCIU failures, field 11 contains a 0.

2. Enter nc to see each failure.

      Fields 2-5 show the data-link equipment location.

      Field 6 shows the data link number. Fields 5 and 6 are dashed if a specific DCIU circuit pack or data link cannot be identified for the fault code in field 12.

      Field 8 shows the alarm status (see Table 6-3).

      Field 9 shows the DCIU status (see Table 64).

      Field 11 shows which of the six failures in the buffer you are viewing. The number in this field increases by one as you view each failure.

      Field 12 shows the specific fault code. Record this number.

3. Go to test 2 and test the DCIU circuit that failed.

4. If there are more failures, repeat steps 2-4.

   After you view all failures, the switch dashes field 9. If you enter nc again, the first failure appears.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to test all DCIU circuit packs, go to test 2.

7. If you want to test the DCIU with a data link loopback test, go to test 3.

To Resolve Alarms

You may want to resolve invalid alarms from the DCIU failure history log.

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter `x` and then enter `nc` until the alarm you want to resolve appears.

2. If you want to resolve all alarms, make sure that the summary is on your screen.

   If the summary is not on your screen, enter `x`
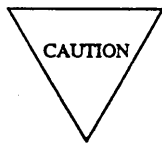
> **CAUTION**
>
> Record all alarms, and the specific fault code and equipment location for each alarm, before you resolve any alarm from the log. Then you will have a failure record you can use for future troubleshooting.

3. Enter `cdx` to resolve alarms from the log.

   The switch marks DCIU alarms resolved.

   > If you resolve a single alarm, field 8 contains a 5 (see Table 6-3). If you resolve all alarms, field 8 contains a 0.

   The switch turns off the **APPL PROCR AP INTER** on the common-control alarm panel if there is no other reasons for it to be on.

   `MAJOR` and `MINOR` disappear from you screen if there is no other reason for them to be on.

4. If you want to test all DCIU circuit packs, go to test 2.

5. If you want to test the DCIU with a data link loopback test, go to test 3.

Test 2 - Operation

Use test 2 to test all DCIU circuits and to initialize the DCIU.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    ● To start the procedure enter p650

    ● If you are already in the procedure, but not in test 2, enter t2

    The test 2 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 650, TEST: 2
                DO A VERIFICATION TEST ON DCIU CIRCUITS


EQUIPMENT  LOCATION
   2.     Module: ▢
   3.    Cabinet: ▢
   4.    Carrier: ▢
   5.       Slot: ▢
   6. Data Link: ▢


FAILURE  STATUS
   8.          Alarm Status: ▢
   9.          DCIU Status: ▢
  10.     Data Link Status: ▢
  11. DMIDS Failure Index: ▢
  12.          Fault Code: ▢






Connected to CC0 ON-LINE ♡ ⌈ MAJOR ⌉⌈ MINOR ⌉⌈ RUN TAPE ⌉⌈ BUSY OUT ⌉⌈ IN USE ⌉⌈ WAIT ⌉

enter command: ▃
⌈_____⌉⌈_____⌉⌈F3 DATA⌉⌈_____⌉⌈F5 HELP⌉⌈F6 FIELD⌉⌈F7 INPUT⌉⌈F8 CMDS⌉
```

Field 9 shows the DCIU status (see Table 6-4).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a DCIU Circuit

1. Enter x to test the DCIU circuit.

    WAIT appears on your screen.

    >   Field 8 contains a 5 if PMIDS contains resolved DCIU alarms (see Table 6-3).

    >   Field 9 shows the DCIU status (see Table 64).

    >   Field 11 shows the number of failures. If there are no failures, field 11 contains a 0.

    If there are no alarms, the switch turns on the green LEDs on circuit packs TN405, TN406, and UN156.

    When the test is complete WAIT disappears from your screen.

    If there are any failures, the switch lights the red LED on the circuit pack that failed and the following appears.

    >   Fields 2-6 show the equipment location.

    >   Fields 5 and 6 may be dashed if a specific DCIU circuit pack or data link cannot be identified for the fault code in field 12.

    >   Field 9 shows the DCIU status (see Table 6-4).

    >   Field 10 shows the data link status (see Table 6-5).

    >   Field 11 shows which failure you are currently viewing.

    >   Field 12 shows the fault code (see Table 6-6). Record this number.

2. Enter nc to see each alternate circuit packs to replace.

    The switch turns off the red LED on the original circuit pack and turns on the red LED on alternate circuit pack.

3. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 19 before you replace any circuit packs.

4. If this is not the last alternate circuit pack, repeat steps 2-4.

    After you view all alternate circuit packs, the switch dashes fields 2-6. If you enter nc again, the original circuit pack appears.

5. Enter `nf` to see each failure.

   The number in field 11 decreases by one as you view each failure.

6. If this is not the last failure, repeat steps 2-6.

   After you view all failures, the switch dashes all fields except field 9. If you enter `nf` again, the first failure appears.

   When all DCIU circuits pass, the switch turns off **APPL PROCR AP INTER, MAJOR, MINOR,** or **WARNING** on the common-control alarm panel if there is no other reason for it to be on. The switch marks DCIU alarms resolved. MAJOR disappears from your screen if there is no other reason for it to be on.

7. If you want to initialize the DCIU, go to *To Initialize the DCIU.*

8. If you want to examine the DCIU failure history log, go to test 1.

9. If you want to test the DCIU with a data link loopback test, go to test 3.

To Initialize the DCIU

To initialize the DCIU you must first busy it out and then release it from busy.
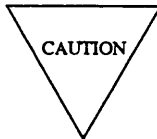
CAUTION   Do not busy out the DCIU if `WAIT` is on your screen.

1. Enter `bo bo` to busy out the DCIU.

   Special error code 80 may appear briefly in the message line.

   `WAIT` appears on your screen.

   Field 9 contains a 2 when you busy out the DCIU (see Table 6-4).

2. Enter `rb` to release the DCIU from busy.

   Field 9 contains a 0 when you release the DCIU from busy (see Table 6-4).

   If special error code 85 appears, the DCIU was not initialized. Try again.

   If special error code 87 appears, enter `bo` to busy out the DCIU. Use test 3 to find why the data link failed.

3. If you want to examine the DCIU failure history log, go to test 1.

4. If you want to test the DCIU with a data link loopback test, go to test 3.

Test 3 - Operation

Use test 3 to test a data link continuously.

In test 3 you can:

View the test 3 screen   *page 6-11*

Test a data link continuously   *page 6-12*

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    ● To start the procedure enter `p650`

    ● If you are already in the procedure, but not in test 3, enter `t3`

    The test 3 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 650, TEST: 3
            CONTINUOUSLY TEST THE DCIU WITH A LOOP-BACK TEST

EQUIPMENT LOCATION
    2.     Module:  ☐
    3.    Cabinet:  ☐
    4.    Carrier:  ☐
    5.       Slot:  ☐
    6. Data Link:   ☐

 7. Loop-back Type:  ☐

STATUS
    8.    Alarm Status:  ☐
    9.     DCIU Status:  ☐
   10. Data Link Status: ☐

LOOP-BACK TEST RESULTS
   13. Failures Per 1000 Bits:  ☐
   14. Thousands of Bits Sent:  ☐

Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▭
│_____││_____││F3 DATA ││_____││F5 HELP ││F6 FIELD ││F7 INPUT ││F8 CMDS │
```

Fields 2-6 show the equipment location of the default data link.

Field 7 contains a 0 (see Table 6-2).

Field 9 shows the DCIU status (see Table 6-4).

Field 10 shows the data link status (see Table 6-5).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Data Link Continuously

There are two types of loopback tests, an internal loopback test and an external manual loopback test. Use an internal loopback test to test the UN 156 circuit pack. Use the external manual loopback test to isolate problems between the DCIU and the peripheral.

Always do an internal loopback test first. Then do the external loopback test if you need to isolate a data link problem. Note that you can only do an internal loopback test on the off-line DCIU data link.

1. To select a data link, enter `nc` until the data link you want to test appears.

    Field 6 shows all eight data links sequentially.

2. To do the external manual loop-back tests, install the loopback adapter.

    Refer to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) if you do not know how to install a loopback adapter.

3. Enter `bo bo` to busy out the data link.

    Special error code 80 may appear briefly in the message line.

4. Enter `x` to do the loopback test.

    Fields 2-6 show the equipment location of data link you are testing.

    Field 7 shows the loopback test type (see Table 6-2).

    Field 9 shows the DCIU status (see Table 6-4).

    Field 10 shows the data link status (see Table 6-5).

    Field 13 shows the number of frames with failures. The switch sends 1000 bits per frame. This switch updates this field after every 2 frames (2000 bits).

    Field 14 shows the thousands of bits sent. Multiples of 10 appear in field 14. The switch updates this field after every 2 frames (2000 bits).

It takes about 90 seconds to send 10,000 bits.

5. If you are testing from the on-line common control, wait about 15 minutes and then enter s

It takes about 15 minutes to send about 100,000 bits. You should send about 100,000 bits to test the data link completely.

Field 13 shows the number of bits sent. If field 14 contains a number greater than 100, there is more than 1 failure per 100,000 bits sent and the data link failed the loopback test.

The switch lights the red LED on UN156 if there were any failures. If the threshold is not exceeded, the test passed. If the threshold is exceeded, the test failed.

6. If you are testing from the off-line common control, wait about 3 hours and then enter s

If you are testing from the off-line common control, you should send about one million bits. It takes about 2 and 1/2 hours to send one million bits.

Failure rate (field 13) should be less than 1 per 100,000 bits sent (field 14 contains a 100). If field 14 is less than 1000 and field 13 is less than 10 the results are not conclusive.

You can use a local loopback plug (ED1E422-10 Group 6) to find the DCIU hardware integrity up to the point of loopback.

It takes about 32 seconds to find out whether the DCIU hardware up to the loopback plug is working.

The failure rate (field 13) should be 1 or less per 4000 bits sent (field 14 contains a 4).

If no failures occur after 10,000 bits are sent (field 14 contains a 10), the green LED on UN156 is turned on. If a failure is detected (before or after 10,000 bits are sent), the red LED on UN156 is turned on and the green LED (if lighted) is turned off.

The failure rate in field 13 should be less than 1 per 100,000 bits sent.

If field 14 is less than 1000 and field 13 is less than 10, the test results are not conclusive.

7. If the link is looped back at its remote end, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 19.

8. Enter rb to release the DCIU data link from busy.

Field 9 contains a 0 when you release the data link (see Table 6-4).

If special error code 82 appears, check the translation. If special error code 87 appears, enter bo to busy out the DCIU.

9. Go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 19.

10. If you want to examine the DCIU failure history log, go to test 1.

11. If you want to test all DCIU circuit packs, go to test 2.

Special Error Codes

While using Procedure 650 you may see the following special error codes:

- `80=Enter` **bo** `twice to busy out.`

- `81=Busy out the data link before you run test 3.`

- `82=Untranslated data links cannot be busied out or released from busy.`

- `83=You can only do an internal DCIU loopback test on the off line common control.`

- `84=There are no alarms present.`

    You tried to clear alarms but there are no alarms in the DCIU failure history log.

- `85=DCIU initialization failed, try again.`

    You tried to initialize the DCIU but the DCIU was not initialized. Check the status in field 9 and try again.

- `86=Could not communicate with the DCIU.`

- `87=Restore maintenance busy; data links failed.`

    Enter bo to busy out the DCIU and test the data link in test 3.

TABLE 6-2

Field 7 Loop-Back Type
0 = Internal
1 = External manual
2 = External automatic

TABLE 6-4

Field 9 DCIU Status
0 = On-line and not busied out
1 = Off-line and not busied out
2 = On-line and busied out
3 = Off-line and busied out

TABLE 6-3

Field 8 Alarm Status
0 = No Errors
1 = Major
2 = Minor
3 = Warning
4 = Errors recorded
5 = Alarm resolved

TABLE 6-5

Field 10 Data Link Status
0 = Translated and operational
1 = Translated and busied out
2 = Untranslated

Procedure Fields

The fields listed below are data entry fields.

- In test 3 you can select a specific data link in field 6.
- In test 3 you can select the loop-back test type in field 7.

The meaning of the fields are as follows:

2-6.	EQUIPMENT LOCATION	Shows the equipment location of the DCIU circuit.
7.	Loop-back Type	Shows the type of loopback test. There are two types of loopback tests, an internal loopback test and an external manual loopback test. Use an internal loopback test to test the UN156 circuit pack. Use the external manual loopback test to isolate problems between the DCIU and the peripheral. Table 6-2 shows the loopback type encodes.
8.	Alarm Status	Shows the alarm status of a DCIU circuit. Table 6-3 shows the alarm status encodes.
9.	DCIU Status	Shows the on-line or off-line and maintenance busy status of the DCIU circuit. Table 6-4 shows the DCIU status encodes.
10.	Data Link Status	Shows the translation status of the DCIU data link. Table 6-5 shows the data link status encodes.
11.	PMIDS or DMIDS Failure Index	Shows which failure you are viewing. In test 1 the failure index is for PMIDS. In test 2 the failure index is for DMIDS.
12.	Fault Code	In test 1 shows the specific hardware or software component that failed. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems. In test 2 and 3 shows the fault code for the DCIU circuit that failed. Table 6-6 shows the fault code encodes.
13.	Failures Per 1000 Bits	Shows the number of frames with failures. The switch sends 1000 bits per frame. During the test the switch updates this field after every 2 frames (2000 bits). There should be less than 1 failure per 100,000 bits sent (1 per 100 in field 14). If field 14 is less than 1000 and field 10 is less than 10 test results are not conclusive.
14.	Thousands of Bits Sent	The switch updates this field after every 2 frames (2000 bits). Multiples of 10 appear in field 14. There should be less than 1 failure per 100,000 bits sent; 1 per 100 in field 14. If Field 14 is less than 1000 and field 10 is less than 10 test results are not conclusive.

TABLE 6-6

Field 12 Fault Code	
1 = Shutdown bit detected maintenance register	24 = Translation error
2 = Red LED on TN406 maintenance register	25 = Memory mapper error
3 = TN405 unhealthy maintenance register	26 = Protocol timer audit
4 = UN156 unhealthy maintenance register	27 = RAM parity check/generator
5 = No failures in maintenance register, status control RAM not good	28 = Memory access
6 = Status control RAM indicts assigned DL	29 = Write protect register audit
7 = Status control RAM indicts unassigned DL	30 = Write protect register test
8 = Status control RAM indicts 8086, DPROM, memory mapper, or firmware	31 = HDLC receive
9 = Status control RAM indicts local RAM	32 = HDLC transmit
10 = Status control RAM indicts 501CC interface	33 = SABMS (Set asynchronous balanced mode)
11 = Status control RAM indicts DCIU I/O	34 = Retransmit frames
12 = GOTB indicates shutdown by nothing else	35 = Loopback test error rate (off-line only)
13 = System bus time out	36 = Initialization failed
14 = Single byte parity error	37 = Mailbox request failed
15 = Double byte parity error	38 = INIT B shutdown DCTU
16 = Write protect violations	39 = Procedure 650 exited with DCTU busy
17 = RAM parity error	40 = System I/O error
18 = Sanity time out	41 = Counter request failed
19 = Local bus time out	42 = Initiation failed and stopping DT test failed
20 = Occupancy less than 9000	43 = State vector send failed
21 = Occupancy less than 4500	44 = Unhealthy but no failures in status control RAM
22 = Primary queue error	45 = ID chip failure
23 = Secondary queue error	46 = Parity command failure

PROCEDURE 651 - PCC TESTS

Purpose

Use Procedure 651 to examine the Processor Communications Circuit (PCC) failure history log, to resolve alarms, and to test the PCC.

Tests

Procedure 651 has three tests.

- Use test 1 to examine the PCC failure history log and to resolve alarms.

- Use test *2* to do a PCC self test and to do an internal loopback test.

- Use test 3 to do an end-to-end loopback test.

Procedure Overview

The switch logs all records through the PCC circuit pack (TN474B) to a call detail recording utility (CDRU) running on a 3B2 or 6386 computer. A CDRU is a software program that collects, stores, and optionally filters call records. Binary coded decimal (BCD) or hex-coded data, is sent serially from either of the two ports on the PCC circuit pack through a 23A Asynchronous Data Unit (ADU) to the CDRU.

You can use Procedure 651 to examine the PCC failure history log, to resolve alarms, to test the PCC circuit pack, to test the send and receive circuitry with a loopback test, and to do an end-to-end loopback test.

You may have to be at the switch site to isolate faults and install equipment to do the end-to-end loopback test. Then you can isolate link problems from the switch to the peripheral. You cannot do the end-to-end loopback test on the off-line common control.

Use test 1 to examine the PCC failure history log. Use test 2 to do an internal loopback test and to test the send and receive circuitry. Use test 3 to do an external end-to-end loopback test.

You may need the following test equipment in test 3 so you can better isolate failures between the PCC circuit pack and the peripheral.

TABLE 6-7

Suggested Test Equipment		
Quantity	**Description**	**Comcode**
1	EDlE422-Group 10, 11 or 12 loop back plug	
1	Single pair 5-foot patch cord	103908349 or equivalent
1	EDlE422-Group 7, RS232 loop back plug	
1	2012D transformer	102600517
1	400B adapter	104152558
1	248D adapter	102802103
1	7-foot 8-terminal modular cable (2725- 16G or equivalent)	
1	7-foot 6-terminal D6AP-87 power cord	102938620

Test 1 - Operation

In test 1 you can:

View the test 1 screen	
Examine the PCC failure history log	
Resolve alarms	

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter t1

   - Otherwise, enter p651

   The test 1 screen similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 651, TEST: 1
                  EXAMINE THE PCC FAILURE HISTORY LOG

EQUIPMENT LOCATION
   2. Carrier: ▢
   3.   Slot : ▢
   4. Circuit: ▢

   6.        Alarm Status: ▢
   8.        Failure Index: ▢
   9. Specific Fault Code: ▢











Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the PCC Failure History Log

1.   Enter x to sort the PCC failure history log.

     The switch loads the first six failures into the failure buffer.

     Field 8 shows the number of failures. If there are no failures, field 8 contains a 0.

2.   Enter nc to see each failure.

     Fields 2-4 show the equipment location of the PCC circuit.

     Field 6 shows the alarm status (see Table 6-9).

     Field 8 shows which of the six failures you are viewing. The number in field 8 decreases by one as you view each failure.

     Field 9 shows the specific fault code. Record this number.

     After you view all failures, the switch dashes all fields. If you enter nc again, the summary appears.

3.   If there is a failure, go to test 2 and test the PCC circuit that failed.

4.   If this is not the last failure, repeat steps 1-4.

5.   If you want to resolve alarms, go to *To Resolve Alarms.*

6.   If you want to do a self test or a loopback test, go to test 2.

7.   If you want to do an end to end loopback test, go to test 3.

To Resolve Alarms

1. If you want to resolve all alarms, make sure that the summary is on your screen.

   If the summary is not on your screen, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter nc until the alarm you want to resolve appears.
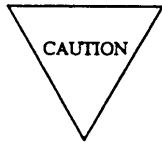
   ▽ CAUTION Record all PCC failures and their specific fault codes before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

   Field 6 shows a 5 if you resolved a single alarm (see Table 6-9).

   Field 8 shows the number of failures in the log.

   If you resolved all alarms, the switch marks all major, minor, and warning alarms resolved. The switch turns off **OTHER FAILS, MAJOR, MINOR,** or **WARNING** on the common-control alarm panel if there is no other reason for them to be on.

4. If you want to do a self test or a loopback test, go to test 2,

5. If you want to do an end to end loopback test, go to test 3.

Test 2 - Operation

Use test 2 to do a PCC self test and to do an internal loopback test.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    ● To start the procedure, enter `p651`

    ● If you are already in the procedure, but not in test 2, enter `t2`

      The test 2 screen, similar to the following, appears.

```
                    ENHANCED MODE  -  PROCEDURE: 651, TEST: 2
                    TEST THE PCC WITH AN INTERNAL LOOPBACK TEST


 EQUIPMENT LOCATION
    2. Carrier: ▢
    3.    Slot: ▢
    4. Circuit: ▢

  6.              Alarm Status: ▢
  7.             Circuit Status: ▢
  8. Specific Fault Code Index: ▢
  9.     Specific Fault Code: ▢











 Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |


 enter command: ▬
 |_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

Fields 2-4 may show a default equipment location from test 1 or 3, or from Procedure 600 Test 1 or 2.

Fields 6 and 7 may show the alarm and circuit status of the default circuit.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a PCC Circuit
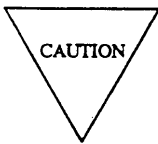
CAUTION   When you busy out a PCC circuit the switch blocks messages to the CDRU.

1. To select a PCC circuit choose one of the following:
   - Enter cf2 and then enter the carrier, slot, and circuit.
   - Enter nc until the PCC circuit you want to test appears.
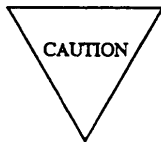
CAUTION   When you busy out a PCC circuit you cannot use Procedure 635 to release the PCC circuit from busy.

2. If field 7 contains a 2, enter bo bo to busy out the PCC circuit.

   Special error code 80 appears briefly in the message line. You must enter bo two times to busy out a PCC circuit.

   Field 7 contains a 1 (see Table 6-10).

3. Enter x to test a PCC circuit.

   WAIT appears on your screen.

      Field 7 changes from 1 to a 3 (see Table 6-10). If you did not busy out the circuit, special error code 81 appears in the message line.

      After the test, WAIT disappears from your screen.

      If the PCC circuit passes field 8 contains a 0 and field 6 shows the alarm status. The switch lights the green LED on the TN474B circuit pack. The switch marks PCC alarms resolved. The switch turns off **OTHER FAILS, MAJOR, MINOR,** or **WARNING,** on the common-control alarm panel if there is no other reason for them to be on.

      If the PCC circuit fails, the following appears.

         Fields 2-4 show the equipment location of the PCC circuit.

         Field 6 shows the alarm status (see Table 6-9).

         Field 7 contains a 1 (see Table 6-10).

         Field 8 shows the number of specific fault codes recorded.

      The switch lights the red LED on the TN474B circuit pack.

4. Enter nf to view other specific fault codes.

      Field 8 shows the number of specific fault codes recorded.

      Field 9 shows the specific fault code. Record all specific fault codes for each failure.

5. If this is not the last specific fault code, repeat steps 4 and 5.

   After you view all specific fault codes, the switch dashes field 9. If you enter nf again, the first specific fault code appears in field 9.

6. If the PCC circuit failed, go to *DEFINITY*™ *Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 77.

7. Enter rb to release the PCC circuit from busy.

      Field 7 contains a 2 (see Table 6-10).

8. If you want to examine the PCC failure history log or resolve alarms, go to test 1.

9. If you want to do an end to end loopback test, go to test 3.

Test 3 - Operation

Use test 3 to do an external PCC end-to-end loopback test.

In test 3 you can:

To View the 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    ● To start the procedure, enter `p651`

    ● If you are already in the procedure, but not in test 3, enter `t3`

       The test 3 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 651, TEST: 3
                   TEST THE FCC WITH AN END-TO-END LOOPBACK TEST


EQUIPMENT LOCATION
    2. Carrier: □
    3.    Slot : □
    4. Circuit: □

  5.                Test Length: □
  6.               Alarm Status: □
  7.             Circuit Status: □
  8.              Failure Index: □
  9.         Specific Fault Code: □
 10.     Number of Failed Messages: □
 11. Number of Attempted Messages: □






Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT

enter command: ▄
┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐
│        ││        ││F3 DATA ││        ││F5 HELP ││F6 FIELD││F7 INPUT││F8 CMDS │
```

Fields 4-6 may contain a default equipment location from tests 1 or 2 or from Procedure 600 Test 1 or 2.

Fields 6 and 7 show the alarm status and circuit status of the default equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do an External Loopback Test
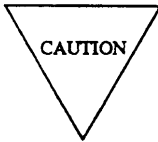
When you busy out PCC circuit the switch blocks messages to the CDRU.

1. Make sure that the CDRU is connected and is operational.

2. To select a PCC circuit, do one of the following:

   ● Enter cf2 and then enter the carrier, slot, and circuit.

   ● Enter nc until the PCC circuit, you want to test appears.

3. If field 7 contains a 2, enter bo bo

   Special error code 80 appears briefly in the message line.

   You must enter busy out two times to busy out a PCC circuit.

   Field 7 contains a 1 when you busy out the PCC circuit (see Table 6-10).
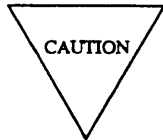
   When you busy out a PCC circuit you cannot use Procedure 635 to release the PCC circuit from busy.

4. To select the test length choose from the following:

   ● To test the PCC circuit once, enter cf5 and enter a 0 in field 5.

   ● To test the PCC circuit continuously, enter c f 5 and enter a 1.

5. Enter x to test a PCC circuit.

   WAIT appears on your screen.

   If you did not busy out the circuit, special error code 81 appears in the message line.

   If you try to run test 3 in the off-line common control, special error code 83 appears in the message line.

   During the test, the following fields change.

   Fields 2-4 show the equipment location.

Field 5 shows the test length (see Table 6-8).

Field 7 shows the circuit status (see Table 6-10).

Field 8 shows the failure index.

Field 9 shows the specific fault code.

Field 10 shows the number of failed messages.

Field 11 shows the number of attempted messages.

The switch updates field 10 and 11 about once every second.

If you selected a continuous test, field 7 changes from 1 to a 3. The switch tries to send up to 999 messages. After 999 attempts, the test stops. Field 11 contains a 999 and the data in fields 10 and 11 is frozen.

6. After about 100 messages are sent, enter s

It takes about 100 messages to test the PCC circuit completely.

If the PCC circuit passes fields 8 and 10 contain a 0.

If the PCC circuit failed, the following appears.

Fields 2-4 show the equipment location.

Field 5 shows the test length (see Table 6-8).

Field 6 shows a alarm status (see Table 6-9).

Field 7 contains a 1 (see Table 6-10).

Field 9 shows the specific fault code. There may be more than one specific fault code for the failure.

Field 10 shows the number of failed messages.

Field 11 shows the number of attempted messages.

7. Enter nf to view other specific fault codes.

Field 8 shows the number of specific fault codes for the failure.

Field 9 shows the specific fault code. Record all specific fault codes for the failure.

After you view all specific fault codes, the switch dashes field 9. If you enter nf again, the first specific fault code appears in field 9.

8. If the PCC circuit fails, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 77.

9. Enter rb to release the PCC circuit.

10. If you want to examine the PCC failure history log or resolve alarms, go to test 1.

11. If you want to do a self test or a loopback test, go to test 2.

Special Error Codes

While using Procedure 651 you may see the following special error codes:

- 80= Enter **bo** twice to busy out a PCC circuit .

  You tried to busy out a PCC circuit. Check whether you want to busy out the PCC circuit. Enter bo again if you want to busy out the PCC circuit.

- 81=Busy out the circuit before you do this test.

  You tried to test a PCC circuit, in test 2 or 3, and the circuit was not already busied out. Busy out the PCC circuit and try again.

- 82= The circuit is not translated for the BTC protocol .

  Check translation with Procedure 255 Word 2.

- 83=You cannot do test 3 in the off-line processor.

  You tried to run test 3 in the off-line common control. Switch to the on-line common control and try again.

- 84=Busy out failed; cannot communicate with the TN474B.

  You tried to busy out a PCC. Try again. If this special error code appears again, there maybe an I/O problem.

TABLE 6-8

Field 5 Test Length		
0	=	Single test
1	=	Continuous test

TABLE 6-10

Field 7 Circuit Status		
0	=	Circuit not translated
1	=	Circuit maintenance busied
2	=	Circuit online and operational
3	=	Circuit currently in test
4	=	Circuit not operational
5	=	Circuit offline and operational

TABLE 6-9

Field 6 Alarm Status		
0	=	No errors recorded
1	=	Major
2	=	Minor
3	=	Warning
4	=	Errors recorded
5	=	Alarm resolved

Procedure Fields

The fields listed below are data entry fields.

- In test 2 and 3 you can enter the equipment location of a PCC circuit in fields 2-4.

- In test 3 you can select whether you will test once or continually by changing the number in field 5.

The meaning of the fields are:

2-4.	EQUIPMENT LOCATION	Shows the equipment location of the TN474B circuit pack.
5.	Test Length	Shows whether you want to do a single test or a continuous test. Table 6-8 shows the test length encodes.
6.	Alarm Status	Shows the alarm status of the PCC circuit. Table 6-9 lists the alarm status encodes.
7.	Circuit Status	Shows the translation and maintenance busy status of the circuit. Table 6-10 lists the circuit status encodes.
8.	Specific Fault Code Index or Failure Index	Initially shows the number of specific fault codes recorded. If the number in this field is greater than one, the switch recorded more than one specific fault code for the failure.
9.	Specific Fault Code	Shows the specific hardware or software component that failed. Specific fault codes help to diagnose hardware and software problems. Record this number, it will be useful to those who diagnose switch software problems.
10.	Number of Failed Messages	Shows the number of messages that failed.
11.	Number of Attempted Messages	Shows the number of messages that the switch attempted to send through the PCC circuit.

PROCEDURE 652 - HARDWARE AND SOFTWARE TIME-OF-DAY CLOCK TESTS

Purpose

Use Procedure 652 to examine the time-of-day clock failure history log, to resolve alarms, to test the hardware and software time-of-day clock, to set the hardware clock, and to set the software clock equal to the hardware clock.

Tests

Procedure 652 has three tests.

- Use test 1 to examine the clock failure history log and to resolve alarms.

- Use test 2 to test the hardware time-of-day clock continuously.

- Use test 3 to set the hardware and software time-of-day clocks.

Procedure Overview

Use Procedure 652 to test the hardware and software clocks in the switch. The switch uses the hardware and software clocks to record calls or failures in the switch. In the DEFINITY Generic 2 the clock is on the remote interface circuit pack.

Use test 1 to examine the maintenance busy status and alarm status of the time-of-day clock synchronizer. Use test 2 to see if the hardware time-of-day clock changed since last read, and if the time and date are within logical limits. Use test 3 to set the time-of-day clock synchronizer to the correct time-of-day, and synchronize the software clock to the hardware clock.

Test 1 - Operation

Use test 1 to examine the time-of-day clock failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    - If you are already in the procedure but not in test 1, enter `t1`

    - Otherwise, enter `p652`

      The test 1 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 652, TEST: 1
              EXAMINE THE TIME-OF- DAY CLOCK FAILURE HISTORY LOG


EQUIPMENT LOCATION
   2. Carrier: ▢
   3.    Slot: ▢

 4. Maintenance Busy Status: ▢
 5.           Failure Code: ▢

FAILURE HISTORY
 13.              Failure Index: ▢
 14. Number of Failures Per Hour: ▢
 15.  Hours Since Failures Began: ▢






Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |
────────────────────────────────────────────────────────────────────────────────
enter command: ▃
|_____||_____|| F3 DATA ||_____|| F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS |
```

Fields 2 and 3 show the equipment location of the time-of-day clock synchronizer.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Time-of-Day Clock Failure History Log

1. Enter x to sort the time-of-day clock failure history log.

    The test does not busy out the hardware time-of-day clock synchronizer.

    > Fields 2 and 3 show the equipment location of the hardware time-of-day clock synchronizer.

    > Field 4 shows the maintenance busy status and the alarm severity (see Table 6-11).

    > Field 13 contains a 0 (see Table 6-14).

    > Fields 14 and 15 show the failure summary. If there are no failures, field 14 contain a 0.

2. Enter nd to see each failure.

    The failure code with the most failures appears first. The switch loads the first six failures into to the failure buffer.

    > Field 4 shows the maintenance busy status and the alarm severity (see Table 6-11).

    > Field 5 shows the failure code (see Table 6-12).

    > Field 13 shows which failure you are viewing (see Table 6-14). The number in field 13 increases by one as you view each alarm.

    > Fields 14 show the number of failures per hour.

    > Field 15 shows when the failure first occurred.

3. Go to test 2 and test each circuit that failed.

4. If there are more entries in the log, repeat steps 2-4.

    After you view all failures, the switch dashes fields 4-15. If you enter nd again, an updated failure summary appears.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to test the time-of-day clock circuit and software buffers continuously, go to test 2.

7. If you want to set the hardware and software time-of-day clocks, go to test 3.

To Resolve Alarms

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nd until the alarm you want to resolve appears.

2. If you want to resolve all alarms, make sure that the summary is on your screen.

    Enter x to see the summary.
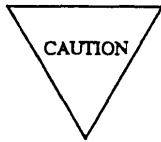
    ▽ CAUTION   Record all alarms and all failure codes for each alarm before you resolve them. Then you will have a failure history you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

    Field 14 shows the total number of alarms in the log. If you resolve all alarms, field 14 contains a 0.

    The switch marks the hardware time-of-day clock synchronizer alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

4. If you want to test the time-of-day clock circuit and software buffers continuously, go to test 2.

5. If you want to set the hardware and software time-of-day clocks, go to test 3.

Test 2 - Operation

Use test 2 to test the time-of-day clock continuously.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter `p652`

   - If you are already in the procedure but not in test 2, enter `t2`

     The test 2 screen, similar to the following, appears.

```
               ENHANCED MODE - PROCEDURE: 652, TEST: 2
                 CONTINUOUSLY TEST THE HARDWARE TIME-OF-DAY CLOCK


EQUIPMENT LOCATION
   2. Carrier: ☐
   3.    Slot: ☐


 4. Maintenance Busy Status: ☐
 5.           Failure Code: ☐
 6.         Hardware Clock: ☐

TIME STAMP
   7.   Month: ☐
   8.     Day: ☐
  10.   Hours: ☐
  11. Minutes: ☐
  12. Seconds: ☐




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▄
[_____][____][F3 DATA][____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test the Hardware Time-of-Day Clock Continuously

1. Enter x to test the hardware time-of-day clock continuously.

    Fields 7, 8, and 10-13 show the time and date generated by the hardware time-of-day clock.

    If the battery in the hardware clock does not work, the test will fail.

2. Enter s to stop the test.

    Fields 2 and 3 show the equipment location of the hardware time-of-day clock synchronizer.

    Field 4 shows the maintenance busy status and the alarm severity (see Table 6-11).

    Field 5 shows the failure code (see Table 6-12). If there are no failures, field 5 contains a 0.

    Field 6 contains a 1 (see Table 6-13).

    Fields 7, 8, and 10-12 show the time of the hardware clock, when you entered s

3. Enter nd to see other failure codes.

    Field 5 shows the failure code (see Table 6-12). Record this number.

4. If a failure code other than 5 appears, go to *DEFINITY™ Communications System Generic 2 Maintenance Procedures* (555-104-118) and follow the repair steps for unit type 38.

    Failure code 5 is not an alarm condition and therefore does not require repair.

    After you repair all failures, the switch marks hardware time-of-day clock synchronizer alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

    If the hardware time-of-day clock synchronizer was busied out and was passing test 2 when the test stopped, the switch releases it from busy.

5. If there are more entries in the log repeat steps 2-5.

6. If you want to see alarms or resolve alarms, go to test 1.

7. If you want to set the hardware and software time-of-day clocks, go to test 3.

Test 3 - Operation

Use test 3 to set the hardware or software time-of-day clock for the on-line processor.

In test 3 you can:

View the test 3 screen	*page 6-39*
Set the hardware and software time-of-day clocks	*page 6-40*

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    • To start the procedure, enter `p652`

    • If you are already in the procedure but not in test 3, enter `t3`

    The test 3 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 652, TEST: 3
              SET THE HARDWARE AND SOFTWARE TIME-OF-DAY CLOCKS

EQUIPMENT LOCATION
   2. Carrier: ▢
   3.    Slot : ▢

 4. Maintenance Busy Status: ▢
 5.              Failure Code: ▢
 6.               Clock Type: ▢

TIME STAMP
   7.    Month: ▢
   8.      Day: ▢
   9.     Year: ▢
  10.    Hours: ▢
  11.  Minutes: ▢
  12.  Seconds: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[       ][      ][F3 DATA ][       ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Set the Hardware and Software Time-of-Day Clocks

When you replace the hardware time-of-day clock, set the hardware and software clocks.

1. Enter x to view the hardware clock time.

> Fields 2 and 3 show the equipment location of the hardware time-of-day clock.

> Field 4 shows the maintenance busy status and the alarm severity (see Table 6-11).

> Field 6 shows a 0 while you are viewing the software clock, and a 1 while you are viewing the hardware clock (see Table 6-13).

> Fields 7-12 show the clock time and date. A real-time readout of the time and date appears when you are viewing the software clock.

2. Enter nu to switch between the hardware and software time-of-day clock.

> Fields 2 and 3 show the equipment location of the time-of-day clock if you are viewing the hardware clock.

> Field 4 shows the maintenance busy status and the severity of the alarm (see Table (6-11).

> Field 6 contains a 1 if you are viewing hardware time-of-day clock or a 2 if you are viewing the software clock (see Table 6-13).

> Fields 7-12 show the time and date of the clock you are viewing. The time and date appear from the software clock.

3. If the time on the software clock is correct, enter cdx to set both clocks to the same time.

   If you try to set the clock from the off-line processor, special error code 81 appears in the message line.

4. If the software clock is not correct, use the following steps to set the software time-of-day clock,

   a. Enter cf and the field number of the field that you want to change.

   b. Enter the correct data in the field.

   c. Enter cdx to enter the new software clock time.

   > The switch sets the software clock and the hardware clock to the new time and date.

   If you did not replace the hardware time-of-day clock or if failure code 6 appears in field 5, use test 2 to test the hardware time-of-day clock.

5. If you want to examine the failure history log or resolve alarms, go to test 1.

6. If you want to test a circuit or range of circuits, go to test 2.

Special Error Codes

While using Procedure 652 you may see the following special error codes:

- `74=The hardware time-of-day clock is not set.`

  You tried to examine the hardware clock, but the real time hardware clock is not set. Check translation with Procedure 284 Word 3.

- `80=Warning-after you set the clock in Test 3, run Test 2.`

  You set the clock in test 3 and you have to run test 2 to test the hardware time-of-day clock.

- `81=You cannot set the clock from the off-line processor.`

  You tried to set the hardware clock from the off-line processor. Connect to the on-line processor and then set the clock.

TABLE 6-11

Field 4 Maintenance Busy Status		
0	=	Not busied out or alarmed
1	=	Busied out but not alarmed
2	=	Alarmed but not busied out
3	=	Alarmed and busied out

TABLE 6-13

Field 6 Clock Type		
0	=	Software
1	=	Hardware

TABLE 6-12

Field 5 Failure Code		
0	=	No failures
1	=	No response
4	=	No change since last read
5	=	Software update after initialization
6	=	Small difference between hardware and software clock
7	=	Large difference between hardware and software clock
8	=	Invalid time values from hardware
9	=	Invalid time values from software
10	=	Clock set failure

TABLE 6-14

Field 13 Failure Index		
0	=	Failure summary
1-6	=	Index into failure history

Procedure Fields

The fields listed below are data entry fields.

- In test 3 you can set the time and date of the software or hardware time-of-day clocks in fields 7-12.

The meaning of the fields are:

2-3.	EQUIPMENT LOCATION	Shows the equipment location of the hardware time-of-day clock circuit.
4.	Maintenance Busy Status	Shows the maintenance busy status of the hardware time-of-day synchronizer.
5.	Failure Code	Shows why the hardware or software clock failed. If there is a large difference between the hardware and the software clocks, the software clock is assumed correct.
6.	Hardware Clock or Clock Type	Shows whether you are viewing the hardware clock or the software clock.
7-12.	TIME STAMP	Shows the time and date reported from the hardware clock. The hour appears using a 24-hour clock.
13.	Failure Index	Shows which failure you are viewing. The failure summary appears first. Then, up to six failures appear.
14.	Number of Failures Per Hour	When you are viewing the failure summary (field 13 contains a 0) field 14 shows the number of failures per hour for all failures. When you are viewing the failure history, field 14 shows the number of failures per hour for the failure code on your screen.
15.	Hours Since Failures Began	Shows the number of hours since the oldest failure code. When you are viewing an individual failure history, field 15 shows the number of hours since the failures started for the failure code on your screen.

PROCEDURE 653 - ATTENDANT CONSOLE TESTS

Purpose

Use Procedure 653 to examine the attendant console failure history log, to resolve alarms, and to test attendant consoles.

Tests

Procedure 653 has 3 tests.

- Use test 1 to examine the attendant console failure history log and to resolve alarms.

- Use test 2 to test all attendant consoles in the switch.

- Use test 3 to test a single attendant console continuously.

Procedure Overview

Attendant console failures appear during call processing and are not detected by periodic tests.

Use Procedure 611 Test 2 to test all attendant console dual-speed data channels.

Test 1 - Operation

Use test 1 to examine the attendant console failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen choose one of the following:

    - If you are already in the procedure, but not in test 1, ener t1

    - Otherwise, enter p653

      The test 1 screen, similar to the following, appears.

```
           ENHANCED MODE - PROCEDURE: 653, TEST: 1
          EXAMINE THE ATTENDANT CONSOLE FAILURE HISTORY LOG


  EQUIPMENT LOCATION
     2. Carrier: ▢
     3.    Slot: ▢
     4. Channel: ▢


   5.      Console Number: ▢
   6.     Location Status: ▢
   7.        Failure Code: ▢
   8. Number of Consoles: ▢
   9. Number of Failures: ▢
  10.       Failure Index: ▢


  FAILURE HISTORY
   11. Number of Failures Per Hour: ▢
   12.    Hours Since Failure Began: ▢
   13.     Hours Since Last Failure: ▢
   14.   Minutes Since Last Failure: ▢

 Connected to CC0 ON-LINE ♡  MAJOR   MINOR   RUN TAPE   BUSY OUT   IN USE   WAIT
 ──────────────────────────────────────────────────────────────────────────
 enter command: ▭
 _____  _____  F3 DATA  _____  F5 HELP  F6 FIELD  F7 INPUT  F8 CMDS
```

Field 8 shows the number of attendant consoles in the switch.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Attendant Console Failure History Log

1. Enter x to sort the attendant failure history log.

    Field 8 shows the number of consoles in the switch.

    Field 9 shows the number of console failures (the failure summary).

    Fields 10-13 contain the failure summary.

    If there are no failures, fields 9-11 contain a 0.

2. Enter nc to see each console failure.

    Fields 2-4 show the equipment location of the attendant console dual-speed data channel.

    Field 5 shows the console number.

    Field 6 shows the location status (see Table 6-15).

    Field 7 shows the failure code (see Table 6-16).

    Field 8 shows the number of consoles in the switch.

    Field 9 shows the number of data channels that failed.

    Field 10 shows which failure you are viewing. The number in field 10 increases by 1 as you view each alarm.

    Fields 11-14 show when the attendant console failed.

3. If there are any failures, go to test 3 and test the attendant console that failed.

4. If this is not the last failure repeat steps 1-4.

    After you view all failures, the switch dashes all fields except field 8. If you enter nc again, the failure summary appears.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to test all attendant consoles, go to test 2.

7. If you want to test a single attendant console continuously, go to test 3.

To Resolve Alarms

You may want to resolve invalid alarms from the attendant console failure history log.

1. If you want to resolve all alarms, make sure that the alarm summary is on your screen,

    If the alarm summary is not on your screen, enter x

2. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter x and then enter nc until the alarm you want to resolve appears.
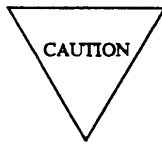
> ⚠ CAUTION
>
> Record all alarms, and their failure times, before you resolve them from the attendant console failure history log. Then you will have a failure record you can use for future troubleshooting.

3. Enter cdx to resolve alarms.

    The switch marks attendant console alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

4. If you want to test all attendant consoles in the switch, go to test 2.

5. If you want to test a single attendant console, go to test 3.

Test 2 - Operation

Use test 2 to test all attendant consoles in the switch.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   • To start the procedure, enter `p653`

   • If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 653, TEST: 2
                TEST ALL ATTENDANT CONSOLES


EQUIPMENT LOCATION
   2. Carrier:   ▢
   3.    Slot:   ▢
   4. Channel:   ▢


 5.      Console Number:  ▢
 6.     Location Status:  ▢
 7.        Failure Code:  ▢
 8. Number of Consoles:  ▢
 9. Number of Failures:  ▢
.0.       Failure Index:  ▢








Connected to CC0 ON-LINE ♡ ┌ MAJOR ┐┌ MINOR ┐┌ RUN TAPE ┐┌ BUSY OUT ┐┌ IN USE ┐┌ WAIT ┐


enter command: ▬
┌──────┐┌──────┐┌ F3 DATA ┐┌──────┐┌ F5 HELP ┐┌ F6 FIELD ┐┌ F7 INPUT ┐┌ F8 CMDS ┐
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test All Attendant Consoles

1. Make sure that you have the handsets and headsets plugged into each attendant consoles.
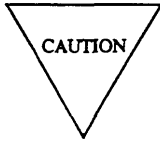
CAUTION   If the handsets and headsets are not plugged in, the console will fail.

2. Enter x to test all attendant consoles.

   WAIT appears on your screen as the switch tests each console.

   When the test is done WAIT disappears from your screen.

   Field 9 shows the number of failures. If there are no failures, field 9 contains a 0.

3. Enter nc to see each failure.

   Fields 2-4 show the attendant console dual-speed data channel equipment location.

   Field 5 shows the console number.

   Field 6 shows the location status (see Table 6-15).

   Field 7 shows the failure code (see Table 6-16).

   Field 8 shows the number of consoles in the switch.

   Field 9 shows the number of data channels that failed.

   Field 10 shows which failure you are viewing. The number in field 10 increases by 1 as you view each failure.

4. If an attendant console fails, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 17.

5. If this is not the last failure repeat steps 3-5.

   After you view all attendant console failures, the switch dashes all fields except field 8. If you enter nc again the summary appears.

   When all consoles pass, the switch marks the attendant console alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

6. If you want examine all attendant console failure history log or to resolve alarms, go to test 1.

7. If you want to test a single attendant console, go to test 3.

Test 3 - Operation

Use test 3 to test a single attendant console continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   ● To start the procedure, enter `p653`

   ● If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 653, TEST: 3
         CONTINUOUSLY TEST A SINGLE ATTENDANT CONSOLE


EQUIPMENT  LOCATION
   2. Carrier:  ☐
   3.   Slot :  ☐
   4. Channel:  ☐

 5.      Console Number: ☐
 6.     Location Status: ☐
 7.        Failure Code: ☐
 8. Number of Consoles:  ☐
 9. Number of Failures:  ☐
10.       Failure Index: ☐










Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▄
[          ][        ][F3 DATA ][        ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

   The switch highlights field 2 if there are no failures in test 1 or 2.

   Fields 2-4 may contain the equipment location of a console from test 1 or 2.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test an Attendant Console Continuously

1. Enter `cf2` and then enter the carrier, slot, and data channel.

2. If you want to select an attendant console in another carrier, enter `nu` to select the I/O channel and then enter `nc` until the console you want to test appears.

3. Make sure that you have the handset and headset plugged into the attendant console you want to test.
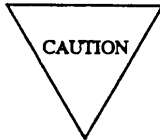
CAUTION If the handsets and headsets are not plugged in the console will fail.

4. Enter `x` to test the attendant console.

    Fields 2-4 show the attendant console dual-speed data channel equipment location.

    Field 5 shows the console number.

    Field 6 shows the location status (see Table 6-15).

    Field 7 shows the failure code (see Table 6-16).

    Field 8 shows the number of consoles in the switch.

5. After a few minutes enter `s`

    If the test passed field 7 contains a 0. If field 7 contains any other number, the test failed.

6. If the attendant console failed, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 17.

7. If you want to test another console, repeat steps 1-7.

8. Do test 2 so the switch can turn off the attendant console alarm.

TABLE 6-15

Field 6 Location Status		
0	=	Local
l	=	Remote

TABLE 6-16

Field 7 Failure Code		
0	=	No failures
l	=	Failed on-line periodic tests
4	=	Addressing problem
5	=	No echo from console

Procedure Fields

The fields listed below are data entry fields.

- In test 3 you can select a specific console in fields 2-4.

The meaning of the fields are:

2-4.	EQUIPMENT LOCATION	Shows the equipment location of the dual-speed data channel.
5.	Console Number	Shows which attendant console you are currently viewing.
6.	Location Status	Shows where the console is located. A remote console can be located up to 15000 feet from the common control. Table 6-15 shows the location status encodes.
7.	Failure Code	Shows why the attendant console failed. Table 6-16 shows the failure code encodes.
8.	Number of Consoles	Shows the number of consoles in the cabinet on your screen.
9.	Number of Failures	Shows the number of attendant consoles that failed.
10.	Failure Index	Shows which console failure you are viewing (up to six).
11.	Number of Failures Per Hour	When field 10 contains a 0, the sum of the approximate number of failures per hour appears. When field 10 shows a failure index, the number of failures per hour for the failure on your screen appears.
12.	Hours Since Failures Began	When field 10 contains a 0 the number of hours since the oldest recorded failure appears. When field 10 shows a failure, the number of hours since the failure began appears.
13.	Hours Since Last Failure	When field 10 contains a 0, the most recent failure of any circuit appears. When field 10 shows a failure, the most recent failure for the circuit on your screen appears.
14.	Minutes Since Last Failure	When field 10 contains a 0, the most recent failure of any circuit appears. When field 10 shows a failure, the most recent failure for the circuit on your screen appears.

PROCEDURE 654 - DISPLAY TERMINALS TEST

Purpose

Use Procedure 654 to examine the display terminal failures history log, to resolve alarms, and to test a selected display terminal or all display terminals.

Tests

Procedure 654 has three tests.

- Use test 1 to examine the display terminal failure history log and to resolve alarms.

- Use test 2 to test all display terminals.

- Use test 3 to test a selected display terminal continuously.

Procedure Overview

Display terminals may be used with the automatic call distribution (ACD) and centralized attendant service (CAS) features to show the terminal extension or station directory number. You can use Procedure 654 to see the 102D calling number display and 102F, 102G, or 106 force administration data system (FADS) terminal failures, see the time stamp of each failure, or to test each terminal with a short data test.

You must beat the switch site, or talking to someone who can see the display terminal, to use test 3 so you can see if the digits on the display terminal are correct for test 3.

Test 1 - Operation

Use test 1 to examine the display terminal failure history log and to resolve alarms.

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    ● If you are already in the procedure, but not in test 1, enter `tl`

    ● Otherwise, enter `p654`

    The test 1 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 654, TEST: 1
                EXAMINE THE DISPLAY TERMINALS FAILURE HISTORY LOG

 2.           Terminal Type: ▢
 3. Extension or Unit Number: ▢

DATA CHANNEL EQUIPMENT LOCATION
    4. Carrier: ▢
    5.    Slot: ▢
    6. Channel: ▢

10. Number of Failures: ▢

TIME STAMP
   11.    Day: ▢
   12.   Hour: ▢
   13. Minute: ▢




Connected to CC0 ON-LINE ♡ ┌ MAJOR ┐┌ MINOR ┐┌ RUN TAPE ┐┌ BUSY OUT ┐┌ IN USE ┐┌ WAIT ┐

enter command: ▬
┌──────┐┌──────┐┌ F3 DATA ┐┌──────┐┌ F5 HELP ┐┌ F6 FIELD ┐┌ F7 INPUT ┐┌ F8 CMDS ┐
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Display Terminal Failure History Log

1. Enter x to sort the display terminal failure history log.

    The switch sorts display terminal failures by failure type. Display terminals with the most errors appear first. Calling number display terminal failures appear before FADS terminal failures.

    Field 10 shows the number of display terminal failures. If there are no failures, field 10 contains a 0.

    Fields 11-13 show the time of the first failure.

2. Enter nc to see each display terminal failure.

    Field 2 shows the terminal type (see Table 6-17).

    Field 3 shows the extension for terminal type 1 or unit number for terminal type 13.

    Fields 4-6 shows the equipment location of the display terminals dual-speed data channel.

    Field 10 shows the number of channels that failed.

    Fields 11-13 shows when the failure last occurred.

    After you view all failures, the switch dashes all fields. If you enter nc again, the summary appears.

3. Go to test 2 and test the terminal that failed.

4. If this is not the last failure repeat steps 1-4.

5. If you want to resolve alarms, go to *To Resolve Alarms.*

6. If you want to test all display terminals, go to test 2.

7. If you want to test a selected display terminal continuously, go to test 3.

To Resolve Alarms

You may want to resolve any invalid alarms from the log.

1. If you want to resolve a single alarm, make sure that the alarm is on your screen.

    If the alarm is not on your screen, enter `x` and then enter `nc` until the alarm you want to resolve appears.

2. If you want to resolve all alarms, make sure that the failure summary is on your screen.

    If the failure summary is not on your screen, enter `x`
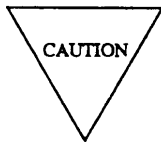
    > **CAUTION**
    >
    > Record all display alarms, and their time stamps, before you resolve them from the log. Then you will have a failure history you can use for future troubleshooting.

3. Enter `cdx` to resolve alarms.

    The switch marks display terminal alarms resolved. The switch turns off **OTHER FAILS** on the common-control alarm panel if there is no other reason for it to be on.

4. If you want to test all display terminals, go to test *2*.

5. If you want to test a selected terminal continuously, go to test 3.

Test 2 - Operation

Use test 2 to test all display terminals.

In test 2 you can:

View the test 2 screen   *page 6-59*

Test all display terminals   *page 6-60*

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    • To start the procedure, enter `p654`

    • If you are already in the procedure, but not in test 2, enter `t2`

    The test 2 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 654, TEST: 2
                       TEST ALL DISPLAY TERMINALS

  2.            Terminal Type: ▢
  3. Extension or Unit Number: ▢

DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier: ▢
   5.    Slot: ▢
   6. Channel: ▢

FAILURE CODES
   8. First Failure Code: ▢
   9.  Last Failure Code: ▢

10. Number of Failures: ▢




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT

enter command: ▄
            || F3 DATA ||        || F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS |
```

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test All Display Terminals

1. Enter x to test all display terminals.

   WAIT appears on your screen.

   The switch runs an echo test by sending data to a display terminal and waiting for a response. The switch tests all data channels stating with the first translated equipment location.

   If the switch finds a FADS (type 102F or 102G) display terminal that is in use, IN USE may stay on your screen for up to 2 minutes.

   If there are no failures, WAIT disappears from your screen and field 10 contains a 0.

   If there are any failures, WAIT disappears from your screen and the following appears.

   > Field 2 shows the terminal type (see Table 6-17).

   > Field 3 shows the extension for terminal type 1 or unit number for terminal type 13.

   > Fields 4-6 shows the equipment location of the display terminals dual-speed data channel.

   > Fields 8 and 9 shows the first and last failure codes (see Table 6-18).

   > Field 10 shows the number of failures.

2. If there is a display terminal failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 37 (CAS) or 39 **(FADS)**.

   If the test stopped because of a failure, enter nc to continue testing.

   After the switch tests all assigned display terminals, the switch dashes all fields except field 10.

3. If you want to test again, enter nc

   When all display terminals pass the switch marks display terminal alarms resolved. The switch turns off **OTHER FAILS** if there is no other reason for it to be on.

4. If you want to examine the display terminals failure history log or resolve alarms, go to test 1.

5. If you want to test a selected terminal continuously, go to test 3.

Test 3 - Operation

Use test 3 to test display terminals continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter `p654`

   - If you are already in the procedure, but not in test 3, enter `t3`

     The test 3 screen, similar to the following, appears.

```
                  ENHANCED MODE - PROCEDURE: 654, TEST: 3
                     CONTINUOUSLY TEST DISPLAY TERMINALS

 2.             Terminal Type: 🔲
 3. Extension or Unit Number: 🔲

DATA CHANNEL EQUIPMENT LOCATION
    4. Carrier: 🔲
    5.   Slot : 🔲
    6. Channel: 🔲

 7. Digit Sent: 🔲


FAILURE CODES
    8. First Failure Code: 🔲
    9.  Last Failure Code: 🔲




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▄
[        ][        ][ F3 DATA ][        ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Field 2 shows the display terminal with the least number of features if there are no failures from test 1 or 2 (see Table 6-17). If there are failures from test 1 or 2, the last display terminal that failed appears.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Test a Selected Display Terminal Continuously

1. To select a display terminal type, enter nu until the terminal type you want to test appears.

2. To select a selected display terminal, enter nc until the display terminal you want to test appears.

    Display terminals appear in numerical order.

    After you view all display terminals, the switch dashes all fields. If you enter nc or nu again, the first display terminal equipment location in the lowest terminal type appears.

3. Enter x to test a display terminal continuously.

    Field 7 shows the digit that appears on the display terminal. The count starts at 0, progresses to 9, a dash appears, and the pattern repeats.

4. Compare the digits, in field 7 on your screen, with the digits on the display terminal.

    If the terminal missed any digits, there are intermittent problems. If no digits appear, there are cabling problems.

5. Enter s to stop the test.

    Fields 8 and 9 show the failure codes (see Table 6-18).

6. If there is a failure, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 37 (CAS) and 39 (FADS).

7. If you want to select another terminal to test repeat steps 1-7.

8. If you want to examine the display terminals failure history log or resolve alarms, go to test 1.

9. If you want to test all display terminals, go to test 2.

TABLE 6-17

Field 2 Terminal Type		
1	=	Calling number display
13	=	CAS/FADS terminal

TABLE 6-18

Fields 8 and 9 Failure Code		
0	=	Pass
1	=	Data channel addressing problem
2	=	No reply from terminal
3	=	Data channel addressing problem and no reply
4	=	Bad reply from terminal
5	=	Data channel addressing problem and bad reply
6	=	No reply from terminal or bad reply
7	=	Data channel addressing problem, no reply, or bad reply

Procedure Fields

The meaning of the fields are:

2.   Terminal type   Shows whether the terminal is a call number display, a centralized attendant service (CAS) or force administration data terminal (FADS). Tab1e 6-17 shows the terminal type encodes.

3.   Extension or   Shows the extension number for terminal type 1 or the unit number
         Unit Number   for terminal type 13. The extension number can be any 1, 2, 3, or 4 digit number.

4-6.   DATA CHANNEL   Shows the equipment location of the data channel connected to the
         EQUIPMENT   display terminal.
         LOCATION

7.   Digit Sent   Shows the digit sent to the display terminal. The digit starts at 0, counts up to 9, dashes the field, and repeats. If the display terminal can show more than one number, all digits equal the digit sent..

8-9.   FAILURE CODES   The first failure code shows all failures since the test started. The last failure code shows the last failure from the test. The switch updates the last failure code during test 3. Table 6-18 shows the failure code encodes.

10.   Number of   Shows the number of data channels that failed. If a 99 appears, there
         Failures   are 99 or more failures.

11-13.   TIME STAMP   Shows when the terminal first failed, including the day, hour, and minute. The hour appears using a 24 hour clock.

PROCEDURE 655 - SMDR TESTS

Purpose

Use Procedure 655 to examine the station message detail recording (SMDR) failure history log, to resolve alarms, and to test the SMDR system.

Tests

Procedure 655 has five tests.

- Use test 1 to examine the SMDR failure history log and to resolve alarms.

- Use test 2 to run an echo test on SMDR equipment.

- Use test 3 to send an alternating one-zero pattern continuously.

- Use test 4 to send a test pattern to SMDR equipment.

- Use test 5 to enter operation codes and send a single data word.

Procedure Overview

The SMDR feature is a set of equipment and programs that record a stations all activity (usually on a station to trunk call). For each call the feature records station identity, completion time, call length, and the number dialed. The record also includes the trunk group the call used, and optionally the account code.

Use Procedure 655 to test the connection to the SMDR equipment. Use test 1 to examine the failure history log and to resolve alarms. Use test 2 to do an echo test to SMDR equipment. Use test 3 to send an alternating one-zero pattern continuously. Use test 4 to send a test pattern to SMDR equipment. Use test 5 to enter operation codes and send a single data word.

Use Procedure 611 Test 2 to test the dual-speed SMDR data channels.

Test 1 - Operation

Use test 1 to examine the SMDR failure history log and to resolve alarms.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one or both of the following:

    - If you are already in the procedure, but not in test 1, enter t1

    - Otherwise, enter p655

      The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 655, TEST: 1
                 EXAMINE THE SMDR FAILURE HISTORY LOG


DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier: ▢
   5.    Slot : ▢
   6. Channel: ▢


 9. Alarm Status: ▢


TIME STAMP
  10.     Day: ▢
  11.    Hour: ▢
  12. Minute: ▢


13. Failure Code: ▢




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT

enter command: ▬
|        ||      || F3 DATA ||      ||      || F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS
```

Fields 4-6 may show the SMDR data channel equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the SMDR Failure History Log

1. Enter x to sort the SMDR failure history log.

   The switch sorts SMDR failures by the failure time.

      Field 9 shows the SMDR alarm status (see Table 6-21).

      Field 13 shows the failure code (see Table 6-22). If there are no failures, field 13 contains a 0.

2. Enter nd to see each failure.

      Fields 4-6 show the SMDR data channel equipment location.

      Field 9 shows the SMDR alarm status (see Table 6-21).

      Fields 10-12 show when the failure occurred.

      Field 13 shows the failure code (see Table 6-22).

3. If there is a failure, go to test 2 and test the SMDR equipment.

4. If this is not the last failure repeat steps 1-4.

   After you view all failures, the switch dashes fields 9-13. If you enter nd again, the summary appears.

5. If you want to resolve invalid alarms, go to *To Resolve Alarms.*

6. If you want to do an echo test on SMDR equipment, go to test 2.

7. If you want to send an alternating one-zero pattern continuously to SMDR equipment, go to test 3.

8. If you want to send a test pattern to SMDR equipment, go to test 4.

9. If you want to enter operation codes and send a single data word, go to test 5.

To Resolve Alarms

You may want to resolve invalid alarms from the SMDR failure history log.

1. If you want to resolve all alarms, make sure that the alarm summary is on your screen.

   If the summary **is** not on your screen, enter x

2. If you want to resolve a single alarm make sure that the alarm is on your screen.

   If the alarm is not on your screen, enter x and then enter `nd` until the alarm you want to resolve appears.
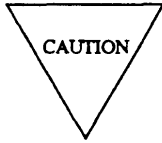
CAUTION   Record all alarms, and their time stamps, before you resolve them. Then you will have a failure record you can use for future troubleshooting.

3. Enter `cdx` to resolve alarms.

   If you resolved all alarms field 9 contains a 0.

   The switch marks SMDR alarms resolved. The switch turns off **OTHER FAILS** if there is no other reason for it to be on.   MAJOR and MINOR disappear from your screen if there is no other reason for them to be on.

4. If you want to do an echo test on SMDR equipment, go to test 2.

5. If you want to send an alternating one-zero pattern continuously to SMDR equipment go to test 3.

6. If you want to send a test pattern to SMDR equipment, go to test 4.

7. If you want to enter operation codes and send a single data word, go to test 5.

Test 2 - Operation

Use test 2 to do an echo test from the switch to the SMDR

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p655

   - If you are already in the procedure, but not in test 2, enter t2

     The test 2 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────┐
│┌──────────────────────────────────────────────────────────────────┐│
││          ENHANCED MODE - PROCEDURE: 655, TEST: 2                   ││
││             TEST SMDR EQUIPMENT WITH AN ECHO TEST                  ││
││                                                                    ││
│ DATA CHANNEL EQUIPMENT LOCATION                                     │
│    4. Carrier:  ▢                                                   │
│    5.    Slot:  ▢                                                   │
│    6. Channel:  ▢                                                   │
│                                                                    │
│ FAILURE CODE                                                        │
│    7. First Failure Code: ▢                                         │
│    8.  Last Failure Code: ▢                                         │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│ Connected to CC0 ON-LINE ♥ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]│
│ ──────────────────────────────────────────────────────────────────│
│ enter command: ▁                                                    │
│ [_____][_____][F3 DATA ][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]│
└──────────────────────────────────────────────────────────────────┘
```

Fields 4-6 show the SMDR data channel equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do an Echo Test

1. Enter x to send an alternating one-zero pattern.

   The switch sends an alternating one-zero pattern and then sends the complement of the first pattern.

   During the test, SMDR equipment still records calls.

   > Fields 4-6 show the SMDR data channel equipment location.

   > Fields 7 and 8 show the failure codes (see Table 6-20). If there are no failures, fields 7 and 8 contain a 0.

2. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 20.

3. If you want to examine the SMDR failure history log or resolve invalid alarms, go to test 1.

4. If you want to send an alternating one-zero pattern continuously to SMDR equipment, go to test 3.

5. If you want to send a test pattern to SMDR equipment, go to test 4.

6. If you want to enter operation codes and send a single data word, go to test 5.

Test 3 - Operation

Use test 3 to send an alternating one-zero pattern continuously.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen choose one or both of the following:

   - To start the procedure, enter `p655`

   - If you are already in the procedure, but not in test 3, enter `t3`

     The test 3 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 655, TEST: 3
            CONTINUOUSLY SEND A TEST PATTERN TO SMDR EQUIPMENT

TEST WORD
   2. Operation Code:  ▢
   3.      Data Word:  ▢

DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier:  ▢
   5.    Slot:  ▢
   6. Channel:  ▢

FAILURE CODE
   7. First Failure Code:  ▢
   8.  Last Failure Code:  ▢

14. Message Length:  ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][_____][F3 DATA][_____][F5 HELP][F6 FIELD][F7 INPUT][F8 CMDS]
```

Field 14 contains a 0 (see Table 6-23).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Test Pattern Continuously

You must beat the switch site to operate SMDR equipment and examine the SMDR output.

1. Change field 12 of Procedure 275 Word 1 from a 1 to a 0 to disable SMDR service.
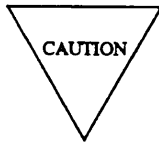
   ⚠️ **CAUTION**   When you disable SMDR service, call recording is blocked until you enable it.

2. Load a spare tape into the 9-track SMDR tape drive.
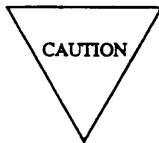
   ⚠️ **CAUTION**   Check with the switch administrator before you change the SMDR 9-track tapes.

3. To select a different word length, choose from the following:

   - To select a 12 word message length, enter nd until field 14 contains a 0.

   - To select a 15 word message length, enter nd until field 14 contains a 1.

   - To select an 18 word message length, enter nd until field 14 contains a 2.

4. Enter x to send a test pattern continuously.

   If you did not disable SMDR service, special error code 80 appears in the message line. Go back to step 1 and disable SMDR service.

   Fields 2 and 3 show the operand code and data word the switch sends to SMDR equipment (see Table 6-19).

   Fields 4-6 show the SMDR data channel equipment location.

   Fields 7 and 8 show the first and last failure codes (see Table 6-20).

   Field 14 show the message length encode (see Table 6-19).

   The switch sends a data word, waits for one-half second, and then sends the complement of the first data word. After the last word sent (normally word 12), there is a two-second delay before the start of the next word so you can stop the test.

5. Enter s to stop the test.

   Fields 7 and 8 show the failure codes (see Table 6-20). If there are no failures, fields 7 and 8 contain a 0.

6. Compare the output to Figures 6-1 to 6-3.

7. If there are any failures, go to *DEFINITY*™ *Communications System Generic* 2 *Maintenance Repair Strategies* (555-104-118) and follow the repair steps for unit type 20.

8. When you finish testing place the original tape in the 9-track SMDR tape drive and notify the system administrator.

9. Change field 12 of Procedure 275 Word 1 from 0 to 1.

10. If you want to examine the SMDR failure history log or resolve alarms, go to test 1.

11. If you want to do an echo test on SMDR equipment, go to test 2.

12. If you want to send a test pattern to SMDR equipment, go to test 4.

13. If you want to enter operation codes and send a single data word, go to test 5.

```
0923      5 E 5     55 5    555    555    555    55 56789 <= >
0923      5 E 5     55 5    555    555    555    55 5789 < => ?
```

Figure 6-1. Test 3, 12-Word Format

```
0923      5 E 5     55 5    555    555    555    55 5    555
```

Figure 6-2. Test 3, 15-Word Format

```
0922 555            55 5    555      55 5    555    555    55 5
```

Figure 6-3. Test 3, 18-Word Format

Test 4 - Operation

Use test 4 to send a test pattern to the SMDR.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

    *   To start the procedure, enter `p655`

    *   If you are already in the procedure, but not in test 4, enter `t4`

        The test 4 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 655, TEST: 4
                      SEND A TEST PATTERN TO SMDR EQUIPMENT

DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier: ⬛
   5.    Slot: ⬛
   6. Channel: ⬛


FAILURE CODE
   7. First Failure Code: ⬛
   8.  Last Failure Code: ⬛

14.  Message Length Encode: ⬛








Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▬
|_____||_____||F3 DATA ||_____||F5 HELP ||F6 FIELD ||F7 INPUT ||F8 CMDS |
```

Field 14 contains a 0 (see Table 6-19).

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Test Pattern

You must be at the switch site to operate SMDR equipment and to compare the test messages to the SMDR outputs.

1. To change the call record message length, choose from the following:

    - To select a 12 word message length, enter nd until field 14 contains a 0.

    - To select a 15 word message length, enter nd until field 14 contains a 1.

    - To select an 18 word message length, enter nd until field 14 contains a 2.

2. Enter x to send a test pattern with 12-, 15-, or 18-word format.

    The switch sends the following SMDR operation codes.

    - Normal word transmission.

    - Last word of message transmission.

    - Retransmit normal word.

    - Retransmit last word.

        Fields 4-6 show the SMDR data channel equipment location.

        Fields 7 and 8 show the first and last failure codes. If there are no failures, fields 7 and 8 contain a 0.

        Field 14 shows the message length encode (see Table 6-19).

3. Compare the output to Figures 6-5 to 6-7.

    Note that if you are using the 9-track magnetic tape SMDR equipment, with 12 or 15 word format, only the numerical characters of the messages may appear.

    Figure 6-8, *Hexadecimal Dump for Test 4 Call with 12 Word Format,* shows a hexadecimal dump for test 4.

    If the test passes, the switch marks SMDR alarms resolved. The switch turns off **OTHER FAILS, MAJOR,** or **MINOR** indicators on the common-control alarm panel if there is no other reason for them to be on.

    The test message of Figure 6-5 completely fills the memory buffer and tests the direct output SMDR.

4. If you are testing the 9-track magnetic tape SMDR equipment, repeat step 2 three more times to fill the two 9-track SMDR 3 l-message memory buffer.

5. If you tested 9-track magnetic tape SMDR equipment use the following steps to examine each call record as it is written on the magnetic tape (see Figure 6-4, *Type II SMDR 9-Track System Control Panel).*

   a. **Press the ON-LINE** button on the tape drive unit and press the **ON-LINE** button on the 9-track control panel.

   b. Set **EXTENSION NUMBER/AUTO** to **EXTENSION NUMBER.**

   c. Set the thumb-wheel switch to the station or extension to see a specific extension call record.

   d. Press **CLEAR DISPLAY** to resolve the control panel display before you examine a new call record.

   e. Enter **DUMP MEMORY** to write the contents of the on-line memory buffer to tape.

   f. Enter **DUMP MEMORY** again to write the alternate on-line memory buffer to tape.

6. Compare the output to Figures 6-5 to 6-7.

7. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 20.

8. If you want to examine SMDR failure history or resolve alarms, go to test 1.

9. If you want to do an echo test, go to test 2.

10. If you want to do an echo test continuously, go to test 3.

11. If you want to enter operating codes and send a single data word, go to test 5.
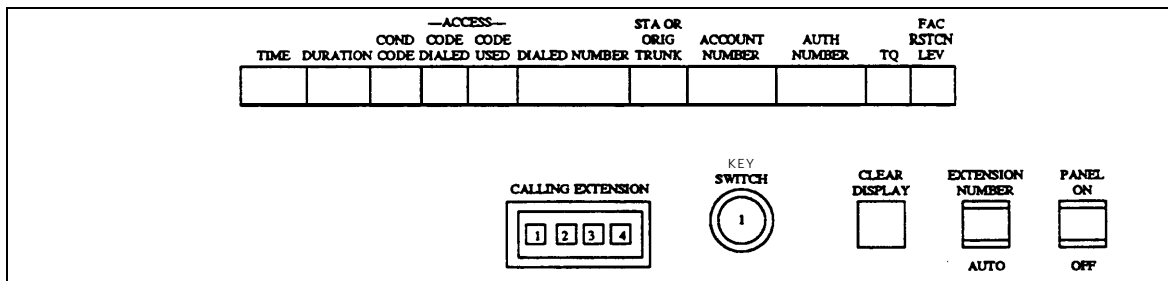
Figure 6-4. Type II SMDR 9-Track System Control Panel

CORRECT TIME	DURATION	CODE COND CODE	CODE DIALED	CODE USED	DIALED NUMBER	EXTENSION NUMBER	ACCOUNT NUMBER	AUTH CODE	FAC RSTCN TQ LEV
0920	0123	E	567	89	<=>?0123456789	1111	>?012	3456789	<
0920	1234	E	678	9	<=>?0123456789	2222	55523	456789	< =
0920	2345	E	789	<	=>?0123456789	3333	01234	56789	<= >
0920	3456	E	89	<=	>?0123456789 <	4444	12345	6789	< => ?
0920	4567	E	9	<=>	?0123456789 <=	5555	23456	789	<= >? 0
0920	5678	E	<	=>?	0123456789 <=>	6666	34567	89	<=> ?0 1
0920	6789	E	<=	>?0	123456789 <=>?	7777	45678	9	<=>? 01 2
0920	789	E	<=>	?01	23456789 <=>?0	8888	56789		<=>?0 12 3
0920	89	E	=>?	012	3456789 <=>?01	9999	6789		<=>?01 23 4
0920	9	< E	>?0	123	456789 <=>?012		789		<=>?012 34 5
0920		<= E	?01	234	56789 <=>?0123		89 <		=>?0123 45 6
0920		<=> E	012	345	6789 <=>?01234	<<<<	9 <=		>?01234 56 7
0920		<=>? E	123	456	789 <=>?012345	====	<=>		?012345 67 8
0920		=>?0 E	234	567	89 <=>?0123456	>>>>	<=>?		0123456 78 9
0920		>?01 E	345	678	9 <=>?01234567	????	<=>?0		1234567 89
0920		?012 E	456	789	<=>?012345678	0000	=>?01		2345678 9

Figure 6-5. Test 4, 12-Word Format

```
0921 0123 E 567 89   <=>?0123456789 1111 >?012 3456789       <
0921 1234 E 678 9    <=>?0123456789 2222 ?0123 4567555  < =
0921 2345 E 789   <  =>?0123456789  3333 01234 56789    <= >
0921 3456 E 89   <=  >?0123456789 < 4444 12345 6789   < => ?
0921 4567 E 9   <=>  ?0123456789 <= 5555 23456 789   <= >? 0
0921 5678 E   <  =>? 0123456789 <=> 6666 34567 89   <=> ?0 1
0921 6789 E  <=  >?0 123456789 <=>? 7777 45678 9   <=>? 01 2
0921 789  E <=>  ?01 23456789 <=>?0 8888 56789     <=>?0 12 3
0921 89   E =>?  012 3456789 <=>?01 9999 6789      <=>?01 23 4
0921 9  < E >?0  123 456789 <=>?012       789      <=>?012 34 5
0921    <= E ?01 234 56789 <=>?0123       89  <   =>?0123 45 6
0921  <=> E 012 345 6789 <=>?01234 <<<< 9  <=  >?01234 56 7
0921 <=>? E 123 456 789 <=>?012345 ====   <=> ?012345 67 8
0921 =>?0 E 234 567 89  <=>?0123456 >>>>  <=>? 0123456 78 9
0921 >?01 E 345 678 9  <=>?01234567 ???? <=>?0 1234567 89
0921 ?012 E 456 789    <=>?012345678 0000 =>?01 2345678 9
```

Figure 6-6. Test 4, 15-Word Format

```
                     CODE                                EXTENSION
          DURATION  DIALED                                NUMBER                              FAC
  CORRECT       COND       CODE                                    ACCOUNT              RSTCN
   TIME    |    CODE  |    USED      DIALED NUMBER          |      NUMBER   AUTH CODE  TO LEV
  0921  0123  D  567  89      <=>?0123456789  1111  >?012  3456789         <
  0921  5554  E  678  9       <=>?0123456789  2222  ?0123  456789       <  =
  0921  2345  F  789   <      =>?0123456789   3333  01234  56789        <= >
  0921  3456  G  89    <=     >?0123456789  < 4444  12345  6789      <  =?  ?
  0921  4567  H  9     <=>     ?0123456789  <= 5555  23456  789     <=  >?  0
  0921  5678  I   <    =>?      0123456789  <=> 6666 34567  89     <=>  ?0  1
  0921  6789      <=   >?0      123456789  <=>? 7777 45678  9     <=>?  01  2
  0921  789       <=>  ?01      23456789  <=>?0 8888 56789        <=>?0 12  3
  0921  89     L  =>?  012      3456789  <=>?01 9999 6789         <=>?01 23 4
  0921  9   <  M  >?0  123      456789  <=>?012       789         <=>?012 34 5
  0921      <= N  ?01  234      56789  <=>?0123        89   <  =>?0123  45  6
  0921  <=>  O  012  345      6789  <=>?01234 <<<< 9    <=  >?01234   56  7
  0921  <=>?  @  123  456      789  <=>?012345 ====     <=>  ?012345  67  8
  0921  =>?0  A  234  567      89  <=>?0123456 >>>>   <=>?  0123456   78  9
  0921  >?01  B  345  678      9  <=>?01234567 ????  <=>?0  1234567   89
  0921  ?012  C  456  789         <=>?012345678 0000 =>?01  2345678  9
```

Figure 6-7. Test 4, 18-Word Format

```
                1   2   3   4   5   6   7   8   9  10  11  12           WORD NUMBER

          ****  FILE  0001     RECORD  00005     LENGTH = 001024    4555 IS RETRANSMITTED
      1   141720122355067829ABOCDEOFO12234256708910111 2EF08123      MIDDLE WORD
      2   14170123045627890ABC2DEF20120345067829A222224555A234   ◄──   E999 IS RETRANSMITTED
      3   141702340557289A0BCD2EF02123045607892AB323330012E999   ◄─────LAST WORD
      4   14172235265809AB5CDE0F0102342567289A0BC4044421238456
      5   1417045607592ABC0DEF20122345067809AB2CD525550234A567
      6   14172567285A0BCD2EF00123045627892ABC0DE6066623458678
      7   14172678295B0CDE2F0102340567289A2BCD0EF7077724568789
      8   141707890A5C2DEF00122345067809AB0CDE2F0828880567A89A
      9   1417089A0B5D2EF00123245627890ABC0DEF201929990678A9AB
     10   141729AB2C5E0F0122340567089A2BCD2EF0012A0AAA27898ABC   NOTE:   BIT 2 OF THE OP CODE
     11   14172ABC2D5F00122345067809AB2CDE2F01023B0BBB289A8BCD           (PARITY BIT) MAY BE
     12   14170BCD0E502123045627892ABC0DEF0012234C2CCC09ABACDE           INCORRECT IN THIS TABLE.
     13   14172CDE2F5102342567089A0BCE2EF02123045D0DDD2ABC8DEF
     14   14170DEF00522345067829AB2CDE0F010234256E2EEE0BCDAEF0
     15   14170EF00153245607892ABC2DEF00120345267F2FFF0CDEAF01
     16   14172F0122540567289A0BCD0EF0212324560780000 02DEF8012
                  ▲       ▲                       ▲ ▲▲▲
                  │       │                       │ │││
                  │       │                       │ │││
     NORMAL ──────┘       └──── CONDITION     CALLING
     WORD OP                    CODE          STATION
     CODE
```

Figure 6-8. Hexadecimal Dump for Test 4 Call with 12-Word Format

Test 5 - Operation

Use test 5 to send one test word.

In test 5 you can:

To View the Test 5 Screen

1. To see the test 5 screen, choose one or both of the following:

    - To start the procedure, enter `p655`

    - If you are already in the procedure, but not in test 5, enter `t5`

      The test 5 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 655, TEST: 5
                   SEND ONE TEST WORD TO SMDR EQUIPMENT


 TEST WORD
    2. Operation Code: ▢
    3.      Data Word: ▢

 DATA CHANNEL EQUIPMENT LOCATION
    4. Carrier: ▢
    5.    Slot: ▢
    6. Channel: ▢

 FAILURE CODE
    7. First Failure Code: ▢
    8.  Last Failure Code: ▢




Connected to CC0 ON-LINE ♡ ╶MAJOR╴ ╶MINOR╴ ╶RUN TAPE╴ ╶BUSY OUT╴ ╶IN USE╴ ╶WAIT╴

enter command: ▭
╷        ╷╷        ╷╷F3 DATA ╷╷        ╷╷F5 HELP ╷╷F6 FIELD╷╷F7 INPUT╷╷F8 CMDS╷
```

Fields 2 and 3 contain a default operation code (see Table 6-19). The switch highlights field 2 and the test word.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Single Test Word

1. Change field 12 of Procedure 275 Word 1 from a 1 to a **0** to disable SMDR service.
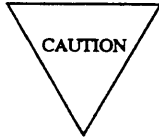
> ⚠ **CAUTION**   When you disable SMDR service, call recording is blocked until you enable it.

2. Load a spare tape into the 9-track SMDR tape drive.
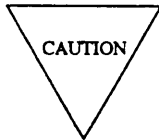
> ⚠ **CAUTION**   Check with the switch administrator before you change the SMDR 9-track tapes.

3. To select an operation code and data word, choose from the following:

   - Enter cf2 and enter the operation code and the data word.

   - Enter nd until the operation code and data word you want to send appears.

4. Enter x to send a data word.

   If you did not disable SMDR service, special error code 80 appears in the message line.

   Fields 2 and 3 show the operation code and data word the switch sends to the SMDR equipment (see Table 6-19).

   Fields 4-6 show the SMDR data channel equipment location.

   Fields 7 and 8 show the first and last failure codes. If there are no failures, field 7 and 8 contain a 0.

5. Compare the output to Figures 6-9 to 6-11.

6. Load the 9-track SMDR tape.

7. Enable SMDR service by changing field 12 of Procedure 275 Word 1 from 0 to 1.

8. If there are any failures or if the SMDR outputs are not similar, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and test unit type 20.

9. If you want to examine the SMDR failure history log or resolve alarms, go to test 1.

10. If you want to do an echo test, go to test 2.

11. If you want to do an echo test continuously, go to test 3.

12. If you want to send a test message pattern, go to test 4.

```
0926 555          55 5    555       55 5    555      555      55 5
```

Figure 6-9. Test 5, Word 14

```
0929 5555 E 5    55 5    555    555    555    55 5    555
0929 5555 E 5    55 5    555    555    555    55 56789   <=
0929 5555 E 5    55 5    555    555    555    55 5789 < =>
```

Figure 6-10. Test 5, Words 10 and 14

```
0933    5 E 5    55 5    555    555    555    55 5    555
0933 5555 E 5    55 5    555    555    555    55 5    555
0933 5555 E 5    55 5    555    555    555    55 5    555
0933    5   5    55 5    555    555    555    55 5    555
```

Figure 6-11. Test 5, Word 10

TABLE 6-19

Field 2 Operation Code		
0	=	Normal data word
3	=	No operation
4	=	Retransmit normal data word
10	=	Last word in message
14	=	Retransmit last word in message

TABLE 6-20

Fields 7 and 8 Failure Codes		
0	=	Pass
1	=	Data addressing problem
2	=	No reply from SMDR equipment
3	=	Data addressing problem and no reply
4	=	Echo mismatch
5	=	Data addressing problem and echo mismatch
6	=	No reply from SMDR equipment and echo mismatch
7	=	Data addressing problem, no reply, and echo mismatch
8	=	SMDR equipment failure

TABLE 6-21

Field 9 Alarm Status		
0	=	No SMDR failures
1	=	SMDR failure

TABLE 6-22

Field 13 Failure Codes		
0	=	No failures
1	=	No reply or echo mismatch
8	=	SMDR equipment failure

TABLE 6-23

Field 14 Message Length		
0	=	12 Word message
1	=	15 Word message
2	=	18 Word message

Special Error Codes

While using procedure 655 you may see the following special error codes:

- 80=Use Procedure 275 Word 1 to disable SMDR service.

    You entered x in test 3 or 5 without first disabling SMDR call recording. Go to Procedure 275 Word 1 and disable SMDR service.

Procedure Fields

The fields listed below are data entry fields.

- In test 5 you can select the operation code and data word in fields 2 and 3.

The meaning of the fields are:

2.	Operation Code	Shows the operation code the switch sends to the SMDR equipment.
3.	Data Word	Shows the data the switch sends to the SMDR equipment.
4-6.	DATA CHANNEL EQUIPMENT LOCATION	Shows the equipment location of the SMDR data channel.
7-8.	FAILURE CODE	The first failure code shows the first failure since the test started. The last failure code shows the last failure from the test. The switch updates the failure code during test 3. Table 6-20 shows the failure codes.
9.	Alarm Status	Shows the status of the SMDR equipment. Table 6-21 shows the alarm cause encodes.
10-12.	TIME STAMP	Show when the SMDR equipment failed. The hour appears using a 24 hour clock.
13.	Failure Code	Initially shows the summary. Shows why the SMDR link failed. Table 6-22 shows the failure code encodes.
14.	Message Length	Shows the message length sent to the SMDR equipment. Table 6-23 shows the message length encodes.

PROCEDURE 656 - NCOSS AND CDRU TESTS

Purpose

Use Procedure 656 to test CDRU or NCOSS equipment.

Tests

Procedure 656 has four tests.

- Use test 1 to run an echo test on the NCOSS or CDRU equipment.
- Use test 2 to send an alternating one-zero pattern continuously.
- Use test 3 to send test message pattern to NCOSS or CDRU equipment.
- Use test 4 to enter operation codes and send a single data word.

Procedure Overview

The call detail recording utility (CDRU) system collects, store, and optionally filters telephone records sent from the switch. The network control operations support system (NCOSS) is a network maintenance and traffic network administration support tool. NCOSS also collects telephone records.

Use Procedure 656 to test the connection from the switch to the CDRU or to NCOSS. CDRU and NCOSS use the same I/O channel type. CDRU can be supported through a dual-speed data channel circuit pack or through a PCC. If the CDRU is connected through the dual-speed data channel (TN403) circuit pack, use this procedure. If the CDRU is connected through a PCC, use Procedure 651 to test the PCCS for the CDRU.

Use test 1 to do an echo test to CDRU or NCOSS equipment. Use test 2 to send an alternating one-zero pattern continuously when you suspect there are intermittent problems. Use test 3 to send a test message pattern to CDRU or NCOSS equipment. Use test 4 to enter operation codes and send a single data word.

You must beat the switch site to examine outputs while using tests 2-4.

Use Procedure 611 Test 3 to isolate I/O failures.

Test 1- Operation

Use test 1 to do an echo test from the switch to NCOSS or CDRU equipment.

In test 1 you can:

View the test 1 screen   *page 6-86*

Do an echo test   *page 6-87*

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure but not in test 1, enter `t1`

   ● Otherwise, enter `p656`

     The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 656, TEST: 1
            TEST CDRU/NCOSS EQUIPMENT WITH AN ECHO TEST

DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier:  ▢
   5.    Slot :  ▢
   6. Channel:  ▢

FAILURE CODE
   7. First Failure Code:  ▢
   8.  Last Failure Code:  ▢














Connected to CC0 ON-LINE ♡ ⎡ MAJOR ⎤⎡ MINOR ⎤⎡ RUN TAPE ⎤⎡ BUSY OUT ⎤⎡ IN USE ⎤⎡ WAIT ⎤

enter command: ▭
⎡_____⎤⎡_____⎤⎡F3 DATA⎤⎡_____⎤⎡F5 HELP⎤⎡F6 FIELD⎤⎡F7 INPUT⎤⎡F8 CMDS⎤
```

Fields 4-6 show the NCOSS or CDRU data channel equipment location.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do an Echo Test

In an echo test the switch sends test patterns to the CDRU or NCOSS data channel. The data is looped back and tested for accuracy.

1. To select an NCOSS or CDRU data channel, enter `nc` until the data channel you want to test appears.

   After you view all data channels, the switch dashes all fields on your screen. If you enter `nc` again, the first data channel appears.

2. Enter `x` to send an alternating one-zero pattern.

   The switch sends an alternating one-zero pattern. It then sends the compliment of the first pattern. During the test NCOSS and CDRU equipment records calls.

   Fields 4-6 show the NCOSS or CDRU data channel equipment location.

   Fields 7 and 8 show the total number of failures and failure type (see Table 6-25). If there are no failures, fields 7 and 8 contain a 0.

3. If there are NCOSS or CDRU failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps there.

4. If you want to test another NCOSS or CDRU circuit, repeats steps 1-4.

5. If you want to send a test pattern continuously, go to test 2.

6. If you want to send a test message pattern to CDRU or NCOSS equipment, go to test 3.

7. If you want to enter operation codes and send a single data word, go to test 4.

Test 2 - Operation

Use test 2 to send an alternating one-zero pattern continuously.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

    ● To start the procedure, enter `p656`

    ● If you are already in the procedure but not in test 2, enter `t2`

    The test 2 screen, similar to the following, appears.

```
                ENHANCED MODE - PROCEDURE: 656, TEST: 2
              CONTINUOUSLY SEND A TEST PATTERN TO CDRU/NCOSS EQUIPMENT


 TEST WORD
    2. Operation Code:  ▢
    3.      Data Word:  ▢

 DATA CHANNEL EQUIPMENT LOCATION
    4. Carrier:  ▢
    5.    Slot:  ▢
    6. Channel:  ▢

 FAILURE CODE
    7. First Failure Code:  ▢
    8. Last Failures Code:  ▢




 Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

 enter command: ▬
 [        ][    ][ F3 DATA ][    ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Fields 4-6 may show a default equipment location from test 1, 3, or 4.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Test Pattern Continuously

1. If you want to select an NCOSS or CDRU circuit, enter `nc` until the data channel you want to test appears.
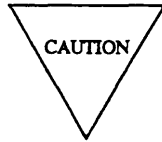
△ CAUTION   NCOSS or CDRU call recording is blocked during the tests.

2. Enter `x` to send a test pattern.

   The switch sends a data word, waits for one-half second, and then sends the compliment of the data word. After the last word, normally word 18, and before the start of the next word the switch waits two seconds and then repeats the pattern.

   Fields 2 and 3 show the operation code and data word the switch sends to the NCOSS or CDRU equipment (see Table 6-24).

   Fields 4-6 show the NCOSS or CDRU data channel equipment location.

   Fields 7 and 8 show the first and last failure codes (see Table 6-25). If there are no failures, fields 7 and 8 contain a 0.

3. Enter `s` to stop the test.

   Fields 7 and 8 show the first and last failure codes (see Table 6-25). If there are no failures, fields 7 and 8 contain a 0.

4. If there are NCOSS or CDRU failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps there.

5. If you want to test another NCOSS or CDRU circuit, repeat steps 1-5.

6. If you want to do an echo test, go to test 1.

7. If you want to send a test message pattern to NCOSS or CDRU equipment, go to test 3.

8. If you want to enter operation codes and send a single data word, go to test 4.

Test 3 - Operation

Use test 3 **to** send a test pattern to the NCOSS or CDRU equipment in 12, 15, or 18 word format.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

    ● To start the procedure, enter `p656`

    ● If you are already in the procedure but not in test 3, enter t3

    The test 3 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 656, TEST: 3
                 SEND A TEST PATTERN TO CDRU/NCOSS EQUIPMENT

 DATA CHANNEL EQUIPMENT LOCATION
    4. Carrier: ▢
    5.    Slot: ▢
    6. Channel: ▢

 FAILURE CODE
    7. First Failure Code: ▢
    8.  Last Failure Code: ▢










 Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

 enter command: ▬
 [_____][_____][ F3 DATA ][_____][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Fields 4-6 may show a default equipment location from test 1, 2, or 4.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Test Message Pattern

1. If you want to select an NCOSS or CDRU circuit, enter `nc` until the data channel you want to test appears.

2. Enter `x` to test the NCOSS link.
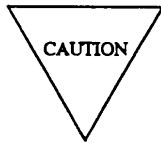
⚠ CAUTION   NCOSS or CDRU call recording is blocked during the test.

The switch sends four of the NCOSS or CDRU operation codes. These codes are: normal word transmission, last word of message transmission, retransmit normal word, and retransmit last word.

Fields 4-6 show the NCOSS or CDRU data channel equipment location.

Fields 7 and 8 show the first and last failure codes (see Table 6-25). If there are no failures, fields 7 and 8 contain a 0.

3. Check the output (see Figure 6-12) to ensure that the NCOSS equipment is operating properly.

4. If there are NCOSS or CDRU failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps there.

5. If you want to test another NCOSS or CDRU circuit repeat steps 1-5.

6. If you want to do an echo test, go to test 1.

7. If you want to send an alternating one-zero pattern, go to test 2.

8. If you want to enter operation codes and send a single data word, go to test 4.

```
                                                    WORD NUMBER ──────────────────┐
                                                                                  │
                                                                                  │
                                            4555 IS RETRANSMITTED                 │
                                            MIDDLE WORD ──────────────────────┐   │
                                            E999 IS RETRANSMITTED             │   │
                                            LAST WORD ─────────────────────┐  │   │
                                                                           │  │   │
                   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18◄─────────┘
                 ****  FILE   0001      RECORD   00005      LENGTH = 001024      ****
      1   1417201223550678 29ABOCDEOFO122342567089101112EF001232 45627890ABC0DEF2012A345
      2   14170123045627890ABC2DEF20120345067829A222220F0122340567089A2BCD2EF045558456   ◄─────
      3   141702340557289A0BCD2EF02123045607892AB323330012234 5067809AB2CDE2F010234C999   ◄─────
      4   14172235265809AB5CDE0F0102342567289A0BC404442123045627892ABC0DEF00122345A678
      5   1417045607592ABC0DEF20122345067809AB2CD525550 2342567089A0BCD2EF0212304568789
      6   14172567285A0BCD2EF00123045627892ABC0DE606662345067829AB2CDE0F0102342567A89A
      7   14172678295B0CDE2F0102340567289A2BCD0EF70777245607892ABC2DEF001203452568A9AB
      8   141707890A5C2DEF00122345067809AB0CDE2F08 28880567289A0BCD0EF02123245607898ABC
      9   1417089A0B5D2EF00123245627890ABC0DEF20192999067829AB0CDE0F0122342567089A8BCD
     10   141729AB2C5E0F0122340567089A2BCD2EF0012A0AAA27890ABC2DEF20120345067829ABACDE
     11   14172ABC2D5F00122345067809AB2CDE2F01023B0BBB289A0BCD2EF02123045607892ABCADEF
     12   14170BCD0E502123045627892ABC0DEF0012234C2CCC09AB2CDE0F0102342567289A0BCD9EF0
     13   14172CDE2F5102342567089A0BCE2EF02123045D0DDD2ABC0DEF20122345067809AB2CDEAF01
     14   14170DEF00522345067829AB2CDE0F010234256E2EEE0BCD2EF00123045627892ABC0DEF8012
     15   14170EF00153245607892ABC2DEF00120345267F2FFF0CDE2F0102340567289A2BCD0EF08123
     16   14172F0122540567289A0BCD0EF02123245607800 00002DEF00122345267809AB0CDE2F01A234
                    ↑           ↑                   ↑↑↑
       NORMAL ──────┘      ┌────CONDITION         ┌─┴┴┴──┐  CALLING
       WORD OP            ─┘    CODE              └──────┘  STATION
       CODE
```

NOTE
Bit 2 of the Op Code (parity bit) may be incorrect in this table.

Figure 6-12. Hexadecimal Dump for a Test 3 Call with 18-Word Format

Test 4 - Operation

Use test 4 to send a single test word.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

   • To start the procedure, enter `p656`

   • If you are already in the procedure but not in test 4, enter `t4`

     The test 4 screen, similar to the following, appears.

```
           ENHANCED MODE -  PROCEDURE: 656, TEST: 4
              SEND  ONE  TEST  WORD  TO  CDRU/NCOSS  EQUIPMENT


TEST WORD
   2. Operation Code: ⬜
   3.   Data in Octal: ⬜

DATA CHANNEL EQUIPMENT LOCATION
   4. Carrier: ⬜
   5.    Slot: ⬜
   6. Channel: ⬜

FAILURE CODE
   7. First Failure Code: ⬜
   8.   Last Failure Code: ⬜




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▬
[_____][____][ F3 DATA ][____][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

Fields 2 and 3 contain a default operation code and test word (see Table 6-24).

Fields 4-6 may contain a default equipment location from test 1.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Send a Single Test Word
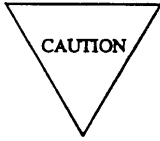
⚠️ CAUTION   NCOSS or CDRU call recording is blocked during the test. At the end of the test the switch continues to block transmission for two minutes.

1. If you want to select an NCOSS or CDRU circuit, enter `nc` until the data channel you want to test appears.

   After you view all data channels, the switch dashes all fields. If you enter `nc` again, the first data channel appears.

2. If you want to select a data word and operation code, choose from the following:

   - Enter `nd` until the data word and operation code you want to send appears in fields 2 and 3.

     There are 10 default operation codes and data words available. See Table 6-24 for the operation code. The default data word is either 2525 or 5252.

   - Enter `cf2` and enter an operation code and any data word in field 2 and 3.

3. Enter `x` to send the operation code and test word.

   Fields 2 and 3 show the operation code and data word the switch sends to the NCOSS or CDRU equipment (see Table 6-24).

   Fields 4-6 show the NCOSS or CDRU data channel equipment location.

   Fields 7 and 8 show the first and last failure code (see Table 6-25). If there are no failures, fields 7 and 8 contain a 0.

4. Check the output to ensure that the NCOSS equipment is operating properly.

5. If there are any failures, go to *DEFINITY™ Communications System Generic 2 Maintenance Repair Strategies* (555-104-118) and follow the repair steps there.

6. If you want to send different word and operation code, repeat steps 1-6.

7. If you want to do an echo test, go to test 1.

8. If you want to send a test message pattern to NCOSS or CDRU equipment, go to test 3.

9. If you want to enter operation codes and send a single data word, go to test 4.

TABLE 6-24

Field 2 Operation Code		
0	=	Normal data word
3	=	No operation
4	=	Retransmit normal data word
10	=	Last word in message
14	=	Retransmit last word in message

TABLE 6-25

Field 7 and 8 Failure Codes		
0	=	Pass
1	=	Data addressing problem
2	=	No reply from SMDR equipment
3	=	Data addressing problem and no reply
4	=	Echo mismatch
5	=	Data addressing problem and echo mismatch
6	=	No reply from SMDR equipment and echo mismatch
7	=	Data addressing problem, no reply, and echo mismatch
8	=	NCOSS equipment failure

Procedure Fields

The fields listed below are data entry fields.

- In test 4 you can select operation codes and data words in fields 2 and 3.

The meaning of the fields are:

2.	`Operation Code`	Shows the operation code in octal. Table 6-24 shows the operation codes.
3.	`Data Word or Data in Octal`	Shows the data that the switch sends to the NCOSS or CDRU.
4-6.	`DATA CHANNEL EQUIPMENT LOCATION`	Shows the equipment location of the NCOSS or CDRU data channel.
7-8.	`FAILURE CODE`	The first failure code shows the number of failures since the test started. The last failure code shows the last failure from the test. The switch updates the last failure code during test 3. Table 6-25 shows the failure codes.

7. CONNECTION STATUS PROCEDURES

This chapter describes the connection status procedures. This group of maintenance procedures shows the connection status and lets you trace a call through the switch. Connection status procedures include Procedures 949-962.

The following lists summarizes the purpose of each connection status procedure.

PROCEDURE 949 - ISDN MESSAGE SEQUENCE TRACER

Use Procedure 949 to see ISDN messages.

PROCEDURE 959 - DCIU MESSAGE SEQUENCE TRACER

Use Procedure 959 to see DCIU messages.

PROCEDURE 960 - QUEUE ACTIVITY

Use Procedure 960 to see queue information for an equipment location, to see the equipment locations on a queue, or to view dynamic queue information.

PROCEDURE 961 - CONNECTION ACTIVITY

Use Procedure 961 to see the connection information based on connection number, time slot identity accumulator number, equipment location or DTDM equipment location, and to find the connection number and first active accumulator in a module.

PROCEDURE 962 - FACILITY CONNECTIONS

Use Procedure 962 to see the trunk number linkages for line records, to see facility and conference facility linkages for trunk records, and to see the progress mark and linkage information for a selected equipment location.

PROCEDURE 949 - ISDN MESSAGE SEQUENCE TRACER

PURPOSE

Procedure 949 is used to capture and display ISDN PRI messages associated with one or more ISDN PRI B or D channels on Generic 2.2 systems. When enabled, the ISDN message sequence tracer (MST) captures messages, placing them in the data capture buffer. You can then examine the messages stored in the data capture buffer. Some tests in procedure 949 allow you to decide which messages to capture, how many messages to capture, and when and for how long to capture messages. Other tests in this procedure control how you can display the captured messages. Still other tests allow you to monitor the status of the MST. The ISDN MST can be enabled or disabled from tests 1, 2, 3 and 5.

Procedure 949 has seven tests, as follows:

- Use test 1 to view the data capture buffer status and the state of the tracer, to enable or disable the ISDN MST, and to reserve or unreserve the ISDN MST data capture buffer.

- Use test 2 to scroll through the message types in the current ISDN trace without displaying the data for each message and to enable or disable the ISDN MST.

- Use test 3 to view all ISDN data collected from processes running under ISDN MST parameters set in tests 4-7 and to enable or disable the ISDN MST.

- Use test 4 to select the primary filter type for monitoring ISDN messages and to further refine the filter using calling/called digit analysis.

- Use test 5 to set up additional ISDN filters, buffer control options, gating controls, observe the enabled/disabled status of the tracer, and to enable or disable the ISDN MST.

- Use test 6 to build a trigger that will be used in test 5 to activate or de-activate the trace. The trigger will be a message or some sequence of messages.

- Use test 7 to specify a string of dialed digits for incoming call/calling party, incoming call-called party, outgoing call-calling party, or outgoing call-called party, which will activate the trace. These digit strings are then used in test 4.

Keystroke Conventions:

The keystrokes used in the MST are a mix of maintenance and administration commands. The following list describes the most frequently used commands:

- The keystrokes **cdx, xx,** and s are used to enable and disable the MST as follows:

  — The sequence **cdx x x** clears all data in the data capture buffer and enables the tracer.

  — The sequence **x x** enables the tracer but does not clear any data from the buffer.

  — The keystroke **s** disables the tracer and puts a gap marker in the data capture buffer.

- All fields by default either contain a dash (-) or some data.

- A highlighted field (a blanked-outfield in a different color) means you are being prompted to enter data in that field. If you enter data in that field, the highlight will move to the next field.

- To enter new data in any field, enter **cf** *field number data.*

  — You can enter successive data separated by spaces to enter data into successive fields.

  — For example, if you enter **cf 2 1 2 3 4,** field two will display 1, field 3 will display 2, field 4 will display 3 and field 5 will display 4.

- The data entered is put into a temporary buffer called a scratchpad and is displayed on the screen. Any original values still exist in permanent memory even though they are not displayed.

- Enter **cx** to write the scratchpad values to permanent memory. The values displayed are now the permanent values. The previous values are no longer retrievable because they have been overwritten.

- If, after entering data in one or more fields, you want to restore the original values, you can enter **dx.** This overwrites the scratchpad values with the permanent values and displays them. The entered data is then no longer relievable.

  Thus, if you have entered data into several fields and you decide you do not want to make those entries, you can type **dx** before you type **cx** to display the original data.

  Another way to restore the original data is to go to another test and back. When you return to the test, the data you entered since the last **cx** (the data in the scratchpad) is overwritten by the previous data (the data in permanent memory).

- In almost all cases, to enter a dash (-) in a field, enter **cf** *field number ce ;.* When **cx** is subsequently entered, the field will be dashed.

- The keystrokes "next unit" **(nu)** and "next data" **(nd)** are used to advance through data. The uses for these two keystrokes vary depending on the test, but **nd** is usually used to advance through data arrived at through a **nu.** For example, in test 6, pressing **nu** advances you from the current trigger number displayed in field 2 to the next defined trigger number. Pressing **nd** then advances you through each of the two segments for the trigger you arrived at with the **nu.**

  The specific uses of **nu** and **nd** for each test are described under each test.

- In most cases, you can enter data into one or more fields before performing **cx.** In some cases, however, you are required to enter data in several fields before you can perform a **cx. For** example, in test 6, if you enter data in a field of a trigger element, you must enter data in the rest of the fields from that point to the end of the element before you can do a **cx.**

TEST 1

The primary use for test 1 is to display the status of the ISDN MST. Test 1 can also be used to change or monitor the reserved/unreserved status of the ISDN MST data capture buffer and to enable or disable the ISDN MST. The data capture buffer is used for both procedures 949 and 959 but can only be used by one at a time.

To View the Test 1 Screen

To see the test 1 screen, enter **t1** from any point within procedure 949. The test 1 screen, similar to the following, appears.

```
                ENHANCED MODE-PROCEDURE : 949, TEST : 1
              DISPLAY ISDN MESSAGE SEQUENCE TRACER BUFFER STATUS

2.   Monitor Status: ☐
3.    Enable Status: ☐
4.    Active Status: ☐
5.       Wrap Count: ☐
6.     Percent Full: ☐
7.   Trigger Status: ☐
8.  Completion Code: ☐


STOP TIME FOR CURRENT TRACE
  9.   Month: ☐
 10.     Day: ☐
 11.    Hour: ☐
 12. Minute: ☐
 13. Second: ☐

14. ISDN Buffer Status: ☐



Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▭
|        ||        || 3 Data ||        || 5 Help || 6 Field || 7 Input || 8 Cmds |
```

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

    The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

    If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains DCIU data and you start an ISDN trace all

DCIU data will be lost.

The tracer continues to gather data until you enter s , until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter s .

    If you enter s you will override any preset options and immediately stop the tracer.

    Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from the point where it stopped, enter **x x** again.

To Change the MST Data Capture Buffer Status

If you want to reserve the MST data capture buffer so that it can only be used for the ISDN MST, enter **cf14 1.** This will prevent the buffer from being overwritten by DCIU MST data.

If you want to unreserve the MST data capture buffer for ISDN data, enter **cf14 0.**

Input Fields

You can change the reserved/unreserved status of the ISDN MST data capture buffer in field 14.

Field 2 — Monitor Status

Shows if the tracer is enabled for DCIU tracing, if the data capture buffer is reserved for DCIU tracing, or what ISDN facilities are being monitored.

l=DCIU trace enabled
2=Monitoring B Channel
3=Monitoring FAS D Channel
4=Monitoring NFAS D Channel
5=Monitoring NFAS span
6=Monitoring all D Channels
7=DCIU reserved buffer

Field 3 — Enable Status

When the ISDN MST is enabled, it stays enabled until one of the conditions in field 8 is met. During the time the ISDN MST is enabled, field 3 displays a 1. Encode 0 appears when the ISDN MST is disabled.

0=Disabled
1=Enabled

Field 4 — Active Status

The tracer is active only when data is actually being placed in the MST data capture buffer. Thus, field 4 flashes from a 0 to a 1 and back to 0 when data is being put into the buffer. Note that if you are working at 1200 bps, it is possible that data is being entered into the buffer but the 1 never appears (field 6 will continue to be incremented, however).

0=Not active
1=Active

Field 5 — Wrap Count

Shows the number of times that the MST buffer has wrapped around. If the tracer is running in the wrap around mode, a number from 0-99 will appear and indicates how many times the MST data capture buffer has been filled. A dash indicates that the count is greater than 99, but there is no limit to the number of times the buffer can wrap around. If wrap-around mode is not enabled, field 5 contains a 0.

Field 6 — Percent Full

Shows what percentage of the MST buffer is full for the current active trace. Note that upon receipt of the first message, the percent is bumped from 0 to 1 percent to show that the buffer is beginning to fill. From this point on, the number represents the actual percent-full measurement.

Field 7 — Trigger Status

Shows what the current trigger status is.

0=No trigger or count specified
l=Looking for on trigger to fire
2=Looking for off trigger to fire
3=Implementing the count function
4=Count function and looking for on trigger
5=On trigger occurred
6=Off trigger occurred

Field 8 — Completion Code

Shows why the trace stopped. You may have entered "s", the timer may have expired, the MST data capture buffer may have filled up with the non-wrap option set, an off-trigger might have fired with the retrigger option not set, or the specified count (from test 5) might have been reached.

l=You entered stop
2=Timer expired
3=Buffer is full
4=Off trigger hit or count expired

Fields 9-13 — Stop Time For Current Trace

Shows the anticipated stop time if the trace is enabled or the actual stop time. Shows when the tracer will be disabled (you can select a run time in test 5). If the tracer becomes disabled, fields 9-13 show the actual stop time. If you manually enable the tracer, a new time will be computed based on the run time you entered in Test 5. Time measurements are based on the system clock setting.

Field 9 is the month (1-12)
Field 10 is the day (1-31)
Field 11 is the hour (-, 0-23)
Field 12 is the minute (-, 0-59)
Field 13 is the second (-, 0-59)

Field 14— ISDN Buffer Status

Reserves the data capture buffer for ISDN MST use only, preventing an overwrite of the data in the ISDN trace buffer by the DCIU tracer. The DCIU tracer cannot be enabled if the ISDN buffer is reserved.

0=Not reserved
l=Reserved

TEST 2

Use test 2 to display successive messages captured in the ISDN MST data capture buffer without displaying the data for each message and to enable or disable the ISDN MST.

To View the Test 2 Screen

To see the test 2 screen, enter **t2** from any point within procedure 959.   The test 2 screen, similar to the following, appears:

```
                      ENHANCED MODE-PROCEDURE : 949, TEST : 2
                              EXAMINE ISDN MESSAGES


 2. Scroll Direction: ❏
 3.     Scroll Steps: ❏
ISDN MESSAGE
   4.          Message: ❏
   5. Message Direction: ❏


ISDN MESSAGE
   6.          Message: ❏
   7. Message Direction: ❏


ISDN MESSAGE
   8.          Message: ❏
   9. Message Direction: ❏


ISDN MESSAGE
  10.          Message: ❏
  11. Message Direction: ❏

Connected to CC0 ON-LINE ♡ ┌ MAJOR ┐┌ MINOR ┐┌ RUN TAPE ┐┌ BUSY OUT ┐┌ IN USE ┐┌ WAIT ┐


enter command: ▭
┌───────┐┌───────┐┌ 3 Data ┐┌───────┐┌ 5 Help ┐┌ 6 Field ┐┌ 7 Input ┐┌ 8 Cmds ┐
```

To Select Scroll Direction and Steps

1. Enter **cf2** and enter **1** if you want to scroll forward or enter **2** if you want to scroll backward.

    Scrolling forward means messages, in the order from oldest to newest, enter the display from the bottom (fields 10 and 11) and fill upward. Scrolling backward means messages, in the order from newest to oldest, enter the display from the top (fields 4 and 5) and fill downward.

2. Enter **cf3** and enter the number of steps you want to scroll by. You can scroll by either 1 or 4 messages. Scrolling by four is the same as scrolling by one four times.

To Examine ISDN Messages

The **nu** operation scrolls through the messages captured in the data capture buffer. Note that if the buffer has wrapped around, the oldest messages are overwritten when the buffer fills. Also, if the wrap option is not set and the buffer fills up, the MST is disabled. In both cases, if you are scrolling as new messages are being captured, each time you reach the newest message in the buffer, that message will be different from the newest message you viewed the time before. The following example shows how scrolling works in the most common case — the buffer is static (no more messages are being captured), and is not full:

Assume five messages, labeled message 1, message 2... message 5, have been captured. Also assume that message 1 is the oldest message, message 2 the next oldest and so on.

- When scrolling forward by 1, the following will be displayed:
  - Assume the initial display shows message 1 in fields 10-11 with fields 4-9 dashed. This is a typical initial display immediately after the trace has been run.
  - After the first **nu,** message 2 will be displayed in fields 10-11 and message 1 will be displayed in fields 8-9.
  - Each **nu** brings the newest message into fields 10-11 and moves the others up.
  - After the fourth **nu,** message 5 is displayed in fields 10-11, message 4 in fields 8-9, message 3 in fields 6-7, and message 2 in fields 4-5. The next **nu** then dashes fields 10-11, moving the messages up as before.
  - Two more **nu** operations yields message 5 in fields 4-5 and the rest dashed.
  - The next **nu** then displays message 1 again in fields 10-11 with fields 4-9 dashed.
- When scrolling forward by four, the following will be displayed:
  - Again, assume the initial display shows message 1 in fields 10-11 with fields 4-9 dashed. This is a typical initial display immediately after the trace has been run.
  - Pressing **nu** then displays message 2 through message 5 in fields 4-11 respectively.
  - Pressing **nu** again returns to the initial display.
- Scrolling backward by one yields the following displays
  - Assume the initial display shows message 5 in fields 4-5 with fields 6-11 dashed. This is a typical initial display immediately after the trace has been run.
  - Each successive **nu** operation pushes message 5 down, bringing in message 4, message 3, etc. from the top.
  - After four **nu** operations, message 1 is in fields 4-5, message 2 is in fields 6-7,..., and message 4 is in fields 10-11.
  - The next **nu** pushes the messages down, dashing fields 4-5.
  - Two more **nu** operations yields message 1 in fields 10-11 and fields 4-9 dashed.
  - The next **nu** then yields message 5 in fields 4-5 with the rest dashed.
- Scrolling backward by 4 yields the following displays:
  - Assume that initially message 5 is displayed in fields 4-5 with the rest dashed.

— Pressing **nu** will yield message 1 through message 4 in fields 4-11 respectively.

— The next **nu** operation will again yield the initial display.

From any point within the scroll, you can jump back to the beginning of the scroll, by entering **dx** twice.

You can carry a single message from this test to test 3. If you are scrolling forward and you enter **t3** to go to test 3, the message appearing in fields 10-11 will be displayed when you enter test 3. If you are scrolling backward, the message appearing in fields 4-5 will be displayed when you enter test 3.

Likewise, the message displayed in test 3 will be displayed upon entering test 2. If the scroll direction is forward, the message will be displayed in fields 10-11. If the scroll direction is backward, the message will be displayed in fields 4-5. Note that the scroll direction and search direction in test 2 and 3 are always the same — if you change one, the other automatically changes to match it.

Note that if you change the search direction in test 3, you might get the initial display (first or last message in the buffer with the other six fields dashed) upon returning to test 2. This happens if you change search directions and cross the beginning or end-of-buffer boundary.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

    The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

    If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains DCIU data and you start an ISDN trace all DCIU data will be lost.

    The tracer continues to gather data until you enter **s** , until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter **s.**

    If you enter **s** you will override any preset options and immediately stop the tracer.

    Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from the point where it stopped, enter **x x** again.

Input Fields

You can enter data in the following fields.

● You can select the scroll direction (forward or backward) in field 2.

● You can select the scrolling step in field 3.

Field 2 — Scroll Direction

Shows the direction you are scrolling (forward or backward). The default direction is forward (the lowest numbered fields contain the oldest information).

1=Scroll forward
2=Scroll backward

Field 3 — Scroll Steps

Shows the message type increments (one or four) that you use to step through the data. The default scrolling step is one.

l=Scroll by 1
4=Scroll by 4

Fields 4, 6, 8, 10 — ISDN Message

The code for the message type is displayed in these fields. The possible messages for a given code are displayed to the right of the field. You must observe the L2/L3 indicator in test 3 to determine which message was captured if there is more than one possibility. For example, using the table below, if the code 7 is displayed, the message type could be connect, service ack, or MDL_Traffic_Request.

The following table shows the codes for the message types. Note that the level 2 primitives are messages that are not transmitted over the ISDN PRI link. They are messages transmitted between the ISDN PRI circuit pack and the system's common control software. An outgoing level 2 primitive is transmitted from the common control to the circuit pack and an incoming level 2 primitive is transmitted from the circuit pack to the common control. Also note that the encode is decimal coded hex, ranging from 0000 to 1515, corresponding to the hex values 00 to FF. For example, 214=2E hex, 1205=C5 hex, and 206=26 hex.

Encode	Call Control	Maintenance	Level 2 Primitive
1	Alerting		DL_Establish_Request (outgoing)
2	Call Proc		DL_Release_Request (outgoing)
3	Progress		DL_Data_Request (outgoing)
4			DL_Unit_Data_Request (outgoing)
5	Setup		MDL_Error_Request (outgoing)
6			MDL_Test_Request (outgoing)
7	Connect	Service ack	MDL_Traffic_Request (outgoing)
8			MDL_Check_Request (outgoing)
9			MDL_Sett_Request (outgoing)
10			MDL_Assign_Request (outgoing)
12			MDL_Remove_Request (outgoing)
13	Setup ack		
15	Connect ack	Service	
200	User info		
201	Suspend reject		
202	Resume reject		

Encode	Call Control	Maintenance	Level 2 Primitive
205	Suspend		
206	Resume		
213	Suspend acknowledge		
214	Resume acknowledge		
401			DL_Establish_Indication (incoming)
402			DL_Release_Indication (incoming)
405	Disconnect		MDL_Error_Indication (incoming)
406	Restart		
408			MDL_Check_Indication (incoming)
413	Release		
414	Restart acknowledge		
510	Release complete		
600	Segment		
602	Facility		
604	Register		
610	Facility acknowledge		
614	Notify		
702	Facility reject		
705	Status enquiry		
709	Congestion control		
711	Information		
713	Status		
1201			DL_Establish_Confirmation (incoming)
1202			DL_Release_Confirmation (incoming)
1205			MDL_Error_Confirmation (incoming)
1206			MDL_Test_Confirmation (incoming)
1207			MDL_Traffic_Confirmation (incoming)
1208			MDL_Check_Confirmation (incoming)

Fields 5, 7, 9, 11 — Message Direction

0=Outgoing
l=Incoming

TEST 3

Use test 3 to step through the messages, as in test 2, but also to further examine the data captured for these messages. You can also enable or disable the MST in this test.

To View the Test 3 Screen

To see the test 3 screen, enter **t3** from any point within procedure 949. The test 3 screen, similar to the following, appears:

```
                    ENHANCED MODE-PROCEDURE: 949, TEST : 3
                           INSPECT  ISDN  MESSAGES

 2. Search Direction: ⬚
 3.   L2/L3 Indicator: ⬚
 4.     Message Type: ⬚


EVENT  TIME,  SPECIAL  DATA  OR  TRACE  DATA
   5.          Hour I Special  Data I Trace  Data: ⬚
   6.        Minute I Special  Data I Trace  Data: ⬚
   7.        Second I Special  Data I Trace  Data: ⬚
   8. Centisecond I Special  Data I Trace  Data: ⬚
   9.           Day I Special  Data: ⬚
```

```
Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▭
|_____||_____|| 3 Data ||_____|| 5 Help || 6 Field || 7 Input || 8 Cmds |
```

To Select Search Direction

Enter **cf2** and enter **1** if you want to search forward or enter **2** if you want to search backward.

Searching forward means you display successively newer messages. Searching backward means you display successively older messages.

Note that you can step through messages as data is being entered into the buffer, meaning that when searching backward, the newest message is the newest message at that point in time.

To Examine ISDN Messages

1. Fields 3-9 display data for a message in the data capture buffer. Field 9 tells you which of the three kinds of data is in fields 5-9 as follows:

    — If field 9 contains a number from 1 to 31, the data is a time stamp and field 9 represents the day.

    — If field 9 contains a dash, the data in fields 5-8 is trace data (data that is actually transported over the ISDN link or between the circuit pack and the common control).

    — If field 9 contains a 99, fields 5-8 contain special data (internal switch data that is not transported via a message).

2. If you carried a message over from test 2, data for that message will be displayed in fields 3-9 when you enter test 3. Otherwise, all fields will be dashed.

3. Enter **nu** to step through the messages captured in the ISDN MST data capture buffer.

    — If the search direction is forward and no message is carried over, the first message displayed is the oldest message in the buffer, then the next oldest and so on.

    — If the search direction is backward and no message is carried over, the first message displayed is the newest message in the buffer, then the next newest and so on.

    After you view all ISDN messages, fields 3-9 are dashed. If you enter **nu** again, the first ISDN message appears in fields 3-4 with the time stamp data in fields 5-9. If time stamps are not enabled, fields 5-9 are dashed.

4. For a given message specified by fields 3 and 4, enter **nd** to step through the three types of data in fields 5-9. For example, if the time stamp data is displayed, entering **nd** will display special data for that message — another **nd** will then display trace data for that message. After you step through all the trace data associated with the current event code, the switch will dash the data fields. If you enter **nd** again, the time stamp will again appear (if applicable).

    If you are viewing an abbreviated Q.931 message set, the following data is displayed:

    The protocol discriminator octet, the length of the call reference value octet, the actual call reference value octets, and the message type. If cause information elements and channel ID elements are in the message, they will also be displayed.

5. If you want to go back to the beginning of the trace to view data again without having to step through the entire trace, enter **dx** twice.

    Note that the beginning is defined by the search direction in field 2.

6. If you enter test 2, the message currently displayed in test 3 will be displayed upon entering test 2. If the scroll direction is forward, the message will be displayed in fields 10-11 of test 2. If the scroll direction is backward, the message will be displayed in fields 4-5. Note that the scroll direction and search direction in tests 2 and 3 are always the same — if you change one, the other automatically changes to match it.

7. Likewise, the message currently displayed in test 2 will be displayed in test 3 when you enter test 3. If the scroll direction is backward, the message in fields 4-5 of test 2 will be displayed in test 3. If the scroll direction is forward, the message in fields 10-11 of test 2 will be displayed in test 3.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

   The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

   If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains DCIU data and you start an ISDN trace all DCIU data will be lost.

   The tracer continues to gather data until you enter **s,** until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter **s.**

   If you enter **s** you will override any preset options and immediately stop the tracer.

   Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from the point where it stopped, enter **x x** again.

Input Fields

You can enter data in the following fields.

• You can select the search direction (forward or backward720) in field 2.

Field 2 — Search Direction

Controls the search direction. The default is forward (oldest data first).

l=Search forward
2=Search backward

Field 3 — L2/L3 Indicator

Shows whether the message is a call control message, a maintenance message, a level 2 primitive, an unknown message, or a gap marker. Test 5 contains options for capturing each message type (except gap markers). When used in conjunction with the message type in field 4 and the table below, the L2/L3 indicator allows you to determine the exact message.

0=Gap marker
2=Level 2 primitive
3=Q.931 maintenance
8=Q.931 call control
9=Unknown

Field 4 — Message Type

The following table shows the codes for the message types. Note that the level 2 primitives are messages that are not transmitted over the ISDN PRI link. They are messages transmitted between the ISDN PRI circuit pack and the system's common control software. An outgoing level 2 primitive is transmitted from the common control to the circuit pack and an incoming level 2 primitive is transmitted from the circuit pack to the common control. Also note that the encode is decimal coded hex, ranging from 0000 to 1515, corresponding to the hex values 00 to FF. For example, 214=2E hex, 1205=C5 hex, and 206=26 hex.

Encode	Call Control	Maintenance	Level 2 Primitive
1	Alerting		DL_Establish_Request (outgoing)
2	Call Proc		DL_Release_Request (outgoing)
3	Regress		DL_Data_Request (outgoing)
4	.		DL_Unit_Data_Request (outgoing)
5	Setup		MDL_Error_Request (outgoing)
6			MDL_Test_Request (outgoing)
7	Connect	Service ack	MDL_Traffic_Request (outgoing)
8			MDL_Check_Request (outgoing)
9			MDL_Sett_Request (outgoing)
10			MDL_Assign_Rquest (outgoing)
12			MDL_Remove_Request (outgoing)
13	Setup ack		
15	Connect ack	Service	
200	User info		
201	Suspend reject		
202	Resume reject		
205	Suspend		
206	Resume		
213	Suspend acknowledge		
214	Resume acknowledge		
401			DL_Establish_Indication (incoming)
402			DL_Release_Indication (incoming)
405	Disconnect		MDL_Error_Indication (incoming)
406	Restart		
408			MDL_Check_Indication (incoming)
413	Release		
414	Restart acknowledge		
510	Release complete		
600	Segment		
602	Facility		
604	Register		
610	Facility acknowledge		
614	Notify		
702	Facility reject		
705	Status enquiry		
709	Congestion control		
711	Information		
713	Status		
1201			DL_Establish_Confirmation (incoming)

Encode	Call Control	Maintenance	Level 2 Primitive
1202			DL_Release_Confirmation (incoming)
1205			MDL_Error_Confirmation (incoming)
1206			MDL_Test_Confirmation (incoming)
1207			MDL_Traffic_Confirmation (incoming)
1208			MDL_Check_Confirmation (incoming)

Fields 5-9

Fields 5-9 provide three types of data for the message displayed in fields 3 and 4. The type of data displayed — time stamp, special data, or link data — is determined by the contents of field 9, as follows:

- If field 9 contains a number from 1 to 31, the data is a time stamp and field 9 represents the day.

- If field 9 contains a dash, the data in fields 5-8 is trace data (ISDN messages). The data shown in each field is the value of a single octet (byte) of the message, starting with the first octet. The values in the octet can range from 0 to FF hex, which are coded in decimal. For example:
  BF   hex=l115
  EA hex=l410
  CD hex=l213
  F2   hex=1502
  95   hex=9 05

- If field 9 contains a 99, fields 5-8 contain special data, which is the port equipment number of the port over which ISDN messages are being transported.

- If fields 5-9 all contain dashes after an nd operation, the end of the list for that type of data has been reached.

TEST 4

Use test 4 to build the primary filter (or examine an existing primary filter) for capturing ISDN message data. A filter specifies what kind of data you want to capture in the buffer for messages associated with a given string of calling/called party digits, ISDN PRI port, or ISDN PRI facility. For example, you might want to capture only incoming ISDN calls to a given extension over a given B channel, filtering out all other types of messages. Additional filters are defined in test 5.

To View the Test 4 Screen

To see the test 4 screen, enter t4 from any point within procedure 949. The test 4 screen, similar to the following, appears:

```
              ENHANCED MODE-PROCEDURE : 949, TEST : 4
                      SETUP ISDN PRIMARY FILTERS

  2.  Incoming Call-Calling: ▢
  3.   Incoming Call-Called: ▢
  4.  Outgoing Call-Calling: ▢
  5.   Outgoing Call-Called: ▢


B or D CHANNEL EQUIPMENT LOCATION
    6. Module : ▢
    7. Cabinet: ▢
    8. Carrier: ▢
    9.    Slot : ▢
   10. Circuit: ▢

 11. Channel: ▢
 12.   Spans : ▢




Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │

enter command: ▭
 ┌────────┐┌────────┐┌─────────┐┌────────┐┌─────────┐┌─────────┐┌─────────┐┌────────┐
 └────────┘└────────┘│3 Data   │└────────┘│5 Help   ││6 Field  ││7 Input  ││8 Cmds  │
```

You can use the filters to:

1. Monitor ISDN PRI message flow for specific dialing patterns as follows:

   • Incoming Call-Calling Party

   • Incoming Call-Called Party

   • Outgoing Call-Calling Party

● Outgoing Call-called Party

The dialed digit strings are specified in Test 7. Digit strings can be specified along with an equipment location or by themselves.

2. Monitor D channel ISDN PRI message flow for a specific B channel.

3. Monitor all ISDN PRI message flow for a specific facility-associated (FAS) D channel.

4. Monitor all ISDN PRI message flow for a specific non-facility-associated (NFAS) D channel.

5. Monitor all ISDN PRI message flow for a specific PRI interface (circuit pack).

6. Monitor all ISDN PRI message flow in the system.

Note that you must disable the tracer while selecting a filtering group. You cannot select the filter while the tracer is enabled (the **cx** function will not work if you try to implement the data entry). Enters from tests 1, 2, 3, or 5 to disable the tracer.

To Build a Filter

1. To monitor ISDN messages by dial pattern, enter **cf** and the number of the field (2-5) that you want to change.

2. Enter the digit string number in the fields you selected and then enter **cx.**

Note that if you enter a digit string, it must be one you built in test 7.

3. To select the equipment location, choose one of the following followed by **cx:**

● If you want to capture all level 3 messages for the B Channels on the PRI interface (also called PRU circuit pack or span), enter **cf6** and select the module, cabinet, carrier, and slot.

● If you want to select a FAS D channel equipment location, select the module, cabinet, carrier, slot, and circuit of the D channel. This will capture messages for the B channels controlled by that D channel, which, in the case of a FAS D channel, means all the B channels on that board. An equivalent way to do this is to simply select the module, cabinet, carrier and slot of the board.

● If you want to select an NFAS D Channel equipment location, enter the module, cabinet, carrier, slot and circuit of the NFAS D channel.

Field 12 shows the number of interfaces associated with the D channel you selected. If you select an NFAS D channel, high trace activity is likely.

● If you want to select a B channel, enter the module, cabinet, carrier, slot, and circuit of the B channel.

● If you want to select all D channels in the system, dash fields 6-10.

● Enter **nu** to select the next translated ISDN PRI interface by equipment location.

● Enter **nc** to see the next translated channel on the displayed ISDN PRI interface.

Input Fields

You can enter data in the following fields.

● Using digit strings specified in test 7, you can specify, in fields 2-5, digit analysis for any combination as follows:

— incoming call-calling number

— incoming call-called number

— outgoing call-calling number

— outgoing call-called number

● You can select an equipment location in fields 6-10.

Field 2 — Digit Analysis for Incoming Calls from Calling Party Number

This field consists of a digit string number built in test 7. The range is from 1 to 9. For example, assume in test 7 you defined digit string 5 as 3035381200. Entering **5** in field 2, then, means you are capturing all incoming messages from 303-538-1200.

Field 3 — Digit Analysis for Incoming Call to Called Party Number

This field consists of a digit string number built in test 7. The range is from 1 to 9. For example, assume in test 7 you defined digit string 6 as 3035381201. Entering **6** in field 3, then, means you are capturing all incoming messages to 303-538-1201

Field 4 — Digit Analysis for Outgoing Calls from Calling Party Number

This field consists of a digit string number built in test 7. The range is from 1 to 9. For example, assume in test 7 you defined digit string 7 as 3035381202. Entering **7** in field 4, then, means you are capturing all outgoing messages from 303-538-1202.

Field 5 — Digit Analysis for Outgoing Calls to Called Party Number

This field consists of a digit string number built in test 7. The range is from 1 to 9. For example, assume in test 7 you defined digit string 8 as 3035381203. Entering **8** in field 5, then, means you are capturing all outgoing messages to 303-538-1200.

Fields 6-70 — B or D Channel Equipment Location

These fields are used to select the B channels or D channels for which you want to capture messages. These fields show the module, cabinet, carrier, slot and circuit location of the B or D channel being traced. You can specify this in several different ways, as follows:

— If you want to capture messages associated with a single B channel, enter the equipment location, down to the circuit, of that B channel. Note that if you display field 10 by the **nc** operation, field 11 displays the circuit number, whether it is a B channel or D channel. If, however, you specify field 10 with the **cf** operation, field 11 is dashed.

— If you want to capture messages on all B channels controlled by a particular D channel, enter the equipment location of that D channel down to the circuit.

Note that if the D channel is administered as an NFAS D channel, you maybe capturing messages for a large number of B channels. If you specify an NFAS D channel here, field 12 shows you how many spans (ISDN PRI circuit packs of 24 channels each) are controlled by that D channel.

— If you want to capture messages on all B channels on a PRI circuit pack (span, or interface), enter the equipment location of that interface down to the slot number.

— If you want to monitor all ISDN messages on the system, dash fields 6-10.

Field 11 — Channel

Shows the channel number on the span of the circuit you specified in field 10. Note that if you display field 10 by the nc operation, field 11 displays the circuit number, whether it is a B channel or D channel. If, however, you specify field 10 with the **cf** operation, field 11 is dashed.

Field 12 — Spans

Shows the number of spans (PRI boards) on the D channel you selected if you specified an NFAS D channel.

Circuit-to-Channel Reference

The following table shows the correspondence between the equipment location of a circuit and the ISDN PRI channel number for a traditional module:

Channel	Slot/Circuit	Channel	Slot/Circuit
1	5/0 or 18/0	13	0/0 or 13/0
2	6/0 or 19/0	14	1/0 or 14/0
3	7/0 or 20/0	15	2/0 or 15/0
4	5/1 or 18/1	16	0/1 or 13/1
5	6/1 or 19/1	17	1/1 or 14/1
6	7/1 or 20/1	18	2/1 or 15/1
7	5/2 or 18/2	19	0/2 or 13/2
8	6/2 or 19/2	20	1/2 or 14/2
9	712 or 20/2	21	2/2 or 15/2
10	5/3 or 18/3	22	0/3 or 13/3
11	6/3 or 19/3	23	1/3 or 14/3
12	7/3 or 20/3	24	2/3 or 15/3
Note: Channel 24 is the D channel.			

The following table shows the correspondence between the equipment location of a circuit and the ISDN PRI channel number for a universal module:

Channel	Slot/Circuit	Channel	Slot/Circuit
1	*/0	13	*+1/0
2	*/1	14	*+1/1
3	*/2	15	*+ 1/2
4	*/3	16	*+l/3
5	*/4	17	*+1/4
6	*/5	18	*+ 1/5
7	*/6	19	*+ 1/6
8	*/7	20	*+ 1/7
9	*/8	21	*+1/8
10	*/9	22	*+ 1/9
11	*/10	23	*+1/10
12	*/11	24	*+1/11

Notes:
1. * equals any slot for TN767 except slot one in the universal port carrier.
2. *+1 equals the next slot to TN767 for TN555.
3. Channel 24 is the D channel.

TEST 5

Use test 5 to set up additional ISDN filters, MST data capture buffer control options, and gating controls, to look at the enabled/disabled status of the tracer, and to enable or disable the MST.

The filters set in fields 2-5 allow you to capture only specified kinds of messages.

The buffer options set in fields 6-10 set several parameters involved with how the buffer captures data and makes it available for display. For example, if you want to see only a part of each captured message, field 6 can be set to capture only an abbreviated portion of each message.

The gating options set in fields 11-14 determine when and for how long data will be captured based on the triggers built in test 6 and on the number of messages you want to capture. For example, you can begin capturing messages based on the detection of a certain message or sequence of messages (ON trigger) and quit capturing messages starting with a given number of messages after a certain message or sequence of messages is detected (OFF trigger plus count).

To View the Test 5 Screen

To see the test 5 screen, enter **t5** from any point within procedure 949. The test 5 screen, similar to the following, appears:

```
                    ENHANCED MODE-PROCEDURE: 949, TEST: 5
    SETUP ADDITIONAL ISDN FILTERS, BUFFER CONTROL OPTIONS AND GATING CONTROLS


FILTERS
    2.          Call Control: ❑
    3. Maintenance Messages: ❑
    4.      Level 2 Primitive: ❑
    5. Unknown Message Type: ❑
BUFFER OPTIONS
    6. Message Set: ❑
    7.  Time Stamp: ❑
    8. Wrap Enable: ❑
    9.  Timer Code: ❑
   10.   Run Time: ❑
GATING OPTIONS
   11.      ON Trigger: ❑
   12.     OFF Trigger: ❑
   13.         Count : ❑
   14. Retrigger Status: ❑
15. Enable Status: ❑


Connected to CC0 ON-LINE ♡ ┃ MAJOR ┃┃ MINOR ┃┃ RUN TAPE ┃┃ BUSY OUT ┃┃ IN USE ┃┃ WAIT

enter command: ▭
┃        ┃┃       ┃┃3 Data ┃┃       ┃┃5 Help ┃┃6 Field ┃┃7 Input ┃┃8 Cmds ┃
```

To Set Up Additional ISDN Filters, Buffer Control Options, and Gating Controls

1. Enter **cf** and the number of the input field you want to change. Note that the MST must be disabled otherwise you will be blocked when you try to perform a **cx.**

2. Select an encode for the field you want to change.

3. Enter **cx** to implement the change.

4. To back out of the change, enter **dx** any time before you enter **cx** The current settings appear.

The status indicator will show enabled/disabled status of the ISDN MST.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

   The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

   If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains DCIU data and you start an ISDN trace all DCIU data will be lost.

   The tracer continues to gather data until you enter **s,** until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter **s.**

   If you enter **s** you will override any preset options and immediately stop the tracer.

   Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from the point where it stopped, enter **x x** again.

Input Fields

You can enter data in the following fields.

- You can select whether you want to trap call control messages in field 2.

- You can select whether you want to trap maintenance messages in field 3.

- You can select whether you want to trap level 2 primitives in field 4.

- You can select whether you want to trap unknown messages in field 5.

- You can select whether you see the full message set or an abbreviated message set in field 6.

- You can enable or disable the time stamps in field 7.

- You can select whether you want to stop when the MST data capture buffer fills or continue to wrap around in field 8.

● You can select the run time in fields 9 and 10.

● You can select one of the ON triggers you created in Test 6 in field 11.

● You can select one of the OFF triggers you created in Test 6 in field 12.

● You can select a message COUNT in field 13 to associate with the ON/OFF triggers.

● You can select whether you want to retrigger in field 14.

Field 2 — Call Control

0=Do not trap call control messages
l=Trap call control messages

Field 3 — Maintenance Messages

0=Do not trap maintenance messages
l=Trap maintenance messages

Field 4 — Level 2 Primitive

0=Do not trap level 2 primitives
1=Trap level 2 primitives

Field 5 — Unknown Message Type

0=Do not trap unknown message types
l=Trap unknown message types

Field 6 — Message Set

The abbreviated message set is the default. If the tracer is enabled, all data through the selected primary and secondary filters will be captured under control of this option. If the full message set option is selected, all data will be captured. If the abbreviated message set option is selected, the data collected will be the first five octets of each message on all messages as well as the cause code for clearing messages or channel number for SETUP messages.

l=Abbreviated message set
2=Full message set

Field 7 — Time Stamp

Time stamps are a very useful trouble tracking tool, however, there maybe cases where they are not needed and the buffer space could be better utilized if the time stamps were turned off. If time stamps are enabled, they appear in test 3 when you are viewing the captured messages.

0=Disable Time Stamps
l=Enable Time Stamps

Field 8 — Wrap Enable

The tracer will either run up until the buffer is full (if all other parameters allow it) or run continuously (if all other parameters allow it). If you select wrap around, the oldest data will be overwritten.

l=Do not exceed buffer size
2=Wrap around (the oldest data is lost)

Field 9 — Timer Code

Shows the units of measure for the run time of the tracer. For example, if you enter 2 in field 9, and you enter 10 in field 10, the trace will stop after 10 minutes from the time it is enabled.

l=Seconds
2=Minutes
3=Hours
4=Days

Field 10 — Run Time

You must select a run time to control the maximum amount of time the tracer can run.

l-99=Number of units as specified in field 9

Fields 11-14 — Gating Options

You can use the gating options in these fields in conjunction with the triggers you built in test 6 to take a controlled "snapshot" of the trace. Following are some examples of different ways to do this:

- You can start capturing messages, beginning with the last message of an ON trigger, and continue to capture messages through the tenth message after the last message of an OFF trigger (assuming the run time has not been exceeded), and run the trace again on each successive occurrence of the ON trigger. In this example, field 11 is a trigger number defined in test 6, field 12 is a trigger number defined in test 6, field 13 is 10 and field 14 is 1.

- You can begin capturing messages starting with the last message of an ON trigger and capture eight additional messages. In this example, field 11 is a trigger number defined in test 6, field 12 is dashed, field 13 is 8, and field 14 is 0.

Note that the retrigger option is meaningful only if the tracer is turned on by an ON trigger (field 1l=a defined trigger number from test 6) and an OFF trigger (field 12=a defined trigger number from test 6) or a COUNT (field 13=a number from 1 to 999).

Field 11 — ON Trigger

dash=No trigger specified
l-9=Trigger specified. This is the number of a trigger you built in test 6. For example, if you want trigger number 4 to be the ON trigger for this trace, enter 4 in field 11.

Note that if an ON trigger is specified, the MST will capture only the last message of the ON trigger, which can be a sequence of up to six messages.

Field 12 — OFF Trigger

dash=No trigger specified
l-9=Trigger specified This is the number of a trigger you built in test 6. For example, if you want trigger number 5 to be the OFF trigger for this trace, enter 5 in field 12.

Note that if an OFF trigger is specified without a count, all messages of the OFF trigger will be captured.

Field 13 — Count

dash=No count specified
l-999=Count

If an OFF trigger is specified, the count always means to capture messages until count number of messages after the last message of the OFF trigger is detected.

If an ON trigger is specified without an OFF trigger, count means to capture the last message of the ON trigger plus COUNT number of additional messages.

If neither an ON trigger or an OFF trigger are specified, count means to capture count number of messages after enabling the tracer.

Field 14 — Retrigger Status

If the retrigger option is set, the tracer will automatically be re-enabled if the conditions are valid. The valid conditions are:

- ON trigger and OFF trigger specified

- ON trigger and COUNT specified

- ON trigger, OFF trigger and COUNT specified

0=Do not retrigger
l=Retrigger

Fields 11 through 14 Summary

The following table summarizes how the tracer acts based on all the possible combinations of fields 11-14 settings:

Gating Control Specification-1=data, 0=no data specified				
Field 11	**Field 12**	**Field 13**	**Field 14**	**Tracer Operation**
0	0	0	0	Manual Operation
0	0	0	1	Invalid without ON and (OFF or COUNT)
0	0	1	0	Manual ON-Off on COUNT
0	0	1	1	Invalid without ON
0	1	0	0	Manual ON/Auto OFF
0	1	0	1	Invalid without ON
0	1	1	0	Manual ON/ Auto OFF on COUNT
0	1	1	1	Invalid without ON
1	0	0	0	Auto ON/ Manual OFF
1	0	0	1	Invalid without OFF or COUNT
1	0	1	0	Auto ON-Off on COUNT
1	0	1	1	Auto ON (RESTART)/-Off on COUNT
1	1	0	0	Auto ON/Auto OFF
1	1	0	1	Auto ON (RESTART)/Auto OFF
1	1	1	0	Auto ON/Auto OFF on COUNT
1	1	1	1	Auto ON (RESTART)/Auto OFF on COUNT

Field 15 — Enable Status

0=Tracer disabled
l=Tracer enabled

TEST 6

Use Test 6 to do the following:

- You can build triggers that are used in test 5 to turn the tracer on and/or off.

  — A trigger is a sequence of one to six trigger elements defined in fields 5-12. A trigger element consists of any meaningful combination of message type, L2/L3 indicator, message direction, and cause value, which is data contained within the message.

  — Each set of four fields (fields 5-8 and 9-12) define one element of the trigger. The first two elements can be thus displayed in fields 5-12. This is called segment 1. The third and fourth trigger elements, if defined, are defined by fields 5-12 in segment 2. The fifth and sixth trigger elements, if defined, are defined by fields 5-12 in segment 3.

  — When this sequence of trigger elements is detected, the tracer either begins capturing messages or quits capturing messages depending on how fields 11, 12, and 13 in test 5 are set.

- The triggers to be used in the trace are specified in fields 11 and 12 of test 5.

To View the Test 6 Screen

To see the test 6 screen, enter **t6** from any point within procedure 949. The test 6 screen, similar to the following, appears:

```
┌──────────────────────────────────────────────────────────────────────┐
│                ENHANCED  MODE-PROCEDURE  :  949,  TEST  :  6           │
│            BUILD  ISDN  TRIGGERS  FOR  MESSAGE  SEQUENCE  TRACER  GATING │
│                                                                        │
│  2. Selected Trigger ☐                                                 │
│  3.     Build Trigger ☐                                                │
│  4.        segment: ☐                                                   │
│                                                                        │
│  TRIGGER  ELEMENT                                                      │
│     5.          Message: ☐                                             │
│     6.    L2/L3 Indicator: ☐                                           │
│     7. Message Direction: ☐                                            │
│     8.           Cause: ☐                                              │
│                                                                        │
│  TRIGGER  ELEMENT                                                      │
│     9.          Message: ☐                                             │
│    10.    L2/L3 Indicator: ☐                                           │
│    11. Message Direction ☐                                             │
│    12.           Cause: ☐                                              │
│                                                                        │
│                                                                        │
│  Connected to CC0 ON-LINE ♡ │ MAJOR ││ MINOR ││ RUN TAPE ││ BUSY OUT ││ IN USE ││ WAIT │ │
│ ─────────────────────────────────────────────────────────────────── │
│  enter command: ▭                                                      │
│  │      ││      ││ 3 Data ││      ││ 5 Help ││ 6 Field ││ 7 Input ││ 8 Cmds │ │
└──────────────────────────────────────────────────────────────────────┘
```

ToDisplayTriggers

1. Enter **cf 2** and then enter trigger number from one to nine.

2. Enter **dx** to see the first segment of the trigger.

3. Enter **nu** to step through each trigger in the current list of triggers. Each **nu** displays the first segment of the next trigger.

    After you view all triggers, the switch dashes all fields. If you enter **nu** again, the first trigger appears.

4. Enter **nd** to view data segments for the trigger number displayed in field 2. Trigger elements 1 and 2 occur in segment 1, trigger elements 3 and 4 in segment 2, and trigger elements 5 and 6 in segment 3. You can also decide which segment of the trigger you want to display by entering **cf 4** and either **1, 2** or **3** for the segment number you want to display.

To Build or Modify a Trigger

To build or modify a trigger, do the following:

1. Enter **cf 3** and then enter a trigger number from one to nine.

2. If you are building or modifying the first two trigger elements of the trigger, enter **1** in field 4. If you are building or modifying trigger elements 3 or 4 of the trigger, enter **2** in field 4. If you are building or modifying trigger elements 5 or 6 of the trigger, enter **3** in field 4.

3. In fields 5 through 12 enter each message code of the trigger, the L2/L3 indicator to distinguish the message for the particular code, the message direction (incoming or outgoing), and the cause value. These values are placed in the scratchpad memory.

4. Note that, unless you want a complete wildcard trigger element, you must enter data in all fields of a trigger element from the point at which you start entering to the end of the trigger element, even if you want those fields dashed. This rule applies whether you are building a new trigger or modifying an existing trigger. For example, if you are modifying a trigger and the only difference is the entry in field 6, you must reenter the data in fields 7 and 8 also, even if fields 7 and 8 are dashed.

   The only exception to this rule is if a trigger element is all dashed, meaning that trigger element is a total wildcard (fields 9-12 are dashed, for example). In this case you do not have to enter any data in those fields.

5. After you enter all the data to build the trigger, enter **cx** to place the scratchpad into permanent memory.

6. Enter **nd** to display the three segments for the displayed trigger number.

Following are rules for wildcards in triggers:

- If all fields of a trigger element in a trigger are dashed, that trigger element is a wildcard. For example, assume a trigger consists of the following:

  Segment 1:
  Field 5=5
  Field 6=8
  Field 7=0
  Field 8=dash
  Fields 9-12=dashed

  Segment 2:

  Field 5=5
  Field 6=8
  Field 7=1
  Field 8=dash

  In this example, the second trigger element of the trigger is a wildcard. Thus, the tracer will be turned on any time an outgoing setup message is followed by any message followed by an incoming setup message.

- Fields within a trigger element can also be wildcards. For example, if field 5=dashed, field 6=8, field 7=1, and field 8=21, then a match would occur on any incoming message containing a call-rejected cause value.

- Some combinations of field settings are invalid, yielding error messages, as explained by the following list:

  — If the message field is not a wildcard, the L2/L3 indicator and message types cannot conflict. For example, a setup ack message type, which is a call control message, can not have an L2/L3 indicator of level 2 primitive, level 3 maintenance, or unknown.

— If the message field is not a wildcard and the L2/L3 primitive field is an L2 primitive, the message direction field must not conflict with the direction of the L2 primitive. For example, if the L2 primitive is an outgoing message, the message direction field must be either outgoing or a wildcard.

— If the message type is not a wildcard and if the L2/L3 indicator is a wildcard, the message type must be a valid call control, maintenance or level 2 primitive message.

— If the message type is not a wildcard, the cause value must not conflict with the message type. For example, a setup message does not have an associated cause value, meaning a cause value entry would cause an error.

— If the message type is a wildcard, the L2/L3 indicator and the cause value must not conflict. For example, if a cause value is entered and the L2/L3 indicator is not set to call control, an error would occur.

To Remove a Trigger

A trigger cannot be removed in build mode — you must go into the selected-trigger mode to remove a trigger.

1. To remove a trigger, enter **cf2** and then enter the number of the trigger you want to remove. An alternative is to use nu in select-trigger mode to advance to the desired trigger.

2. Enter **cdx** to remove the trigger.

Input Fields

You can enter data in the following fields:

• You can select a numbered trigger (trigger element or sequence of trigger elements) in field 2.

• You can use field 3 to assign a trigger number to the sequence of trigger elements you will build in fields 5-12.

• In field 4, you can select 1 of 3 possible segments of the numbered trigger in fields 2 or 3.

• You can select the message type in fields 5 and 9.

• For the message type selected, you can further refine the type of message in fields 6 and 10.

• You can select whether the message is incoming or outgoing in fields 7 and 11.

• You can select cause values for messages in fields 8 and 12.

Field 2 — Select Trigger

Use field 2 to select the trigger you want to view. When you select a valid numbered trigger, displaying fields 5 to 12 show the trigger elements, one two-trigger element segment at a time, that define the trigger.

Field 3 — Build Trigger

Define a trigger by the sequence of trigger elements you enter in fields 5-12. A build trigger number must be entered before entering trigger data. A trigger is a mechnism that can turn the tracer on or off. A trigger can be from 1 to 6 contiguous ISDN/PRI trigger elements. The first set of two trigger elements are defined in segment 1, the second set in segment 2, and the third set in segment 3. Some of the trigger elements can be total wild card trigger elements (all fields of the trigger element dashed). Note that a completely dashed trigger element at the end of a trigger will not be treated as a wild card. For example, if fields 9-12 are all dashed in the last segment of a trigger, that element will not be a wild card — it will simply be ignored. If those fields are all dashed in a segment other than the last segment and some data appears in a succeeding segment, however, that element will be treated as a wild card.

Field 4 — Segment

You can specify up to six trigger elements in a trigger and view the segment of the trigger you selected. A segment number must be specified before building the trigger, but not before viewing it.

l=Messages 1-2
2=Messages 3-4
3=Messages 5-6

Fields 5-8 and 9-12 — Trigger Element

A trigger element is an ISDN PRI message type along with an L2/L3 indicator for the message type, a direction of transmission, and a cause value, which is data contained in some messages. The L2/L3 indicators are used to specify whether the message type is Level 3 Call Control, Level 3 Maintenance, Level 2 Primitive or unknown (8, 3, 2 or 9 respectively). This indicator may also be a wild card. You can also define the message direction (incoming or outgoing). This field can also be a wild card. You can also use cause values to define the trigger. The cause field may also be a wild card.

A total wild card is defined as all four fields of a trigger element (fields 5-8 or 9-12) as dashed and not occurring at the end of the trigger. Individual fields of a trigger element can also be dashed. These will be treated as wild card fields within the trigger element.

Fields 5, 9 — Message

The following table shows the codes for the message types. Note that the level 2 primitives are messages that are not transmitted over the ISDN PRI link. They are messages transported between the ISDN PRI circuit pack and the system's common control software. An outgoing level 2 primitive is transmitted from the common control to the circuit pack and an incoming level 2 primitive is transmitted from the circuit pack to the common control. Also note that the encode is decimal coded hex, ranging from 0000 to 1515, corresponding to the hex values 00 to FF. For example, 214=2E hex, 1205=C5 hex, and 206=26 hex.

Encode	Call Control	Maintenance	Level 2 Primitive
1	Alerting		DL_Establish_Request (outgoing)
2	Call Proc		DL_Release_Request (outgoing)
3	Progress		DL_Data_Request (outgoing)
4			DL_Unit_Data_Request (outgoing)
5	Setup		MDL_Error_Request (outgoing)
6			MDL_Test_Request (outgoing)
7	Connect	Service ack	MDL_Traffic_Request (outgoing)
8			MDL_Check_Request (outgoing)
9			MDL_Sett_Request (outgoing)
10			MDL_Assign_Request (outgoing)
12			MDL_Remove_Request (outgoing)
13	Setup ack		
15	Connect ack	Service	
200	User info		
201	Suspend reject		
202	Resume reject		
205	Suspend		
206	Resume		
213	Suspend acknowledge		
214	Resume acknowledge		
401			DL_Establish_Indication (incoming)
402			DL_Release_Indication (incoming)
405	Disconnect		MDL_Error_Indication (incoming)
406	Restart		
408			MDL_Check_Indication (incoming)
413	Release		
414	Restart acknowledge		
510	Release complete		
600	Segment		
602	Facility		
604	Register		
610	Facility acknowledge		
614	Notify		
702	Facility reject		
705	Status enquiry		
709	Congestion control		
711	Information		
713	Status		
1201			DL_Establish_Confirmation (incoming)
1202			DL_Release_Confirmation (incoming)
1205			MDL_Error_Confirmation (incoming)
1206			MDL_Test_Confirmation (incoming)
1207			MDL_Traffic_Confirmation (incoming)
1208			MDL_Check_Confirmation (incoming)

Fields 6, 10 — L2/L3 Indicator

2=Level 2 primitive
3=Level 3 maintenance
8=Level 3 call control
9=Unknown

Fields 7, 11 — Message Direction

0=Outgoing message
1=Incoming message

Field 8, 12 — Cause

Some ISDN PRI call control messages contain cause information explaining why a call failed or was tom down. Note that the codes are actual decimal codes, corresponding to the codes given in the AT&T ISDN PRI specification. Following are the cause values:

l=Unallocated (unassigned) number
2=No route to specified transit network
6=Channel unacceptable
16=Normal clearing
17=User busy
18=No user responding
21=Call rejected
22=Number changed
28=Invalid number format (Incomplete number)
29=Facility rejected
30=Response to STATUS ENQUIRY
3l=Normal, unspecified
34=No circuit/channel available
38=Network out of order
41=Temporary failure
42=Switching equipment congestion
43=Access information discarded
44=Requested Circuit/channel not available
45=Pre-empted
50=Requested facility not subscribed
52=Outgoing calls barred
54=Incoming calls barred
58=Bearer Capability not presently available
63=Service or option not available, unspecified
65=Bearer service not implemented
66=Channel type not implemented
69=Requested facility not implemented
8l=Invalid call reference value
82=Identified channel does not exist
88=Incompatible destination
96=Mandatory information element missing

97=Message type non-existent or not implemented
98=Message incompatible with call state, non-existent, not implmented
100=Invalid information element contents
102=Recovery on timer expiry
127=Interworking,   unspecified

TEST 7

Use test 7 to specify up to nine strings of dialed digits for incoming call-calling party, incoming call-called party, outgoing call-calling party, or outgoing call-called party, which will activate the trace. For example, an incoming call-called party string means an incoming call to the number represented by the string. These digit strings are used as part of the filters setup in test 4.

To View the Test 7 Screen

To see the test 7 screen, enter **t7** from any point within procedure 949. The test 7 screen, similar to the following, appears.

```
                     ENHANCED MODE-PROCEDURE : 949, TEST : 7
                         DEFINE ISDN DIGIT STRINGS


  2. Digit String: [-]


DIGITS
   3.   Digit 1 :[-]                    12.  Digit 10 :[-]
   4.   Digit 2 :[-]                    13.  Digit 11 :[-]
   5.   Digit 3 :[-]                    14.  Digit 12 :[-]
   6.   Digit 4 :[-]                    15.  Digit 13 :[-]
   7.   Digit 5 :[-]                    16.  Digit 14 :[-]
   8.   Digit 6 :[-]                    17.  Digit 15 :[-]
   9.   Digit 7 :[-]                    18.  Digit 16 :[-]
  10.   Digit 8 :[-]                    19.  Digit 17 :[-]
  11.   Digit 9 :[-]                    20.  Digit 18 :[-]





Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▭
|_____||_____||3 Data ||_____||5 Help ||6 Field ||7 Input ||8 Cmds |
```

To Change the Digit Number

1. Enter **cf** and the number of the input field you wish to change.

2. Enter the data in the field.

3. Enter **cx** to enter the changes you made.

To View the Digits for a String

1. Enter **cf2,** the string number you want to see, and **dx.**

2. Enter **nd** to see the next digit string.

3. After displaying the last string in the list, the next **nd** displays all fields as dashed. The next **nd** then starts with the first defined digit string.

To Remove a Digit String

To remove a digit string, display the string and then enter **cdx.**

Input Fields

You can enter data in the following fields:

- You can assign a number to the digit string infield 2.

- You can select the digits for the string in fields 3-20.

Field 2 — Digit String

You can specify one to nine strings to use for digit analysis as specified in test 4.

Fields 3-20 — Digits

Fields 3 through 20 are the digits, each in the range 0-9, starting with digit 1 in field 3. Dashed fields between digits are not allowed.

SPECIAL ERROR CODES

25=The data capture buffer does not contain data for ISDN MST. (Tests 2, 3)

28=Unless you want a complete wildcard trigger element, you must enter data in all fields of a trigger element from the point at which you start entering to the end of the trigger element, even if you want those fields dashed. (Test 6)

30=Specified run time exceeds limits for the current primary filter. (Test 5)

31=You must enter an ON trigger. (Test 5)

32=You must enter an OFF trigger or COUNT. (Test 5)

33=You must enter an ON trigger and an OFF trigger or an ON trigger and COUNT. (Test 5)

34=This trigger will not be recognized unless you select the correct filter. You created a trigger in Test 6 but you did not turn on the filter to recognize this trigger type. Select the correct filter in fields 2-5 so that the trigger you created will be recognized, select a different trigger, or change your trigger in test 6. (Test 5)

35=The secondary filter you selected is not valid with the primary filter you selected. (Tests 1, 2, 3, 5)

36=Disable the ISDN MST before you setup the filter, buffer control options or gating controls. (Tests 4, 5)

37=An NFAS D Channel has been selected. (Test 4)

39=An incomplete primary filter has been specified. (Test 4)

40=This trigger does not exist-go to test 6 and create it. (Test 5)

40=You entered a trigger that doesn't exist. Select a valid event trigger. Enter **"nu"** to view all defined event triggers. (Test 6)

41=The trigger you are trying to build already exists. If you are rebuilding the trigger, re-enter the build trigger number. If you do not want to rebuild the trigger, enter another build trigger number. Enter "nu" to view all defined triggers. NOTE: See error code 49. (Test 6)

42=You selected an invalid message type for the L2/L3 indicator. (Test 6)

43=Invalid trigger specification. Cannot have level 2 primitive, maintenance message, or unknown specified in Level 2/3 indicator along with a cause value. The specified message type cannot be associated with a cause case. (Test 6)

44=Enter a trigger in field 2 or 3. You entered a trigger segment or you entered **"nd"** before you entered a trigger number in fields 2 or 3. Select a trigger number in field 2 or 3. You may have entered **"cdx"** with no select trigger number entered in field 2. Select a trigger infield 2. (Test 6)

45=You must enter a trigger number in the build trigger field. You are attempting to enter trigger data but you are not in the build trigger mode. (Test 6)

46=The newest message maybe a gap marker or an outgoing unrecognized message. Go to Test 3 to determine the message type. (Tests 2,6)

47=You must build triggers before you enter **"nu".** (Test6)

48=You have entered **"cdx"** in the build trigger mode. This operation is valid only in the select trigger mode. (Test 6)

49=You are trying to add a trigger for which no data or incomplete data has been entered. Enter trigger data in fields 5-12 before the **"cx"** sequence. You must enter the data for all segments of the trigger before entering **"cx".** (Test 6)

50=You cannot enable the ISDN MST because the DCIU MST is enabled. If you want to enable the ISDN MST you must go to Procedure 959 and disable the DCIU message tracer and check to ensure that the buffer is not reserved for DCIU. Note that all DCIU data will be lost when you start the ISDN MST. (Tests 1, 2, 3, 5)

5l=The MST buffer is already reserved for the DCIU message sequence tracer. Go to Procedure 959 to see if the DCIU MST is running. Examine the stop time status to see if the data is current. Check with the system administrator to find out why the buffer is reserved. If the data is no longer required then disable or unreserve the DCIU buffer. (Tests 1, 2, 3, 5)

52=The ISDN MST is already enabled. (Tests 1, 2, 3, 5)

53=Enter **"x x"** to enable the message sequence tracer. (Tests 1, 2, 3, 5)

54=Enter **"x"** again to enable the message sequence tracer. You entered **"x"** once. You must enter **"x"** two times to enable the message sequence tracer. (Tests 1, 2, 3, 5)

55=You must select ISDN MST filters. You tried to run the tracer without first selecting the filters. Go to Tests 4 and 5 and select the filters. (Tests 1, 2, 3, 5)

56=You must select a timer code and a run time. You tried to run the tracer without first selecting the run time. Go to Test 5 and select the run time. (Tests 1, 2, 3,5)

58=The message sequence tracer is already stopped. You entered **"s"** to disable the tracer but the tracer is already stopped. (Tests 1, 2, 3, 5)

59=Enter **"dx"** to go to the start or end of the buffer (based on direction). If the search direction is forward, **"dx"** will return to the start of the buffer. If the search direction is backwards, **"dx"** will return to the end of the buffer. (Tests 2, 3)

80=This digit string specification does not currently exist. Go to Test 7 and build the digit string or view existing digit strings with "nd". (Tests 4,7)

8l=The digit string you selected is invalid. Build a valid digit string containing no dashes. (Test 7)

82=This digit string is already specified. Use "dx" to view the digits associated with the digit string. (Test 7)

84=No digit strings exist at this time. (Test 7)

85=Dashed data is invalid in digit strings. (Test 7)

88=System clock error. ISDN MST will disable itself. (Tests 1, 2, 3, 5)

89=You must select a call control filter in Test 5 if call digit analysis is specified in Test 4. Go to Test 4 and remove the call digit analysis entry or go to Test 5 and add the call control filter. (Tests 1, 2, 3, 4, 5)

90=A partial search was done but no B Channels were found. (Test 4)

91=A complete search was done but no B Channels were found. (Test 4)

93=There are no PRI interfaces in the range you selected. Select a different range. (Test 4)

PROCEDURE 959 - DCIU MESSAGE SEQUENCE TRACER

Procedure 959 is used to capture and display messages transmitted or received over a given DCIU port or over all DCIU ports on Generic 2.2 systems. When enabled, the DCIU message sequence tracer (MST) captures messages, placing them in the data capture buffer. You can then examine the messages stored in the data capture buffer. Some tests in procedure 959 allow you to decide which messages to capture, how many messages to capture, and when and for how long to capture messages. Other tests in this procedure control how you can display the captured messages. Still other tests allow you to monitor the status of the MST. The DCIU MST can be enabled or disabled from tests 1, 2, 3 and 5.

Procedure 959 has eight tests, as follows:

- Use test 1 to observe the status of various DCIU MST parameters set in other tests and to enable or disable the message sequence tracer.

- Use test 2 to display successive messages captured in the DCIU MST data capture buffer without displaying the data for each message and to enable or disable the DCIU MST.

- Use Test 3 to step through the messages in the DCIU data capture buffer, displaying the data for each message, and to enable or disable the DCIU MST.

- Use test 4 to build a filter (or examine an existing filter) for capturing DCIU message data. A filter specifies what kind of data you want to capture in the buffer for messages associated with a given DCIU port or ports.

  You can also enable pegs, which will allow you to examine, on a message type basis, the number of times messages are being sent or received by the given port or ports.

- Use test 5 to setup DCIU MST buffer control options, gating controls, look at the enabled/disabled status of the tracer, and to enable or disable the DCIU MST.

- Use test 6 to build and display triggers that are used in test 5 to turn the tracer on and/or off. In addition to building and displaying triggers, you can specify a byte offset/data-mask to be applied to the trigger. The byte offset/data-mask for a trigger is defined in test 7. Specifying a byte offset/data-mask allows you to trigger the tracer upon detection of certain data within the message.

- Use test 7 to build byte offset/data-masks that will modify triggers.

- Use test 8 to view DCIU MST peg data.

Keystroke Conventions:

The keystrokes used in the MST area mix of maintenance and administration commands. The following list describes the most frequently used commands:

- The keystrokes **cdx, xx,** and **s** are used to enable and disable the MST as follows:

  — The sequence **cdx x x** clears all data in the data capture buffer and enables the tracer.

— The sequence **x x** enables the tracer but does not clear any data from the buffer.

— The keystrokes disables the tracer and puts a gap marker in the data capture buffer.

- All fields by default either contain a dash (-) or some data.

- A highlighted field (a blanked-out field in a different color) means you are being prompted to enter data in that field. If you enter data in that field, the highlight will move to the next field.

- To enter new data in any field, enter **cf** *field number data.*

  — You can enter successive data separated by spaces to enter data into successive fields.

  — For example, if you enter **cf 2 1 2 3 4,** field two will display 1, field 3 will display 2, field 4 will display 3 and field 5 will display 4.

- The data entered is put into a temporary buffer called a scratchpad and is displayed on the screen. Any original values still exist in permanent memory even though they are not displayed.

- Enter **cx** to write the scratchpad values to permanent memory. The values displayed are now the permanent values. The previous values are no longer retrievable because they have been overwritten.

- If, after entering data in one or more fields, you want to restore the original values, you can enter **dx.** This overwrites the scratchpad values with the permanent values and displays them. Any original values are then no longer retrievable.

  Thus, if you have entered data into several fields and you decide you do not want to make those entries, you can type **dx** before you type **cx** to display the original data.

  Another way to restore the original data is to go to another test and back. When you return to the test, the data you entered since the last **cx** (the data in the scratchpad) is overwritten by the previous data (the data in permanent memory).

- In almost all cases to enter a dash (-) in a field, enter **cf** *field number ce;.* When **cx** is subsequently entered, the field will be dashed.

- The keystrokes "next unit" **(nu)** and "next data" **(nd)** are used to advance through data. The uses for these two keystrokes vary depending on the test, but **nd** is usually used to advance through data arrived at through a **nu.** For example, in test 6, pressing **nu** advances you from the current trigger number displayed in field 2 to the next defined trigger number. Pressing **nd** then advances you through each of the two segments for the trigger you arrived at with the **nu.**

  The specific uses of **nu** and **nd** for each test are described under each test.

- In most cases, you can enter data into one or more fields before performing **cx.** In some cases, however, you are required to enter data in several fields before you can perform a **cx.** For example, in test 6, if you enter data in the first field of a trigger element, you must enter data in the second field of the element before you can do a **cx.**

TEST 1

The primary use for test 1 is to display the status of the DCIU MST. Test 1 can also be used to change or monitor the reserved/unreserved status of the DCIU MST data capture buffer and to enable or disable the DCIU MST. The data capture buffer is used for both procedures 949 and 959 but can only be used by one at a time.

To View the Test 1 Screen

To see the test 1 screen, enter **tl** from any point within procedure 959. The test 1 screen, similar to the following, appears:

```
                  ENHANCED MODE-PROCEDURE : 959.,TEST: 1
                DISPLAY DCIU MESSAGE SEQUENCE TRACER BUFFER STATUS

 2.  Monitor Status: ❑
 3.   Enable Status: ❑
 4.   Active Status: ❑
 5.     Wrap Count: ❑
 6.   Percent Full: ❑
 7.  Trigger Status: ❑
 8. Completion Code: ❑


STOP TIME FOR CURRENT TRACE
   9.   Month: ❑
  10 1    Day: ❑
  11.   Hour : ❑
  12. Minute: ❑
  13. Second: ❑


14. DCIU Buffer Status: ❑


Connected to CC0 ON-LINE ♡ ⌈ MAJOR ⌉⌈ MINOR ⌉ ⌈ RUN TAPE ⌉ ⌈ BUSY OUT ⌉ ⌈ IN USE ⌉ ⌈ WAIT ⌉

enter command: ▭
⌈       ⌉⌈       ⌉⌈ 3 Data ⌉⌈      ⌉⌈ 5 Help ⌉⌈ 6 Field ⌉⌈ 7 Input ⌉⌈ 8 Cmds ⌉
```

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

   The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains ISDN data and you start a DCIU trace all ISDN data will be lost.

The tracer continues to gather data until you enter s, until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter s.

If you enter s you will override any preset options and immediately stop the tracer.

Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from where it last stopped, enter **xx.**

To Change the Buffer Status

If you want to reserve the MST data capture buffer so that it can only be used for the DCIU MST, enter **cf14 1.** This will prevent the buffer from being overwritten by ISDN MST data.

If you want to unreserve the MST data capture buffer for DCIU data, enter **cf14 0**

Input Fields

You can change the reserved/unreserved status of the DCIU MST data capture buffer in field 14.

Field 2 — Monitor Status

Shows if the tracer is enabled for ISDN tracing, if the data capture buffer is reserved for ISDN tracing, or whether a single port or all ports are being monitored.

l=ISDN trace enabled
2=Monitoring single port
3=Monitoring all ports
4=ISDN reserved buffer

Field 3 — Enable Status

When the DCIU MST is enabled, it stays enabled until one of the conditions in field 8 is met. During the time the DCIU MST is enabled, field 3 displays a 1. Encode 0 appears when the ISDN MST is disabled.

0=Disabled
l=Enabled

Field 4 — Active Status

The tracer is active only when data is actually being placed in the MST data capture buffer. Thus, field 4 flashes from a 0 to a 1 and back to 0 when data is being put into the buffer. Note that if you are working at 1200 bps, it is possible that data is being entered into the buffer but the 1 never appears (field 6 will continue to be incremented, however).

0=Not active
l=Active

Field 5 — Wrap Count

Shows the number of times that the MST buffer has wrapped around. If the tracer is running in the wrap around mode, a number from 0-99 will appear indicating how many times the MST data capture buffer has been filled. A dash indicates that the count is greater than 99, but there is no limit to the number of times the buffer can wrap around. If wrap-around mode is not enabled, field 5 contains a 0.

Field 6 — Percent Full

Shows what percentage of the MST buffer is full for the current active trace. Note that upon receipt of the first message, the percent is bumped from 0 to 1 percent to show that the buffer is beginning to fill. From this point on, the number represents the actual percent-full measurement.

Field 7 — Trigger Status

Shows what the current trigger status is.

0=No trigger or count specified
l=Looking for on trigger to fire
2=Looking for off trigger to fire
3=Implementing the count function
4=Count function and looking for on trigger
5=On trigger occurred
6=Off trigger occurred

Field 8 — Completion Code

Shows why the trace stopped. You may have entered "s", the timer may have expired, the MST data capture buffer may have filled up with the non-wrap option set, an off-trigger might have fired with the retrigger option not set, or the specified count (from test 5) might have been reached.

l=You entered stop
2=Timer expired
3=Buffer is full
4=Off trigger hit or count expired

Fields 9-13 — Stop Time For Current Trace

Shows the anticipated stop time if the trace is enabled or the actual stop time. Shows when the tracer will be disabled (you can select a run time in test 5). If the tracer becomes disabled, fields 9-13 show the actual stop time. If you manually enable the tracer, a new time will be computed based on the run time you entered in Test 5. Time measurements are based on the system clock setting.

Field 9 is the month (1-12)
Field 10 is the day (1-31)
Field 11 is the hour (-, 0-23)
Field 12 is the minute (-, 0-59)
Field 13 is the second (-, 0-59)

Field 14 — DCIU Buffer Status

Reserves the data capture buffer for DCIU MST use only. This prevents an overwrite of the data in the DCIU trace buffer by the ISDN tracer because the ISDN tracer cannot be enabled if the DCIU buffer is reserved.

0=Not reserved
 1=Reserved

TEST 2

Use test 2 to display successive messages captured in the DCIU MST data capture buffer without displaying the data for each message and to enable or disable the DCIU MST.

To View the Test 2 Screen

To see the test 2 screen, enter **t2** from any point within procedure 959. The test 2 screen, similar to the following, appears:

```
┌──────────────────────────────────────────────────────────────────────┐
│                ENHANCED MODE-PROCEDURE : 959, TEST : 2                 │
│                      EXAMINE DCIU EVENT CODES                          │
│                                                                        │
│ 2.  Scroll Direction:  [-]             3.  Scroll Steps : [-]          │
│DCIU EVENT                                                              │
│   4.        Event Code: [--]                                           │
│   5.              Port: [--]                                           │
│   6. Message Direction: [-]                                            │
│DCIU EVENT                                                              │
│   7.        Event Code: [--]                                           │
│   8.              Port: [--]                                           │
│   9. Message Direction: [-]                                            │
│DCIU EVENT                                                              │
│  10.        Event Code: [--]                                           │
│  11.              Port: [--]                                           │
│  12. Message Direction: [-]                                            │
│DCIU EVENT                                                              │
│  13.        Event Code: [--]                                           │
│  14.             Port : [--]                                           │
│  15. Message Direction: [-]                                            │
│                                                                        │
│Connected to CC0 ON-LINE ♡ [MAJOR] [MINOR] [RUN TAPE] [BUSY OUT] [IN USE] [WAIT]│
│                                                                        │
│enter command: _                                                        │
│ [      ] [      ] [3 Data] [      ] [5 Help] [6 Field] [7 Input] [8 Cmds]│
└──────────────────────────────────────────────────────────────────────┘
```

To Select Scroll Direction and Steps

1. Enter **cf2** and enter **1** if you want to scroll forward or enter **2** if you want to scroll backward.

   Scrolling forward means messages, in the order from oldest to newest, enter the display from the bottom (fields 13-15) and fill upward. Scrolling backward means messages, in the order from newest to oldest, enter the display from the top (fields 4-6) and fill downward.

2. Enter **cf3** and enter the number of steps you want to scroll by. You can scroll by either 1 or 4 messages. Scrolling by four is the same as scrolling by one four times.

To Examine DCIU Messages

The **nu** operation scrolls through the messages captured in the data capture buffer. Note that if the buffer has wrapped around, the oldest messages are overwritten when the buffer fills.   Also, if the wrap option is not set and the buffer fills up, the MST is disabled. In both cases, if you are scrolling as new messages are being captured, each time you reach the newest message in the buffer, that message will be different from the newest message you viewed the time before.

The following example shows how scrolling works in the most common case — the buffer is static (no more messages are being captured), and is not full:

Assume five messages, labeled message 1, message 2... message 5, have been captured. Also assume that message 1 is the oldest message, message 2 the next oldest and so on.

- When scrolling forward by 1, the following will be displayed:

  — Assume the initial display shows message 1 in fields 13-15 with fields 4-12 dashed. This is a typical initial display immediately after the trace has been run.

  — After the first **nu,** message 2 will be displayed in fields 13-15 and message 1 will be displayed in fields 10-12.

  — Each **nu** brings the newest message into fields 13-15 and moves the others up.

  — After the fourth **nu,** message 5 is displayed in fields 13-15, message 4 in fields 10-12, message 3 in fields 7-9, and message 2 in fields 4-6. The next **nu** then dashes fields 13-15, moving the messages up as before.

  — Two more **nu** operations yields message 5 in fields 4-6 and the rest dashed.

  — The next **nu** then displays message 1 again in fields 13-15 with fields 4-12 dashed.

- When scrolling forward by four, the following will be displayed:

  — Again, assume the initial display shows message 1 in fields 13-15 with fields 4-12 dashed. This is a typical initial display immediately after the trace has been run.

  — Pressing **nu** then displays message 2 through message 5 in fields 4-15 respectively.

  — Pressing **nu** again returns to the initial display.

- Scrolling backward by one yields the following displays:

  — Assume the initial display shows message 5 in fields 4-6 with fields 7-15 dashed. This is a typical initial display immediately after the trace has been run.

  — Each successive **nu** operation pushes message 5 down, bringing in message 4, message 3, etc. from the top.

  — After four **nu** operations, message 1 is in fields 4-6, message 2 is in fields 7-9,..., and message 4 is in fields 13-15.

  — The next **nu** pushes the messages down, dashing fields 4-6.

  — Two more **nu** operations yields message 1 in fields 13-15 and fields 4-12 dashed.

  — The next **nu** then yields message 5 in fields 4-6 with the rest dashed.

- Scrolling backward by 4 yields the following displays:

— Assume that initially message 5 is displayed in fields 4-6 with the rest dashed.

— Pressing **nu** will yield message 1 through message 4 in fields 4-15 respectively.

— The next **nu** operation will again yield the initial display.

From any point within the scroll, you can jump back to the beginning of the scroll, by entering **dx** twice.

You can carry a single message from this test to test 3. If you are scrolling forward and you enter t3 to go to test 3, the message appearing in fields 13-15 will be displayed when you enter test 3. If you are scrolling backward, the message appearing in fields 4-6 will be displayed when you enter test 3.

Likewise, the message displayed in test 3 will be displayed upon entering test 2. If the scroll direction is forward, the message will be displayed in fields 13-15. If the scroll direction is backward, the message will be displayed in fields 4-6. Note that the scroll direction and search direction in tests 2 and 3 are always the same — if you change one, the other automatically changes to match it.

Note that if you change the search direction in test 3, you might get the initial display (first or last message in the buffer with the other nine fields dashed) upon returning to test 2. This happens if you change search directions and cross the beginning or end-of-buffer boundary.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

    The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

    If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains ISDN data and you start a DCIU trace all ISDN data will be lost.

    The tracer continues to gather data until you enters, until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter s.

    If you enter s you will override any preset options and immediately stop the tracer.

    Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from where it last stopped, enter **x x** again.

Input Fields

- You can select the scroll direction (forwards or backwards) in field 2.

- You can select the number of messages to scroll by in field 3.

Field 2 — Scroll Direction

Shows the direction you are scrolling (forward or backward). The default direction is forward (the oldest message enters in fields 13-15 and is bumped upward with each successive scroll when scrolling by 1).

1=Scroll forward
2=Scroll backward

Field 3 — Scroll Steps

Shows the message type increments (one or four) that you use to step through the data. You can scroll by one message at a time or by four messages at a time. When scrolling by four messages at a time, the screen displays the data as if you scrolled by one four times. For example, if scrolling forward by one and you do this four times, four messages will be displayed, with the first one displayed in fields 4-6. The default scrolling step is one.

1=Scroll by 1
4=Scroll by 4

Fields 4, 7, 10, 13 — DCIU Event

10=Outgoing application message
1l=Incoming application message
12=Application error-no buffer
13=Application error-port not available
14=Application error-message too long
15=Application error-DTM port
16=DTM port application error-file transfer in progress
17=DTM port application error-port not available
18=DTM port application error-file too long
19=DTM port application error-not a DTM port
20=Outgoing session connect
21=Outgoing session accept
22=Outgoing session reject
23=Outgoing session disconnect
24=Outgoing session resynchronization acknowledge
25=Incoming session connect
26=Incoming session accept
27=Incoming session reject
28=Incoming session disconnect
29=Incoming session resynchronization
30=Confirmation message
40=Reset logical channel
41=Resend messages
42=Send resynchronization message
43=Turn port on
44=Turn port off
45=Session layer ack reset of logical channel
46=DCIU ack reset of logical channel

47=DCIU ack resend of messages
48=DCIU ack resending of resynchronization
49=DCIU ack turning port off
50=DCIU requests reset of logical channel
60=Timer expired-session connect
61=Timer expired-session retransmission
62=Timer expired-resynchronization
63=Timer expired-abort session 1
64=Tmer expired-abort session 2
70=Outgoing messages lost
71=Dip icom record aborted
72=Unrecognizable alternate routing field
73=Unrecognizable session layer header
74=Unrecognizable opcode
95=Gap marker

Fields 5, 8, 11, 14 — Port

The DCIU port number in the range 1 to 64.

Fields 6, 9, 12, 15 — Message Direction

0=Out
l=In

TEST 3

Use test 3 to step through the messages, as in test 2, but also to further examine the data captured for these messages. You can also enable and disable the DCIU MST from this test.

To View the Test 3 Screen

To see the test 3 screen, enter **t3** from any point within procedure 959. The test 3 screen, similar to the following, appears.

```
                   ENHANCED MODE-PROCEDURE : 959, TEST: 3
                            INSPECT DCIU MESSAGES


  2. Search Direction: -


DCIU EVENT
     3. Message Direction: -
     4.         Event Code: --
     5.              Port: --


EVENT TIME , SPECIAL DATA, OR LINK DATA
     6.         Hour I special  Data I Link  Data: ----
     7.       Minute I Spatial  Data I Link  Data: ----
     8.       Second I Special  Data I Link  Data: ----
     9. Centisecond I Special  Data I Link  Data: ----
    10.          Day I Special  Data I Link  Data: --




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |


enter command: ▭
|          ||       || 3 Data ||       || 5 Help || 6 Field || 7 Input || 8 Cmds |
```

To Select Search Direction

Enter **cf2** and enter **1** if you want to search forward or enter **2** if you want to search backward.

Searching forward means you start at the first message in the buffer (the oldest) and proceed to the last message in the buffer. Searching backward means you start at the last message in the buffer (the newest) and proceed to the first message in the buffer.

When searching forward, the oldest message (the first one to enter the buffer) is the first message displayed, followed by the next oldest message and so on. When searching backward, the newest message in the buffer (the last message to enter the buffer) is displayed, followed by the next newest message and so on.

Note that you can search through messages as data is being entered into the buffer, meaning that when searching backward, the newest message is the newest message at that point in time.

To Examine DCIU Messages

1. Fields 3-10 display data for a message in the data capture buffer. Note that field 10 tells you which of the three kinds of data is in fields 6-10, as follows:

   — If field 10 contains a number from 1 to 31, the data is a time stamp and field 10 represents the day.

   — If field 10 contains a dash, the data in fields 6-9 is link data (data that is actually transported over the link).

   — If field 10 contains a 99, fields 6-9 contain special data (internal switch data that is not transported over the link).

2. If you carried a message over from test 2, data for that message will be displayed in fields 3-10 when you enter test 3. Otherwise, all fields will be dashed.

3. Enter **nu** to step through the messages captured in the DCIU MST data capture buffer.

   — If the search direction is forward and no message is carried over, the first message displayed is the oldest message in the buffer, then the next oldest and so on.

   — If the search direction is backward and no message is carried over, the first message displayed is the newest message in the buffer, then the next newest and so on.

   After you view all DCIU events, the switch dashes all DCIU event and data fields. If you enter **nu** again, the first DCIU message appears in fields 3-5 with the time stamp data in fields 6-10. If time stamps are not enabled, fields 6-10 are dashed.

4. For a given message specified by fields 3-5, enter **nd** to step through the three types of data in fields 6-10. For example, if the time stamp data is displayed, entering **nd** will display special data for that message — another **nd** will then display link data for that message. After you step through all the link data associated with the current event code, the switch will dash the data fields. If you enter **nd** again, the time stamp will again appear (if applicable).

   If you are viewing an abbreviated DCIU message set, the data that will be displayed is the same as for the full message set with the following exceptions: Only the message headers are displayed in the case of incoming/outgoing application layer messages, incoming/outgoing session layer messages, BX.25 error messages (outgoing message lost), or unrecognized BX.25 messages.

5. If you want to go back to the beginning of the trace to view data again without having to step through the entire trace, enter **dx** twice.

   Note that the beginning is defined by the search direction in field 2.

6. If you enter test 2, the message currently displayed in test 3 will be displayed upon entering test 2. If the scroll direction is forward, the message will be displayed in fields 13-15 of test 2. If the scroll direction is backward, the message will be displayed in fields 4-6. Note that the scroll direction and search direction in tests 2 and 3 are always the same — if you change one, the other automatically changes to match it.

7. Likewise, the message currently displayed in test 2 will be displayed in test 3 when you enter test 3. If the scroll direction is backward, the message in fields 4-6 of test 2 will be displayed in test 3. If the scroll direction is forward, the message in fields 13-15 of test 2 will be displayed in test 3.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

    The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

    If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains ISDN data and you start a DCIU trace all ISDN data will be lost.

    The tracer continues to gather data until you enter s, until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter s.

    If you enter s you will override any preset options and immediately stop the tracer.

    Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from where it last stopped, enter **x x** again.

Input Fields:

You can select the search direction (forwards or backwards) in field 2.

Field 2 — Search Direction

Controls the search direction. The default is forward (oldest data first).

l=Search Forward
2=Search Backward

Field 3 — Message Direction

Shows whether you are displaying an outgoing message or an incoming message.

0=Out
l=In

Field 4 — Event Code

Shows the code for the DCIU message.

10=Outgoing application message
11=Incoming application message

12=Application error-no buffer
13=Application error-port not available
14=Application error-message too long
15=Application error-DTM port
16=DTM port application error-file transfer in progress
17=DTM port application error-port not available
18=DTM port application error-file too long
19=DTM port application error-not a DTM port
20=Outgoing session connect
21=Outgoing session accept
22=Outgoing session reject
23=Outgoing session disconnect
24=Outgoing session resynchronization acknowledge
25=Incoming session connect
26=Incoming session accept
27=Incoming session reject
28=Incoming session disconnect
29=Incoming session resynchronization
30=Confirmation message
40=Reset logical channel
41=Resend messages
42=Send resynchronization message
43=Turn port on
44=Turn port off
45=Session layer ack reset of logical channel
46=DCIU ack reset of logical channel
47=DCIU ack resend of messages
48=DCIU ack resending of resynchronization
49=DCIU ack turning port off
50=DCIU requests reset of logical channel
60=Timer expired-session connect
6l=Timer expired-session retransmission
62=Timer expired-resynchronization
63=Timer expired-abort session 1
64=Timer expired-abort session 2
70=Outgoing messages lost
7l=Dip icom record aborted
72=Unrecognizable alternate routing field
73=Unrecognizable session layer header
74=Unrecognizable opcode
95=Gap marker

Field 5 — Port

Shows the DCIU port (in the range 1 to 64) sending or receiving the message.

Fields 6-10 — Event Time, Special Data, Or Link Data

Fields 6-10 provide three types of data for the message displayed in fields 3-5. The type of data displayed, time stamp, special data, or link data, is determined by the contents of field 10, as follows:

- If field 10 contains a number from 1 to 31, the data is a time stamp and field 10 represents the day.

- If field 10 contains a dash, the data in fields 6-9 is link data (data that is actually transported over the link).

- If field 10 contains a 99, fields 6-9 contain special data (internal switch data that is not transported over the link).

- If all fields contain dashes after an **nd** operation, the end of the list for that type of data has been reached.

TEST 4

Use Test 4 to build a filter (or examine an existing filter) for capturing DCIU message data. A filter specifies what kind of data you want to capture in the buffer for messages associated with a given DCIU port or ports. For example, for DCIU port 5, you might want to capture only application messages, filtering out all other types of messages associated with that port.

You can also enable pegs, which will allow you to examine, on a message type basis, the number of times messages are being sent or received by the given port or ports.

To View the Test 4 Screen

To see the test 4 screen, enter **t4** from any location in procedure 959. The test 4 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────────┐
│                                                                        │
│            ENHANCED MODE-PROCEDURE: 959, TEST : 4                      │
│                         SETUP DCIU FILTER                              │
│                                                                        │
│   2.              Port  Number: [--]                                   │
│   3.           Session  Message: [-]                                   │
│   4.      DCIU Control  Message: [-]                                   │
│   5.       Application  Message: [-]                                   │
│   6.        Application  Error: [-]                                    │
│   7.           Confirm  Message: [-]                                   │
│   8.  Timer Expiration  Message: [-]                                   │
│   9.       BX.25  Error  Message: [-]                                  │
│  10.     BX.25 Unknown  Message: [-]                                   │
│  11.              Peg  Enable: [-]                                     │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│  Connected to CC0 ON-LINE ♡ │MAJOR││MINOR││RUN TAPE││BUSY OUT││IN USE││WAIT│
│ ───────────────────────────────────────────────────────────────────── │
│  enter command: ▭                                                      │
│  │_____││_____││3 Data││_____││5 Help││6 Field││7 Input││8 Cmds│    │
└──────────────────────────────────────────────────────────────────────┘
```

You can use the filters to:

1. Capture any combination of eight types of messages for a given port or for all translated ports. The eight message types are those specified infields 3-10.

2. Enable or disable pegs on the designated port or ports. A peg is a single occurrence of a message type on the given port or ports. The pegs are monitored for display in test 8 if enabled here.

Note that you must disable the tracer (in tests 1 ,2, 3, or 5) while selecting a filtering group. You cannot enter data while the tracer is enabled (the **cx** function will not work if you try to implement the data entry). Enter s from tests 1, 2, 3, or 5, to disable the tracer.

To Build a Filter

Only one filter can exist at any one time. Thus, when you enter test 4, the previous filter is displayed. If no filter exists, all fields are dashed. To build a new filter, you must select the port number you are going to run the trace on. You can decide to run the trace on all translated ports if you want. After you have specified the port (or all translated ports) you want the trace to run on, you specify which messages on that port you want to capture by the encodes you enter into fields 3-10. You can then decide to enable or disable pegs on that port. You examine these pegs in test 8.

1. In field 2, enter the DCIU port number you want to run the trace on or type **nu** to advance to the desired DCIU port. (Typing **nu** steps you through each translated DCIU port.)

   If you want to run the trace on all DCIU ports, enter a dash (–) in field 2.

2. In fields 3-10 enter the encodes for the types of messages you want to capture on the port or ports specified in field 2. Note that fields 6-10 specify only two options — either do not capture the message or capture the message.

3. Enable or disable pegs in field 11. If you enable pegs, test 8 will display peg data for all messages on the specified port or ports, regardless of how fields 3-10 are set.

Input Fields

— You can select the DCIU port number in field 2.

— You can select whether you want to capture session messages and the message direction in field 3.

— You can select whether you want to capture DCIU control messages and the message direction in field 4.

— You can select whether you want to capture application messages and the message direction in field 5.

— You can select whether you want to capture application error messages in field 6.

— You can select whether you want to capture confirmation messages in field 7.

— You can select whether you want to capture timer expiration messages in field 8.

— You can select whether you want to capture BX.25 error messages in field 9.

— You can select whether you want to capture unknown BX.25 messages in field 10.

— You can enable capturing of peg counts in field 11.

Field 2 — Port Number

Shows the DCIU port number in the range 1 to 64.

dash=All translated DCIU ports

Field 3 — Session Message

0=No session message
1=Session message incoming
2=Session message outgoing
3=Session message incoming or outgoing

Field 4 — DCIU Control Message

0=No DCIU control message
l=DCIU control message incoming
2=DCIU control message outgoing
3=DCIU control message incoming or outgoing

Field 5 — Application Message

0=No Application message
l=Application message in
2=Application message out
3=Application message in or out

Field 6 — Application Error

0=Off
l=On

Field 7 — Confirm Message

0=Off
l=On

Field 8 — Timer Expiration Message

0=Off
l=On

Field 9 — BX.25 Error Message

0=Off
l=On

Field 10 — BX.25 Unknown Message

0=Off
l=On

Field 11 — Peg Enable

0=Off
l=On

TEST 5

Use Test 5 to set up DCIU MST buffer control options, gating controls, look at the enable/disabled status of the tracer, and to enable or disable the DCIU MST

The buffer options set in fields 2-6 set several parameters involved with how the buffer stores the captured data and makes it available for display. For example, if you want to see only a part of each captured message, field 2 can be set to capture only an abbreviated portion of each message.

The gating options set in fields 7-10 determine when and for how long data will be captured based on the triggers that have been built and on the number of messages you want to capture. For example, you can begin capturing messages based on the detection of a certain message or sequence of messages (ON trigger) and quit capturing messages starting with a given number of messages after a certain message or sequence of messages is detected (OFF trigger plus count).

To View the Test 5 Screen

To see the test 5 screen, enter **t5** from any location in procedure 959. The test 5 screen, similar to the following, appears.

```
┌────────────────────────────────────────────────────────────────────┐
│                                                                      │
│┌────────────────────────────────────────────────────────────────────┐│
││               ENHANCED MODE-PROCEDURE : 959, TEST : 5              ││
││                  DCIU BUFFER OPTIONS AND GATING                    ││
││                                                                    ││
││ BUFFER OPTIONS                                                     ││
││    2. Message Set: [-]                                             ││
││    3.  Time Stamp: [-]                                             ││
││    4. Wrap Enable: [-]                                             ││
││    5.  Timer Code: [-]                                             ││
││    6.   Run Time: [--]                                             ││
││                                                                    ││
││ GATING OPTIONS                                                     ││
││    7.     ON Trigger: [-]                                          ││
││    8.    OFF  Trigger: [-]                                         ││
││    9.        Count : [---]                                         ││
││   10. Retrigger Status: [-]                                        ││
││                                                                    ││
││ 11. Enable Status: [-]                                             ││
││                                                                    ││
││                                                                    ││
││                                                                    ││
││ Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]││
││                                                                    ││
││ enter command: _                                                  ││
││ [      ][      ][3 Data ][      ][5 Help ][6 Field][7 Input][8 Cmds]││
│└────────────────────────────────────────────────────────────────────┘│
└────────────────────────────────────────────────────────────────────┘
```

To Set Up DCIU MST Buffer Control Options and Gating Controls

1. Enter **cf** and the number of the input field you want to change. Note that the MST must be disabled otherwise you will be blocked when you try to perform a **cx.**

2. Select an encode for the field you want to change.

3. Enter **cx** to change the fields.

4. To back out of the change, enter **dx** any time before you enter **cx** The current settings appear.

   The status indicator will show enabled/disabled status of the DCIU MST.

To Enable or Disable the Message Sequence Tracer

1. If you want to clear all old data in the MST data capture buffer and then start the trace, enter **cdx x x.**

   The trace will start at the beginning of the MST data capture buffer and all previous data will be lost.

2. If you want to continue collecting data, enter **x x** to enable the tracer.

   If you did not clear all old data, new data will be added to the existing trace data in the MST data capture buffer. Note that if the trace buffer contains ISDN data and you start a DCIU trace all ISDN data will be lost.

   The tracer continues to gather data until you enter s, until the trace timer expires, until there is an off-trigger and no retrigger, until the specified count (from test 5) has been reached, or until the tracer buffer fills up with the wrap option off.

3. If you want to stop the tracer, enter s.

   If you enter s you will override any preset options and immediately stop the tracer.

   Every time the tracer is disabled, for any reason, the end of the data just captured is marked with a gap marker. Note that the presence of a gap marker in the data capture buffer means that the tracer was interrupted for a period of time, during which no data was captured.

4. If you want to enable the tracer from where it last stopped, enter **x x** again.

Input Fields

- You can specify an abbreviated message set or a full message set in field 2.

- You can enable or disable time stamps in fields 3.

- You can decide whether the buffer can or cannot wrap around in field 4

- You can specify the units of measure for the run time of the tracer in field 5.

- You can specify a run time in field 6.

- You can specify gating options in fields 7-10

Field 2 — Message Set

The abbreviated message set is the default. If the tracer is enabled, data through the selected filter will be captured under control of this option. Full message sets are only applicable to application layer, session layer, and type BX.25 messages. If a full message set is selected, all data will be captured.

1=Abbreviated message set
2=Full message set

Field 3 — Time Stamp

Time stamps are a very useful trouble tracking tool, however, there may be cases where they are not needed and the buffer space could be better utilized if the time stamps were turned off. If time stamps are enabled, they appear in fields 6-10 of test 3 when you are viewing the captured messages.

0=Disable Time Stamps
1=Enable Time Stamps

Field 4 — Wrap Enable

The tracer will either run until the buffer is full (if all other parameters allow it) or run continuously (if all other parameters allow it). If you select wrap around, the oldest data will be overwritten.

l=Do not exceed buffer size
2=Wrap around (the oldest data is lost)

Field 5 — Timer Code

Shows the units of measure for the run time of the tracer. For example, if you enter 2 in field 5, and you enter 10 in field 6, the trace will stop after 10 minutes from the time it was enabled.

l=Seconds
2=Minutes
3=Hours
4=Days

Field 6 — Run Time

You must select a run time to control the maximum amount of time the tracer can run.

l-99=Number of units as specified in field 5

Fields 7-10 — Gating Options

You can use the gating options in these fields in conjunction with the triggers you built in test 6 to take a controlled "snapshot" of the trace. Following are some examples of different ways to do this:

• You can start capturing messages starting with the last message of an ON trigger, and continue capturing messages through the tenth message after the last message of an OFF trigger (assuming the run time has not been exceeded), and run the trace again on each successive occurrence of the ON trigger. In this example, field 7 is the number of a trigger defined in test 6, field 8 is also some trigger number from test 6, field 9 is 10 and field 10 is 1. If an ON trigger is specified, the last message of the ON trigger is always the first message captured.

• You can begin capturing messages starting with the last message of an ON trigger and capture eight additional messages. In this example, field 7 is **1,** field 8 is dashed, field 9 is **8,** and field 10 is **0.**

Note that the retrigger option is meaningful only if the tracer is turned on by an ON trigger (field 7=a defined trigger number) and an OFF trigger (field 8=a defined trigger number) or a COUNT (field 9=a number from 1 to 999).

Field 7 — ON Trigger

dash=No trigger specified
l-9=Trigger specified. This is the number of a trigger you built in test 6. For example, if you want trigger number 4 to be the ON trigger for this trace, enter 4 in field 7.

Note that if an ON trigger is specified, the MST will capture only the last message of the ON trigger, which can be a sequence of up to six messages.

Field 8 — OFF Trigger

dash=No trigger specified
l-9=Trigger specified. This is the number of a trigger you built in test 6. For example, if you want trigger number 5 to be the OFF trigger for this trace, enter 5 in field 8.

Note that if an OFF trigger is specified without a count, all messages of the OFF trigger will be captured.

Field 9 — Count

dash=No count specified
l-999=Count

If an OFF trigger is specified, the count always means to capture messages until count number of messages after the last message of the OFF trigger is detected.

If an ON trigger is specified without an OFF trigger, count means to capture the last message of the ON trigger plus COUNT number of additional messages.

If neither an ON trigger nor an OFF trigger are specified, count means to capture count number of messages.

Field 10 — Retrigger Status

If the retrigger option is set, the tracer will automatically be re-enabled if the conditions are valid. The valid conditions are:

- ON trigger and OFF trigger specified

- ON trigger and COUNT specified

- ON trigger, OFF trigger and COUNT specified

0=Do not retrigger
l=Retrigger

Fields 7 through 10 Summary

The following table summarizes how the tracer acts based on all the possible combinations of fields 7-10 settings:

Gating Control Specification-l-data 0=no data specified				
Field 7	**Field 8**	**Field 9**	**Field 10**	**Tracer Operation**
0	0	0	0	Manual Operation
0	0	0	l	Invalid without ON and (OFF or COUNT)
0	0	1	0	Manual ON-Off on COUNT
0	0	1	1	Invalid without ON
0	1	0	0	Manual ON/Auto OFF
0	1	0	l	Invalid without ON
0	1	1	0	Manual ON/ Auto OFF on COUNT
0	1	1	1	Invalid without ON
l	0	0	0	Auto ON/ Manual OFF
l	0	0	1	Invalid without OFF or COUNT
l	0	1	0	Auto ON-Off on COUNT
l	0	1	1	Auto ON (RESTART)/-Off on COUNT
l	1	0	0	Auto ON/Auto OFF
l	1	0	1	Auto ON (RESTART)/Auto OFF
l	1	1	0	Auto ON/Auto OFF on COUNT
l	1	1	1	Auto ON (RESTART)/Auto OFF on COUNT

Field 11 — Enable Status

0=Tracer disabled
l=Tracer enabled

TEST 6

Use Test 6 to do the following:

- You can build triggers that are used in test 5 to turn the tracer on and/or off.

  — A trigger is a sequence of one to six trigger elements defined in fields 6-13.

  — Each pair of fields (fields 6 and 7,8 and 9, and so on) define one trigger element of the trigger. The first four trigger elements can thus be displayed in fields 6-13. This is called segment 1. The fifth and sixth trigger elements, if defined, are defined by fields 6-9 in segment 2. Thus, trigger elements 1, 2, 5, and 6 all use fields 6-9, but trigger elements 1 and 2 occur in segment 1 while trigger elements 5 and 6 occur in segment 2.

  — When this sequence of trigger elements is detected, the tracer either begins capturing messages or quits capturing messages depending on how fields 7, 8, and 9 in test 5 are set.

- The triggers to be used in the trace are specified in fields 7 and 8 of test 5.

- In addition to building and displaying triggers, you can specify a byte offset/data-mask to be applied to the trigger. The byte offset/data-mask for a trigger is defined in test 7. Specifying a byte offset/data-mask allows you to trigger the tracer upon detection of certain data within the message. If a byte offset/data-mask is not specified, the detection of the message will trigger the tracer. For example, with the proper byte offset/data-mask set, you can trigger the tracer upon detection of the distinctive ringing message from a given extension or range of extensions. Without the byte offset/data-mask set, however, the tracer would be triggered upon detection of any outgoing application message from any extension.

To View the Test 6 Screen

To see the test 6 screen, enter **t6** from any point within procedure 959. The test 6 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────────┐
│┌──────────────────────────────────────────────────────────────────────┐│
││               ENHANCED MODE-PROCEDURE: 959, TEST: 6                    ││
││                          DCIU  TRIGGERS                                ││
││                                                                        ││
││  2.  Select Event: [-]                                                 ││
││  3.   Build Event: [-]                                                 ││
││  4.          Mask: [-]                                                 ││
││  5.       Segment: [-]                                                 ││
││                                                                        ││
││  DCIU  EVENT  TRIGGER                                                  ││
││     6.  Event Code: [--]                                              ││
││     7.        Port: [--]                                              ││
││  DCIU  EVENT  TRIGGER                                                  ││
││     8.  Event Code: [--]                                              ││
││     9.        Port: [--]                                              ││
││  DCIU  EVENT  TRIGGER                                                  ││
││    10.  Event Code: [--]                                              ││
││    11.        Port: [--]                                              ││
││  DCIU  EVENT  TRIGGER                                                  ││
││    12.  Event Code: [--]                                              ││
││    13.        Port: [--]                                              ││
││                                                                        ││
│└──────────────────────────────────────────────────────────────────────┘│
│ Connected to CC0 ON-LINE ♡ │MAJOR│ │MINOR│ │RUN TAPE│ │BUSY OUT│ │IN USE│ │WAIT││
│                                                                        │
│─────────────────────────────────────────────────────────────────────  │
│ enter command: ▭                                                       │
│ ┌────────┐ ┌────────┐ │3 Data │ ┌────┐ │5 Help │ │6 Field │ │7 Input │ │8 Cmds ││
└──────────────────────────────────────────────────────────────────────┘
```

To Display Triggers

1. Enter **cf2** and then enter trigger number from one to nine.

2. Enter **dx** to see the first segment of the trigger.

3. Enter **nu** to step through each trigger in the current list of triggers. Each time you press **nu,** the first segment of the next trigger is displayed.

    When the last trigger is displayed, the next **nu** shows all fields dashed. The next **nu** then displays the first trigger again.

4. Enter **nd** to view data segments for the trigger number displayed in field 2. Trigger elements 1 through 4 occur in segment 1 while trigger elements 5 and 6 occur in segment 2. You can also decide which segment of the trigger you want to display by entering **cf5** and either 1 or 2 for the segment number you want displayed.

To Build or Modify a Trigger

To build or modify a trigger, do the following:

1. Enter **cf 3** and then enter a trigger number from one to nine.

2. If you want the byte offset/data-mask you built for this trigger in test 7 to be applied to this trigger, enter **1** in field 4. If you specify a byte offset/data-mask here, you must have already built it in test 7. If, however, you have built a byte offset/data-mask in test 7, it is not required that you specify one here.

3. If you are building or modifying any of the first four trigger elements of the trigger, enter **1** in field 5. If you are building or modifying trigger elements 5 or 6 of the trigger, enter 2 in field 5.

4. In fields 6 through 13 of segment 1 or fields 6 through 9 of segment 2, enter each trigger element of the trigger and the DCIU port on which you want to look for that trigger element. Note that, unless you want a complete wildcard trigger element, you must enter data in all fields of a trigger element from the point at which you start entering to the end of the trigger element, even if you want those fields dashed. This rule applies whether you are building a new trigger or modifying an existing trigger. For example, if you are modifying a trigger and the only difference is the entry in field 6, you must reenter the data in field 7 also, even if field 7 is dashed.

    The only exception to this rule is if a trigger element is all dashed, meaning that trigger element is a total wildcard (fields 6 and 7 are dashed, for example). In this case you do not have to enter any data in those fields.

5. After you enter all the data to build the trigger, enter **cx** to place the data on your screen into permanent memory.

6. Enter **nd** to display the two segments for the displayed trigger number.

Following are rules for wildcards in triggers:

● If both fields of a trigger element in a trigger are dashed, that trigger element is a total wildcard. For example, assume a trigger consists of the following:

    Field 6=10
    Field 7=0
    Fields 8, 9=dashed
    Field 9=11
    Field 10=1

    In this example, the second trigger element of the trigger is a wildcard. Thus, the tracer will be turned on any time an outgoing application message is followed by any message followed by an incoming application message.

● The port can be a wildcard field if the message is specified but the message cannot be a wildcard if the port is specified. For example, if field 6=10 and field 7=dashed, then a match will occur when an outgoing application message is detected on any port. If field 6=dashed and field 7=1, an error message would be displayed.

To Remove a Trigger

A trigger cannot be removed in build mode — you must go into the select trigger mode to remove a trigger.

1. To remove a trigger, enter **cf 2** and then enter the number of the trigger you want to remove. An alternative is to use **nu** in select-trigger mode to advance to the desired trigger.

2. Enter **cdx** to remove the trigger.

Input Fields

— In field 2 you can select a trigger number that has already been built.

— You can enter a trigger number in field 3 to build or modify another trigger.

— In field 4, you can associate a byte offset/data-mask with the currently entered trigger.

— You can select the segment of the currently entered trigger in field 5.

— You can select the message portions of the trigger in fields 6,8, 10 and 12.

— You can select the port portions of the trigger in fields 7,9, 11 and 13.

Field 2 — Select Trigger

This is the number of the trigger, from 1-9, you want to display.

Field 3 — Build Trigger

This is the number, from 1-9, of the trigger you want to build or modify.

Field 4 — Mask

A byte offset/data-mask built in test 7 can be associated with the currently displayed trigger.

0=No byte offset/data-mask
l=Byte offset/data-mask built in test 7 for this trigger

Field 5 — Segment

You can specify up to six trigger elements in a trigger. The first four trigger elements are in segment 1 and the last two are in segment 2. A segment number must be entered before entering trigger data.

l=Messages 1-4
2=Messages 5-6

Fields 6-13 — DCIU Event Triggers

These fields define the triggers.

Fields 6, 8, 10, 12, — Event Code

These are the encodes for the messages composing the trigger elements.
10=Outgoing application message
11=Incoming application message
12=Application error-no buffer

13=Application error-port not available
14=Application error-message too long
15=Application error-DTM port
16=DTM port application error-file transfer in progress
17=DTM port application error-port not available
18=DTM port application error-file too long
19=DTM port application error-not a DTM port
20=Outgoing session connect
21=Outgoing session accept
22=Outgoing session reject
23=Outgoing session disconnect
24=Outgoing session resynchronization acknowledge
25=Incoming session connect
26=Incoming session accept
27=Incoming session reject
28=Incoming session disconnect
29=Incoming session resynchronization
30=Confirmation message
40=Reset logical channel
41=Resend messages
42=Send resynchronization message
43=Turn port on
44=Turn port off
45=Session layer ack reset of logical channel
46=DCIU ack reset of logical channel
47=DCIU ack resend of messages
48=DCIU ack resending of resynchronization
49=DCIU ack turning port off
50=DCIU requests reset of logical channel
60=Timer expired-session connect
6l=Timer expired-session retransmission
62=Timer expired-resynchronization
63=Timer expired-abort session 1
64=Tmer expired-abort session 2
70=Outgoing messages lost
7l=Dip icom record aborted
72=Unrecognizable alternate routing field
73=Unrecognizable session layer header
74=Unrecognizable opcode

Fields 7, 9, 11, 13 — Port

The DCIU port number in the range 1 to 64.

TEST 7

Test 7 is used to build byte offset/data-masks to further define a trigger. Using a byte offset/data-mask with a trigger allows you to trigger the tracer on or off based on matching data within individual bytes of data in the message. If a byte offset/data-mask is not specified, the detection of the message alone will trigger the tracer. For example, with the proper byte offset/data-mask set, you can trigger the tracer upon detection of the distinctive ringing message from a given extension or range of extensions. Without the byte offset/data-mask set, however, the tracer would be triggered upon detection of any application message from any extension.

Note that to build a byte offset/data-mask, you must have supplementary documentation such as the DCIU message set specifications, in addition to these procedures. This supplementary documentation is proprietary and is thus available only to authorized personnel.

To View the Test 7 Screen

1. To see the test 7 screen, enter **t7** from anywhere within procedure 959. The test 7 screen, similar to the following, appears.

```
┌──────────────────────────────────────────────────────────────────────┐
│                 ENHANCED MODE-PROCEDURE: 959, TEST: 7                  │
│                   DCIU BYTE OFFSETS AND MASKS                          │
│                                                                        │
│   2.    Trigger Number : [-]                                           │
│   3.  Trigger Element: [-]                                             │
│   4.          Segment : [-]                                            │
│   5.           Offset : [----]                                         │
│                                                                        │
│  DATA OR MASK                                                          │
│     6. Data: [----]                                                    │
│     7. Mask: [----]                                                    │
│                                                                        │
│  DATA OR MASK                                                          │
│     8. Data: [----]                                                    │
│     9. Mask: [----]                                                    │
│                                                                        │
│  10. Logical Operator : [-]                                           │
│                                                                        │
│                                                                        │
│  Connected to CC0 ON-LINE ♡ [ MAJOR ] [ MINOR ] [ RUN TAPE ] [ BUSY OUT ] [ IN USE ] [ WAIT ] │
│                                                                        │
│  enter command: ▫                                                      │
│  [      ][      ][3 Data ][      ][5 Help ][6 Field ][7 Input ][8 Cmds ] │
└──────────────────────────────────────────────────────────────────────┘
```

Test 7 Overview

A byte offset/data-mask is composed of the following elements:

- The trigger number is the number of the trigger you build in test 6 for which you want to build a byte offset/data-mask.

- The trigger element is the message (up to six messages per trigger) for which you want to build the byte offset/data-mask. You can build a byte offset/data-mask for any or all trigger elements in a trigger.

- The segment defines which byte offset/data-mask combinations you are building or displaying. A total of three byte offset/data-mask segments per message (trigger element) are possible. Each segment consists of a byte offset and two data-mask pairs (fields 5 through 9). This yields a total of three byte offsets and six data-masks per message (trigger element).

- The byte offset specifies how many bytes (the first byte is byte 0) into the message to look for a match. This includes the special data bytes, if any. For example, if a message is preceded by two bytes of special data, the first byte of the message is at offset 2.

  Each new segment must begin with a new byte offset, even if the bytes are contiguous with the previous segment.

  Also, each byte offset must differ by at least two bytes from the other two byte offsets.

- The data field specifies a byte of data to try to match at the offset location. The data ranges from 00 to FF hex. This is coded in decimal, however, from 0000 to 1515.

- The mask field specifies how to match each bit of the data field. A 1 in the mask field means to exactly match the corresponding digit in the data field. A 0 in the mask field means a 0 or a 1 will both match the corresponding bit in the data field. Thus, 1515 (FF hex) in the mask field means to exactly match the data and 0000 in the mask field means the data field is a total wild card.

- The logical operator allows you to logically AND or to logically OR the adjacent segments. For example, if the logical operator for segment 1 is a 1, then a match will occur if the data in segment 1 and the data in segment 2 are both true.

Following is an example of how these fields might work:

Assume trigger number 1 has been built and it consists of one message, an outgoing application message. Also assume that we want to trigger the tracer only upon detecting the distinctive ringing message, which is one of the outgoing application messages, from a certain range of extensions, say 815XX. Without using a byte offset/data-mask with this trigger, this would not be possible because the tracer would trigger upon detecting any of the many outgoing application messages from any extension. To build this byte offset/data-mask involves the following steps:

- The trigger number 1 is entered in field 2.

- The trigger element number of the trigger is entered in field 3. This is **1** because we are building the byte offset/data-mask for the first (and only) trigger element of the trigger.

- The segment is **1.**

- The offset for segment 1 is **3.** This setting means to look at the fourth byte of the message, which is the byte containing the feature code, beginning with the special data bytes. For outgoing application messages, two bytes of special data always precede the first byte of the message.

- Field 6 contains the data you are looking for. In this case, we want to look for the feature code for the distinctive ringing message, which is 0001.

- Field 7 is the mask for the data in field 6. Since we are looking for an exact match on the data in field 6, the mask should beset to 1515. Fields 8 and 9 of segment 1 are not needed, but it is required that data be entered anyway. Since it does not matter what values are in this byte, you can enter anything into field 8 and 0000 into field 9.

- At this point, we have defined the trigger to match on any outgoing distinctive ringing message. Now we want to further refine it to match on those messages from five-digit extensions beginning with 815. We start by going to segment 2.

- The logical operator in field 10 should be set to 1, meaning the data in segment 1 AND the data in segment 2 must both be present for a match to occur.

- The segment 2 offset is 8, meaning the seventh byte of the message. This is the location of the byte containing the fourth and third most significant digits of the originating station (digits 1 and 5 in 815XX).

- Field 6 data is 0105 for the digits 1 and 5.

- The field 7 mask is 1515 because we are looking for an exact match of the digits.

- Field 8 data is the next byte of the message, which contains the second and first digits of the number. In this case we do not care what these numbers are, so this field can contain any data. Field 9 should then contain 0000, which says all the data in field 8 are don't-cares. Placing all 0s in the mask makes a wildcard out of the data field.

- We must now go to segment 3.

- Again, the logical operator is 1 because we want the data in segment 2 AND the data in segment 3.

- The segment 3 offset should be 11 because the tenth byte of the message is where the sixth and fifth digits of the originating station are located. We do not care about the sixth digit.

- The field 6 data should be 0008 for the 8 in 815XX.

- The field 7 mask should be 0015 (OF hex, or 0000 1111), meaning we do not care about what is in bit positions 7, 6, 5, or 4 but that we want an exact match on the 8 in bit positions 3, 2, 1 and 0.

- The byte offset/data-mask is now built for trigger number 1.

To Build a Mask

1. Enter **cf 2** and enter the trigger number for the byte offset/data-mask you are building.

2. Enter **cf 3** and enter the trigger element for the byte offset/data-mask you are building.

3. Enter **cf 4** and select one segment for the byte offset/data-mask you are building. If you are building a new byte offset/data-mask, start with segment 1.

4. Enter the offset in field 5.

5. Enter the data you want to match in fields 6 and 8.

6. Enter the masks for the data in fields 7 and 9.

7. Enter **cx** to save the mask you built. You can enter **cx** at any time. If you want you can wait until you are finished with all three segments before entering **cx.**

To View Byte Offset/Data-Masks

1.   Enter **cf 2** and enter the trigger number for the byte offset/data-mask.

2.   Enter **cf 3** and enter the trigger element for the byte offset/data-mask.

3.   Enter **dx** to view the data for the first segment of the byte offset/data-mask you selected.

     If you enter the segment number, the trigger number, and the trigger element number, the data for the segment you entered will appear.

4.   Entering **nu** advances you from the first segment of one trigger element to the first segment of the next element in the same trigger and so on until the last element of the trigger is reached. The next **nu** then displays all dashes, and the next one then starts over with the first element of the first trigger.

5.   Entering **nd** advances you from one segment to the next segment within an element, When the last segment of an element is reached, all fields from the segment field on are dashed until **nd** is pressed again. The first segment of the element is then displayed.

To Remove a Byte Offset/Data-Mask

You cannot remove the byte offset/data-mask for a trigger if field 4 in test 6 is set to 1. In other words, if test 6 specifies a mask is to be used with a trigger, then that mask must be defined in this test.

You can remove all the byte offset/data-masks for a single trigger element or for an entire trigger as follows:

1.   To remove all the byte offset/data-masks for a whole trigger, enter **cf 2** and enter the trigger number. Enter **cdx** to remove the byte offset/data-masks for the trigger displayed.

2.   To remove the byte offset/data-mask for an individual trigger element, enter **cf 2** and enter the trigger number. Enter **cf 3** and the trigger element. Enter **cdx** to remove the byte offset/data-mask for the trigger element displayed.

Input Fields:

— You can select a numbered trigger in field 2.

— You can select a numbered trigger element in field 3.

— You can select a segment of the byte offset data/mask in field 4.

— You can select the offset to the data or to the mask in field 5.

— You can select the data and masks in fields 6-9.

— You can select a logical operator in field 10.

Field 2 — Trigger Number

Use field 2 to select a trigger number, built in test 6, for which you want to build a byte offset/data-mask. Note that you must build the byte offset/data-mask before you can specify it for a trigger in test 6.

Field 3 — Trigger Element

Use field 3 to select one of the trigger elements in a trigger built in test 6. Note that you must build the byte offset/data-mask before you can specify it for a trigger in test 6.

Field 4 — Segment

Each trigger element can have up to three byte offset/data-mask segments. Each segment is composed of one byte offset and two data-mask pairs.

Field 5 — Offset

This field specifies the byte within the message at which you want to match data. The first byte of "special data" is byte 0. Outgoing application messages are always preceded by two bytes of special data. Incoming application messages are preceded by one byte of special data. Thus, the third byte of an outgoing application message is at offset 4, for example.

Note that every byte offset must differ by at least two bytes from the other two offsets. For example, if the segment 1 offset is 8, the segment 2 offset must be either less than or equal to 6 or greater than or equal to 10. This is because each segment contains two bytes of data.

Fields 6, 8 — Data

Data in the range 0 to 1515 or dash. The left two digit fields can be a number from 00 to 15, corresponding to the hex values 0 to F. Likewise, the right two digit positions can be a number from 00 to 15. Thus, the value 79 hex would be entered as 0709 and the hex value AF would be entered as 1015.

Fields 7, 9 — Mask

Mask in the range 0 to 1515 or dash. The values in these fields determine how to match the data in fields 6 and 8. When the mask data is expanded to binary, a 0 in the mask means to treat the corresponding bit in the data as a don't-care. A 1 in the mask means to match the corresponding data bit exactly. For example, assume field 6 contains 0812 and its mask contains 1514. The data byte, when expanded to binary, contains the bits 10001100 and the mask contains the bits 11111110. This combination means the data-mask will match either a byte of data in the message containing 10001100 or 10001101.

Note that the two data-mask pairs in a segment are linked by a logical AND, meaning a match occurs only when the data-masks in fields 6/7 AND 8/9 are both matched.

Field 10 — Logical Operator

This field links the first and second segments and the second and third segments. Enter a 0 if you want to match on the data in one segment OR the data in the next segment. Enter 1 if you want to match on the data in one segment AND the data in the next segment. The field must be dashed for the last defined segment.

dash=End of mask
0=Or
1=And

TEST 8

Test 8 is used to display the number of times each message type has been detected by the tracer on the port or ports specified in test 4. When a message is detected, a counter is "pegged" for that particular message. If pegs are enabled in test 4 and a filter is specified, test 8 pegs all message types, regardless of the specified filter.

To View the Test 8 Screen

1. To see the test 8 screen, enter **t8** from any point within procedure 959. The test 8 screen, similar to the following, appears.

```
                    ENHANCED  MODE-PROCEDURE  :  959,  TEST  :  8
                             DISPLAY  DCIU  PEG  COUNTS

DCIU  PEGGED  EVENT
    2.  Event  Code: --
    3.       Data: -----

DCIU  PEGGED  EVENT
    4.  Event  Code: --
    5.       Data: -----

DCIU  PEGGED  EVENT
    6.  Event  Code: --
    7.       Data: -----




Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▭
|_____||_____||3 Data  ||_____||5 Help ||6 Field ||7 Input ||8 Cmds |
```

To View Peg Data

To capture peg data, pegs must be enabled in test 4, field 11 and either one port or all translated ports must also be set in test 4. To display the captured peg data, however, it is not necessary to have pegs enabled.

To display peg data for the specified port or ports, enter **nd.**

Each time you press **nd,** pegs for three message types will be displayed. All message types (currently 42 message types are defined) are displayed by successively pressing **nd.** The peg number shown is the number of pegs to that point in time if the tracer is currently enabled, or the number of pegs in the last trace if it is not currently enabled.

After you view all peg data the switch dashes all fields. If you enter **nd** again, the first peg data appears.

Fields 2, 4, 6 — Event Code

Pegs are displayed for each of the following message types:
10=Outgoing application message
1l=Incoming application message
12=Application Error-no buffer
13=Application error-port not available
14=Application error-message too long
15=Application error-DTM port
16=DTM port application error-file transfer in progress
17=DTM port application error-port not available
18=DTM port application error-file too long
19=DTM port application error-not a DTM port
20=Outgoing session connect
21=Outgoing session accept
22=Outgoing session reject
23=Outgoing session disconnect
24=Outgoing session resynchronization acknowledge
25=Incoming session connect
26=Incoming session accept
27=Incoming session reject
28=Incoming session disconnect
29=Incoming session resynchronization
30=Confirmation message
40=Reset logical channel
4l=Resend messages
42=Send resynchronization message
43=Turn port on
44=Turn port off
45=Session layer ack reset of logical channel
46=DCIU ack reset of logical channel
47=DCIU ack resend of messages
48=DCIU ack resending of resynchronization
49=DCIU ack turning port off
50=DCIU requests reset of logical channel
60=Timer expired-session connect

61=Timer expired-session retransmission
62=Timer expired-re-synchronization
63=Timer expired-abort session 1
64=Timer expired-abort session 2
70=Outgoing messages lost
71=Dip icom record aborted
72=Unrecognizable alternate routing field
73=Unrecognizable session layer hinder
74=Unrecognizable opcode

Fields 3, 5, 7 — Data

Data in the range 0 to 99999 or dash.

Special Error Codes

25=The data capture buffer does not contain data for DCIU MST. (Tests 2, 3)

28=Unless you want a complete wildcard trigger element, you must enter data in all fields of a trigger element from the point at which you start entering to the end of the trigger element, even if you want those fields dashed. (Test 6)

31=You must enter an ON trigger. (Test 5)

32=You must enter an OFF trigger or COUNT (Test 5)

33=You must enter an ON trigger and an OFF trigger or an ON trigger and COUNT (Test 5)

36=Disable the DCIU MST before you setup the filter, buffer control options or gating control options. (Tests 4,5)

40=This trigger does not exist-go to Test 6 and create it. (Test 5)

40=You entered an event trigger that doesn't exist. Enter "nu" to view all defined event triggers. (Test 6)

41=The event trigger you are trying to build already exists. If you are rebuilding the trigger, re-enter the build event number. If you do not want to re-build the trigger, enter another build event number. Enter "nu" to view all defined event triggers. (Test 6)

42=Select a different event code. You entered an invalid event code. Check the list of valid event codes. (Test 6)

43=The port selected as part of a trigger has not been selected as part of the filter. (Tests 1,2,3, 5)

44=Enter an event trigger in field 2 or 3. You entered a trigger event segment or you entered "nd" before you entered an event trigger number in fields 2 or 3. Select an event trigger number in field 2 or 3. You may have entered 'cdx' with no select event number entered in field 2. Select an event in field 2. (Test 6)

44=You must enter a number in field 2 or field 3 or both. You tried an operation which requires a numbered entry in field 2 or field 3. (Test 7)

45=You must enter an event number in the build event field. You are attempting to enter event trigger data but you are not in the build event mode. (Test 6)

46=Fields 10-13 cannot have data in segment 2. (Test 6)

47=There are no triggers built at this time. (Test 6)

48=You have entered 'cdx' in the build trigger mode. This operation is valid only in the select event mode. (Test 6)

49=You are trying to add an event trigger for which no data or incomplete data has been entered. Enter trigger data in fields 5-13 before the 'cx' sequence. (Test 6)

50=You cannot enable the DCIU MST because the ISDN MST is enabled. If you want to enable the DCIU MST you must go to Procedure 949 and disable the ISDN message tracer and check to ensure that the buffer is not reserved for ISDN. Note that all ISDN data will be lost when you start the DCIU MST. (Tests 1, 2, 3, 5)

51=The MST buffer is already reserved for the ISDN message sequence tracer. Go to Procedure 949 to see if the ISDN MST is running. Examine the stop time status to see if the data is current. Check with the system administrator to find why the buffer is reserved. If the data is no longer required then disable or unreserve the ISDN buffer. (Tests 1, 2, 3, 5)

52=The DCIU MST is already enabled. (Tests 1, 2, 3, 5)

53=Enter "x x" to enable the message sequence tracer. (Tests 1, 2, 3, 5)

54=Enter "x" again to enable the message sequence tracer. You entered "x" once. You must enter "x" two times to enable the message sequence tracer. (Tests 1, 2, 3, 5)

55=You must select DCIU MST filters. You tried to run the tracer without first selecting the filters. Go to test 4 and select the filters. (Tests 1, 2, 3, 5)

56=You must select a timer code and a run time. You tried to run the tracer without first selecting the run time. Go to test 5 and select the run time. (Tests 1, 2, 3, 5)

57=Data/mask is required in previous segment. (Test 7)

58=The message sequence tracer is already stopped. You entered "s" to disable the tracer but the tracer is already stopped. (Tests 1, 2, 3, 5)

59=Enter "dx" to go to the start or end of the buffer (based on direction). If the search direction is forward, "dx" will return to the start of the buffer. If the search direction is backwards, "dx" will return to the end of the buffer. (Tests 2, 3)

88=System clock error. DCIU MST will disable itself. (Tests 1, 2, 3, 5)

89=A segment of a mask was entered which is not linked to the previous segment with a logical operator. Add a logical operator before proceeding to a new segment. (Test 7)

90=You entered "nu" and no translated DCIU ports were found in a partial search of switch DCIU port translations. (Test 4)

91=You entered "nu" and no translated DCIU ports were found in a complete search of switch DCIU port translations. (Test 4)

92=Attempting to add a mask which has no data specified. (Test 7)

92=The DCIU port in field 2 is not translated or no ports are translated. (Test 4)

93=No masks have been specified. (Test 7)

94=You entered a byte offset which overlaps a previous byte offset. This in effect provides a multiple data specification for the same offset and is not allowed. Select a new offset. (Test 7)

95=You entered data which exceeds the limits for this field. The maximum data in each half of the field is 15. Re-enter your data. (Test 7)

97=A mask is required for the trigger. If a trigger is being added which has a mask specified, the mask must exist. If masks are being removed which are specified as part of a trigger, the mask must be removed as part of the trigger. (Tests 6, 7)

98=You entered data which requires a previous entry in the segment field and the offset field. (Test 7)

PROCEDURE 960 - QUEUE ACTIVITY

Purpose

Use Procedure 960 to see queue information for an equipment location, to see the equipment locations on a queue, or to view dynamic queue information.
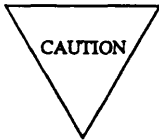
⚠ CAUTION — This procedure is for use by authorized personnel only. If you use this procedure you may damage the switch or void the switch warranty.

Tests

Procedure 960 has two tests.

- Use test 1 to see queue information for a selected equipment location.

- Use test 2 to see dynamic queue information and the first trunk in queue for a selected euipment location.

Procedure Overview

A queue is an ordered sequence of items. Queues may contain, for example, intercom records, service circuits (such as tone generators), attendant services, or trunks.

Use Procedure 960 to examine items in queues and find their status.

Test 1 - Operation

Use test 1 to see queue information for a selected equipment location.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   ● If you are already in the procedure, but not in test 1, enter `t1`

   ● Otherwise, enter `p960`

   The test 1 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────┐
│         ENHANCED MODE - PROCEDURE: 960, TEST: 1              │
│                    QUEUE ACTIVITY                            │
│                                                             │
│ EQUIPMENT LOCATION                                          │
│    2.   Module:  ▢                                          │
│    3.  Cabinet:  ▢                                          │
│    4.  Carrier:  ▢                                          │
│    5.    Slot :  ▢                                          │
│    6.  Circuit:  ▢                                          │
│                                                             │
│  7. Busied or Unequipped:  ▢                               │
│  8.          Queue Number:  ▢                              │
│  9.    Trunk Group Number:  ▢                              │
│ 11.          Queue Length:  ▢                              │
│ 12.           Trunk Type :  ▢                              │
│ 13. Qbit : ▢                                                │
│                                                             │
│                                                             │
│                                                             │
│ Connected to CC0 ON-LINE ♡ │MAJOR││MINOR││RUN TAPE││BUSY OUT││IN USE││WAIT│ │
│                                                             │
│ enter command: ▬                                            │
│ │     ││    ││F3 DATA ││    ││F5 HELP││F6 FIELD││F7 INPUT││F8 CMDS│ │
└─────────────────────────────────────────────────────────────┘
```

   The switch highlights field 2.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To See Queue Activity by Equipment Location

1. To select an equipment location, enter cf2 and enter the module, cabinet, carrier, slot, and circuit.

    You can enter cf and enter the number of the field you want to change.

2. Enter x to view queue activity.

    The queue activity on your screen does not change unless you enter x

    Field 7 shows the maintenance busy status (see Table 7-l).

    Field 13 shows the queue activity (see Table 7-2). If field 13 contains a 0 there is no more information.

    For the trunk equipment location on your screen, the following appears.

    Fields 2-6 show the trunk equipment location.

    Fields 4-6 show the internal trunk record number when field 7 contains a 2.

    Field 7 shows the maintenance busy status for the trunk (see Table 7-l).

    Field 8 shows the queue number or contains a dash if the trunk is not in queue.

    Field 9 shows the trunk group number or contains a dash if the trunk is not in queue.

    Field 11 shows the queue length or contains a dash if the trunk is not in queue.

    Field 12 shows the trunk type.

    Field 13 shows the queue bit (see Table 7-2).

3. To see updated queue activity, enter x again.

4. If you want to select another equipment location, repeat steps 1-3.

5. If you want to see queue information go to test 2.

Test 2 - Operation

Use test 2 to see queue activity and the first trunk in queue for a selected queue number.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter `p960`

   - If you are already in the procedure, but not in test 2, enter `t2`

     The test 2 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 960, TEST: 2
                        QUEUE ACTIVITY


EQUIPMENT LOCATION
   2.   Module: □
   3. Cabinet: □
   4. Carrier: □
   5.     Slot: □
   6. Circuit: □

 7. Busied or Unequipped: □
 8.           Queue Number: □
 9.   Trunk Group Number: □
10.          Queue Index: □
11.         Queue Length: □
12.           Trunk Type: □




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[        ][      ][F3 DATA ][      ][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

Fields 2-6 may contain a default equipment location from test 1.

Field 8 may show the queue number of the default number. The switch highlight field 8.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To See Queue Activity for a Queue

1. To select a specific queue, enter `cf8` and then enter the queue number in field 8.

2. Enter `x` to see dynamic queue information.

    Fields 2-6 show the trunk equipment location or other data depending on the status.

    Field 7 shows the status (see Table 7-l). If field 7 contains a 2, fields 4-6 show an internal trunk number and fields 2-4 are dashed.

    Field 8 shows the queue number.

    Field 9 shows the trunk group number.

    Field 10 shows the queue index.

    Field 11 shows the queue length.

    Field 12 shows the trunk type.

3. Enter `nc` to see each trunk in the queue.

    Fields 2-6 show the trunk equipment location or other data depending on the status.

    Field 7 shows the status (see Table 7-l). If field 7 contains a 2, fields 4-6 show an internal trunk number and fields 2-4 are dashed.

    Field 8 shows the queue number.

    Field 9 shows the trunk group number.

    Field 10 shows the queue index.

    Field 11 shows the queue length.

    Field 12 shows the trunk type.

4. If you want to see the next trunk in the queue repeat steps 3 and 4.

    After you view all trunks in queue, the switch dashes fields 2-7, 12 and 13. If you enter `nc` again, the first equipment location in queue appears.

5. If you want to see the next queue, enter `nu`

   Fields 2-6 show the trunk equipment location or other data depending on the status.

   Field 7 shows the status (see Table 7-l). If Field 7 contains a 2, fields 4-6 show an internal trunk number and fields 2-4 are dashed.

   Field 8 shows the queue number.

   Field 9 shows the trunk group number.

   Field 10 shows the queue index.

   Field 11 shows the queue length.

   Field 12 shows the trunk type.

6. To view information for the new queue repeat steps 3-6.

   After you view all queues the switch dashes fields 2-8 and 12. Fields 9-11 contain a 0. If you enter `nu` again the first queue appears.

7. If you want to select another queue, without stepping through all queues, repeat steps 1-6.

8. If you want to see queue activity go to test 1.

Special Error Codes

```
81 = Circuit assigned to attendant interface
```

TABLE 7-1   **TABLE 7-2**

Field 7 Maintenance Busy Status
0   =   Not busied out
1   =   Maintenance busied out
2   =   Pseudo trunk

Field 13 Qbit
0   =   Not on any queue
1   =   On idle queue
2   =   On a busy queue without Qbit set (error condition)
3   =   On a busy queue

Procedure Fields

You can enter data in the following fields,

- In test 1 you can select a specific equipment location in fields 2-6.
- In test 2 you can select a specific queue number to find the equipment locations on the queue in field 8.

The meaning of the fields are:

2.	EQUIPMENT LOCATION	Shows the equipment location of the queue.
7.	Busied or Unequipped	Shows the maintenance busy status of the queue and whether the queue is equipped with hardware. Table 7-1 shows the maintenance busy status encodes.
8.	Queue Number	Shows the number of the queue that contains the trunk.
9.	Trunk Group Number	Shows which trunk group you are currently viewing.
10.	Queue Index	Shows which item in the queue you are currently viewing.
11.	Queue Length	Shows the length of the queue you are viewing.
12.	Trunk Type	Shows the trunk type.
13.	Queue status	Shows the in-queue status of the trunk. Table 7-2 shows the queue status encodes.

PROCEDURE 961 - CONNECTION ACTIVITY

Purpose

Use Procedure 961 to see the connection information based on connection number, time slot identity accumulator number, equipment location or DTDM equipment location, and to find the connection number and first active accumulator in a module.

⚠ CAUTION
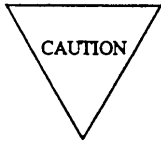
For use by authorized personnel only. If you use this procedure you may damage the switch or void the switch warranty.

Tests

Procedure 961 has five tests.

- Use test 1 to find the equipment location, constat table number, acport table number, and timeslot information for a selected connection number.

- Use test 2 to find the connection number and constat table number for a selected time slot identity accumulator number.

- Use test 3 to find the constat table number, acport table number, connection number, and timeslot identity accumulator number for a selected equipment location.

- Use test 4 to find the connection number and the first active accumulator on a module.

  Use test 5 to find the constat table number, acport table number, connection number, and timeslot identity accumulator number for a selected DTDM equipment location.

Procedure Overview

Use Procedure 961 to get connection activity information. Connection information comes from the internal software tables.

In tests 1-3 you can get connection information if you know the connection number, timeslot identity accumulator number, or equipment location. In test 4, you can enter a module number to find the connection number or first active accumulator in the module. Test 5 is useful, in modem pooling, to get connection information for a DTDM equipment location.

Test 1 - Operation

Use test 1 to find the equipment location, constat table number, acport table number, and timeslot information for a selected connection number.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

   - If you are already in the procedure, but not in test 1, enter `t1`

   - Otherwise, enter `p961`

   The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 961, TEST: 1
                     CONNECTION ACTIVITY

 2. Connection Number (Octal) : ▢   14. Number of Ports In Connection: ▢
 3.            Busy/Idle Bit: ▢     15. Port Index: ▢
 4.      Constant Table Number: ▢

TIME SLOT IDENTITY
   6.          Module: ▢
   7. Accumulator Number: ▢

 8. ACPORT Table Number: ▢

EQUIPMENT LOCATION
   9.  Module: ▢
  10. Cabinet: ▢
  11. Carrier: ▢
  12.   Slot : ▢
  13. Circuit: ▢


Connected to CC0 ON-LINE ♡ | MAJOR || MINOR || RUN TAPE || BUSY OUT || IN USE || WAIT |

enter command: ▄                                              ˜
|_____||_____|| F3 DATA ||_____|| F5 HELP || F6 FIELD || F7 INPUT || F8 CMDS |
```

The switch may highlight field 2.

Field 2 may show a default connection number from tests 2-5.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Get Connection Information by Connection Number

1. To select a connection number enter `cf2` and enter the connection number (in octal).

2. Enter x to get information about the connection number you selected.

    Field 3 shows the connection number status (see Table 7-3). If the connection is maintenance busied there is no more information.

    If the connection is not maintenance busy the following appears.

    Field 2 shows the connection number.

    Field 3 shows the busy status bit (see Table 7-3).

    Field 4 shows the constat table number in decimal.

    Fields 6 and 7 show the module and accumulator number in decimal.

    Field 8 shows the acport table number in decimal.

    Fields 9-13 show the equipment location on the connection.

    Field 14 shows the number of ports on the connection.

    Field 15 shows the port index.

3. Enter `nc` to see each port in the acport tables.

    Field 8 shows the acport table number.

    Field 14 shows the number of acport tables being used for the current constat table number in field 4.

4. If this is not the last port you want to view, repeat steps 2-4.

    After you view all ports in the acport table, the switch dashes fields 8-15. If you enter `nc` again, the first entry appears.

5. If you want to see each constat number, enter **nu**

    The number in field 4 decreases by one as you view each constat table number.

6. If this is not the last constat table number, repeat steps 5 and 6.

    After you view all constat table numbers, the switch dashes fields 2-13 and 15. If you enter `nu` again, the first entry appears.

7. Enter **nd** to see the next busy connection number and the data for that connection.

   After you view all busy connection numbers, the switch dashes fields 2-15. If you enter **nd** again, the first entry appears.

8. If you want to select another connection number repeat steps 1-8.

9. If you want to see connection status activity and you know the timeslot number and accumulator number, go to test 2.

10. If you want to see connection status activity and you know the equipment location, go to test 3.

11. If you want to find the connection number and first active accumulator in a module, go to test 4.

12. If you want to see connection status activity and you know the DTDM equipment location, go to test 5.

Test 2- Operation

Use test 2 to find the connection number and constat table number for a selected time slot identity accumulator number.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   - To start the procedure, enter p961

   - If you are already in the procedure, but not in test 2, enter t2

     The test 2 screen, similar to the following, appears.

```
┌─────────────────────────────────────────────────────────────────┐
│              ENHANCED MODE -  PROCEDURE: 961, TEST: 2             │
│                       CONNECTION  ACTIVITY                        │
│                                                                   │
│ 2. Connection Number (octal) :  ☐                                │
│ 3.             Busy/idle bit:  ☐                                 │
│ 4.     Constant table number:  ☐                                │
│ 5. In Use: ☐                                                     │
│                                                                   │
│ TIME SLOT IDENTITY                                                │
│   6.          Module:  ☐                                         │
│   7. Accumulator Number:  ☐                                      │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│                                                                   │
│ Connected to CC0 ON-LINE ♡ ┌─MAJOR─┐┌─MINOR─┐┌─RUN TAPE─┐┌─BUSY OUT─┐┌─IN USE─┐┌─WAIT─┐ │
├─────────────────────────────────────────────────────────────────┤
│ enter command: ▂                                                  │
│ ┌────────┐┌────────┐┌F3 DATA─┐┌────────┐┌F5 HELP─┐┌F6 FIELD┐┌F7 INPUT┐┌F8 CMDS┐ │
└─────────────────────────────────────────────────────────────────┘
```

The switch highlights field 6,

Fields 6 and 7 may contain default module number and accumulator number from test 1 or tests 3-5.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Get Connection Information by Accumulator Number and Module

1. To select a module and accumulator, enter `cf6` and then enter the module and accumulator number in decimal.

2. To see the connection number and constat number, enter `x`

   The switch searches all constat tables for the module and accumulator number you selected.

   If the switch finds the module and accumulator number the following appears.

   > Field 2 shows the connection number.

   > Field 4 shows the constat table number.

   > Field 5 contains a 1 (see Table 7-4).

   > Field 6 shows the module number.

   > Field 7 shows the accumulator number.

   If the switch cannot find the module and accumulator the following appears.

   > Field 4 contains a `1`.

   > Field 5 contains a 0 since the accumulator is idle (see Table 7-4).

3. If you want to find connection information for another accumulator and module, repeat steps 1-3.

4. If you want to see connection status activity and you know the connection number, go to test 1.

5. If you want to see connection status activity and you know the equipment location, go to test 3.

6. If you want to find the connection number and first active accumulator in a module, go to test 4.

7. If you want to see connection status activity and you know the DTDM equipment location, go to test 5.

Test 3 - Operation

Use test 3 to find the constat table number, acport table number, connection number, and timeslot identity accumulator number for a selected equipment location.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   ● To start the procedure, enter `p961`

   ● If you are already in the procedure, but not in test 3, enter `t3`

     The test 3 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 961, TEST: 3
                    CONNECTION ACTIVITY

 2. Connection Number (Octal) : ⬜    14. Number of ports in connection: ⬜
 3.              Busy/Idle Bit: ⬜    15. Port Index: ⬜
 4.     Constant Table Number: ⬜
 5. In Use: ⬜


TIME SLOT IDENTITY
  6.            Module: ⬜
  7. Accumulator Number: ⬜


 8. ACPORT Table Number: ⬜


EQUIPMENT LOCATION
  9.   Module: ⬜
 10. Cabinet: ⬜
 11. Carrier: ⬜
 12.    Slot: ⬜
 13. Circuit: ⬜

Connected to CC0 ON-LINE ♡ ┃ MAJOR ┃┃ MINOR ┃┃ RUN TAPE ┃┃ BUSY OUT ┃┃ IN USE ┃┃ WAIT ┃
_____
enter command: ▬
┃_____┃┃_____┃┃F3 DATA┃┃_____┃┃F5 HELP┃┃F6 FIELD┃┃F7 INPUT┃┃F8 CMDS┃
```

     Fields 9-13 may contain a default equipment location from tests 1, 2, 4, or 5.

     The switch may highlight field 9.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Get Connection Information by Equipment Location

1. To select an equipment location enter `cf9` and enter the module, cabinet, carrier, slot, and circuit.

2. Enter `x` to get the constat table number for the equipment location in fields 9-13.

   `WAIT` appears on your screen.

   The switch searches all the acport tables for equipment location you selected.

   When the search is over, `WAIT` disappears from your screen.

   If the equipment location is not found, field 5 contains a 0 and no other information appears.

   If the equipment location is found in the acport tables, the following information appears.

   > Field 2 shows the connection number.

   > Field 4 shows the constat table number.

   > Field 5 contains a 1 (see Table 7-4).

   > Fields 6 and 7 shows the timeslot identity.

   > Field 8 shows the acport table number.

   > Fields 9-13 show the equipment location you selected.

3. If you want to select another equipment location, repeat steps 1-3.

4. If you want to see connection status activity and you know the connection number, go to test 1.

5. If you want to see connection status activity and you know the timeslot number and accumulator number, go to test 2.

6. If you want to find the connection number and first active accumulator in a module, go to test 4.

7. If you want to see connection status activity and you know the DTDM equipment location, go to test 5.

Test 4 - Operation

Use test 4 to find the connection number and the first active accumulator in a module.

In test 4 you can:

To View the Test 4 Screen

1. To see the test 4 screen, choose one or both of the following:

   - To start the procedure, enter `p961`

   - If you are already in the procedure, but not in test 2, enter `t4`

     The test 4 screen, similar to the following, appears.

```
                    ENHANCED MODE - PROCEDURE: 961, TEST: 4
                              CONNECTION ACTIVITY

2. Connection Number (octal) : ⬜
4.     Constant Table Number: ⬜
5. In Use: ⬜

TIME SLOT IDENTITY
  6.            Module: ⬜
  7. Accumulator Number: ⬜













Connected to CC0 ON-LINE ♡  MAJOR   MINOR   RUN TAPE   BUSY OUT   IN USE   WAIT

enter command: ▭
              F3 DATA          F5 HELP  F6 FIELD  F7 INPUT  F8 CMDS
```

     The switch highlights field 6.

     A default module may appear from test 1, 2, 3 or 5.

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Get Connection Information by Module

1. To select a module enter `cf6` and enter the module number.

2. Enter `x` to find the connection number and first active accumulator in the module.

       Field 2 shows the connection number.

       Field 4 shows the constat table number.

       Field 5 contains a `1` (see Table 7-4).

       Field 6 shows the module number you seleced.

       Field 7 shows the first active accumulator in the module.

3. Enter `nc` to see the next active accumulator for the module in field 6.

       Field 2 shows the connection number for the accumulator.

       Field 6 shows the module.

       Field 7 shows the accumulator number.

After you view all active accumulators in the module, the switch dashes fields 2-15. If you enter `nc` again, the first active accumulator for the module appears.

4. Enter `nu` to see the next module.

       Field 6 shows the next module.

After you view all modules, the switch dashes fields 2-15. If you enter `nu` again, the first entry appears.

5. If you want to see connection status activity and you know the connection number, go to test 1.

6. If you want to see connection status activity and you know the timeslot number and accumulator number, go to test 2.

7. If you want to see connection status activity and you know the equipment location, go to test 3.

8. If you want to see connection status activity and you know the DTDM equipment location, go to test 5.

Test 5 - Operation

Use test 5 to find the constat table number, acport table number, connection number, and timeslot identity accumulator number for a selected DTDM equipment location.

In test 5 you can:

To View the Test 5 Screen

1. To see the test 5 screen, choose one or both of the following:

   - To start the procedure, enter `p961`

   - If you are already in the procedure, but not in test 5, enter `t5`

     The test 5 screen, similar to the following, appears.

```
              ENHANCED MODE - PROCEDURE: 961, TEST: 5
                        CONNECTION ACTIVITY

2.  Connection Number (octal) : ▢
3.            Busy/idle bit: ▢
4.      Constant table number: ▢
5. In Use: ▢

TIME SLOT IDENTITY
   6.          Module: ▢
   7. Accumulator Number: ▢

8. ACPORT table number: ▢

EQUIPMENT LOCATION
   9.   Module: ▢
  10. Cabinet: ▢
  11. Carrier: ▢
  12.    Slot: ▢
  13. Circuit: ▢

Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▃
[          ][    ][ F3 DATA ][    ][ F5 HELP ][ F6 FIELD ][ F7 INPUT ][ F8 CMDS ]
```

The switch highlights field 9.

Fields 9-13 may contain a default DTDM equipment location from tests 1-4.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To See Connection Information for a DTDM Equipment Location

Use test 5 to help maintain modem pooling.

1. To select a DTDM equipment location enter `cf9` and then enter the module, cabinet, carrier, slot, and circuit.

2. Enter `x` to find information about the DTDM equipment location. The switch searches all acport tables for the DTDM equipment location you selected.

    If the DTDM equipment location is not found field 5 contains a 0 and no more information is available.

    If the DTDM equipment location is found in the acport tables, the following information appears.

    > Field 2 shows the connection number.

    > Field 3 contains a 1 (see Table 7-3).

    > Field 4 shows the constat table number.

    > Field 5 contains a 1 (see Table 7-4).

    > Fields 6 and 7 shows the timeslot identity.

    > Field 8 shows the acport table number.

    > Fields 9-13 show the equipment location you selected.

3. If you want to select another DTDM equipment location repeat steps 1-3.

4. If you want to see connection status activity and you know the connection number, go to test 1.

5. If you want to see connection status activity and you know the timeslot number and accumulator number, go to test 2.

6. If you want to see connection status activity and you know the equipment location, go to test 3.

7. If you want to find the connection number and first active accumulator in a module, go to test 4.

<div style="display: flex; justify-content: space-between;">

TABLE 7-3

TABLE 7-4

</div>

Field 3 Busy/Idle Bit
0   =   idle
1   =   busy

Field 5 In-Use Status
0   =   Idle
1   =   In use

Procedure Fields

The following are data entry fields.

- In test 1, you can select a specific connection number to finds its equipment location, constant table number, acport table number, and timeslot identity in field 2.

- In test 2 you can select a specific timeslot identity to determine the connection number and constat table number in fields 6 and 7.

- In test 3 and 5 you can select a specific equipment location to determine the constat table number, acport table number, connection number and timeslot identity accumulator number in fields 9-13.

- In test 4 you can select a specific module to determine the connection number and the first active accumulator on a module in field 6.

2.	Connection Number	Shows the connection number in octal.
3.	Busy or idle status	Shows the busy or idle status of the connection. Table 7-3 shows the status encodes.
4.	Constat table number	Shows the constat table number.
5.	In use status	Contains a 1 if the circuit is in use. Table 7-4 shows in use status encodes.
6.	Module	Shows the module.
7.	Accumulator Number	Shows the accumulator number in the module in field 6.
8.	Acport table number	Shows which acport table (a software table in the switch) you are viewing.
9-13.	EQUIPMENT LOCATION	Shows the equipment location for the connection on your screen. In test 5 fields 9-13 show the equipment location for the DTDM circuit.
14.	Number of ports in connection	Shows the number of ports that are in the connection on your screen.
15.	Port Index	Shows which port, of the ports in the connection in field 14, you are currently viewing.

PROCEDURE 962 - FACILITY CONNECTIONS

Purpose

Use Procedure 962 to see the trunk number linkages for line records, to see facility and conference facility linkages for trunk records, and to see the progress mark and linkage information for a selected equipment location.

CAUTION
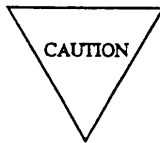
This procedure is for use by authorized personnel only. If you use this procedure you may damage the switch or void the switch warranty.

Tests

Procedure 962 has three tests.

- Use test 1 to do a static test that displays a copy of the connection information for an initiating equipment location.

- Use test 2 to do a dynamic test that continually updates the call progress mark of the initiating equipment location.

- Use test 3 to do a dynamic test that continually updates the call progress mark of the initiating DTDM equipment location.

Procedure Overview

Use Procedure 962 to find the facility connections. In test 1 you are viewing a copy of the connection information for the initiating circuit. When you enter x the data on your screen changes. Test 2 operates the same as test 1 but the data on your screen changes as the call progress mark for the initiating circuit changes. In test 3 the data on your screen changes as the call progress mark for the initiating DTDM circuit changes.

If the initiating circuit is a trunk record, you can view the facilities that are linked. If the initiating circuit is a conference record, you can view the equipment locations on the conference. If you are viewing a multimodule call, you can view the time multiplexed switch (TMS) timeslot number. You can transfer the linked facility or equipment locations on the conference (for example, when you are viewing an intercom record), to the initiating circuit position and then check for any links to the original linked facility.

Test 1- Operation

Use test 1 to do a static test that displays a copy of the connection information for an initiating equipment location.

In test 1 you can:

To View the Test 1 Screen

1. To see the test 1 screen, choose one of the following:

    ● If you are already in the procedure, but not in test 1, enter t1

    ● Otherwise, enter p962

   The test 1 screen, similar to the following, appears.

```
            ENHANCED MODE - PROCEDURE: 962, TEST: 2
                       FACILITY CONNECTIONS

INITIATING  CIRCUIT                    FACILITY OR CONFERENCE PORT
   EQUIPMENT  LOCATION                     EQUIPMENT  LOCATION
      2.   Module: ▢                      11.   Module: ▢
      3. Cabinet: ▢                       12. Cabinet: ▢
      4. Carrier: ▢                       13. Carrier: ▢
      5.    Slot : ▢                      14.    Slot: ▢
      6. Circuit: ▢                       15. Circuit: ▢
    7.       Circuit Type: ▢
    8.             Status: ▢
    9. Call Progress Mark: ▢          16.    How Linked: ▢
                                      17. Circuit Type: ▢
                                      18. Conference  Port  Number: ▢

10. Internal Number Type: ▢




Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▭
[_____][____][ F3 DATA ][____][F5 HELP ][F6 FIELD][F7 INPUT][F8 CMDS]
```

   The switch highlights field 2.

   Fields 2 through 6 may contain a default equipment location from tests 2 or 3.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do a Static Test

1. If you want to select an equipment location, enter `cf2` and then enter the module, cabinet, carrier, slot, and circuit.

2. Enter `x` to see a copy of the connection information for the initiating circuit.

    The initiating circuit and its status appear in fields 2-9. The facility or conference port connected to the initiating circuit appears in fields 11-18. Note that the status information on your screen is not updated until you enter `x`.

    Fields 2-6 show the initiating circuit equipment location.

    Field 7 shows the initiating circuit type (see Table 7-5).

    Field 8 shows the initiating circuit status (see Table 7-6).

    Field 9 shows the call progress mark. For a complete list of call progress marks use the on-line help. The call progress mark is in octal.

    Field 10 may show the internal number type (see Table 7-7) or may be dashed if you are viewing a multimodule call.

    Fields 11-15 may show the facility or conference port equipment location.

    If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.

    Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.

    Field 16 may show how the initiating and facility or conference port are linked (see Table 7-8).

    Field 17 may show the facility or conference port circuit type (see Table 7-5).

    Field 18 may show the conference port number.

3. Enter **nc** to see each linked facility or each equipment location on conference.

> Fields 2-6 show the initiating circuit equipment location.

> Field 7 shows the initiating circuit type (see Table 7-5).

> Field 8 shows the initiating circuit status (see Table 7-6).

> Field 9 shows the call progress mark. The call progress mark is in octal. For a complete list of call progress marks use the on-line help (in the switch support base).

> Field 10 may show the internal number type (see Table 7-7) or may be dashed if you are viewing a multimodule call.

> Fields 11-15 may show the equipment location of the linked facility or the conference port equipment location.

> If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.

> Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.

> Field 16 may show how the initiating and facility or conference port are linked (see Table 7-8).

> Field 17 may show the facility or conference port circuit type (see Table 7-5).

> Field 18 may show the conference port number.

4. If this is not the last linked facility or conference record repeat steps 2-4.

   After you view all facilities or conference records, the switch dashes field 10-18. If you enter **nc** again, the initial display appears.

5. If you want to transfer the facility or conference port equipment location to the initiating circuit equipment location, enter `cdx`

   Note that you cannot transfer a TMS time slot number to the initiating circuit equipment location.

   You can transfer equipment locations, for example when fields 11-15 show an intercom call, to see each facility on the connection.

6. If you transferred equipment locations, enter `x` again to see the new facility or conference port equipment location for the new initiating circuit equipment location.

7. If you want to do a dynamic test, go to test 2.

8. If you want to do a dynamic test that updates the progress mark of the initializing DTDM, go to test 3.

Test 2 - Operation

Use test 2 to do a dynamic test.

In test 2 you can:

To View the Test 2 Screen

1. To see the test 2 screen, choose one or both of the following:

   • To start the procedure, enter `p962`

   • If you are already in the procedure, but not in test 2, enter `t2`

   The test 2 screen, similar to the following, appears.

```
          ENHANCED MODE - PROCEDURE: 962, TEST: 1
                    FACILITY CONNECTIONS

INITIATING CIRCUIT                      FACILITY OR CONFERENCE PORT
  EQUIPMENT LOCATION                        EQUIPMENT LOCATION
     2.  Module: ▢                          11.  Module: ▢
     3. Cabinet: ▢                          12. Cabinet: ▢
     4. Carrier: ▢                          13. Carrier: ▢
     5.   Slot: ▢                           14.   Slot: ▢
     6. Circuit: ▢                          15. Circuit: ▢
  7.     Circuit type: ▢
  8.            Status: ▢
  9. Call Progress Mark: ▢                16.   How Linked: ▢
                                         17. Circuit Type: ▢
                                         18. Conference Port Number: ▢

 10. Internal Number Type: ▢




Connected to CC0 ON-LINE ♡  MAJOR   MINOR   RUN TAPE   BUSY OUT   IN USE   WAIT

enter command: ▭
                     F3 DATA          F5 HELP   F6 FIELD  F7 INPUT  F8 CMDS
```

   The switch highlights field 2.

   Fields 2 through 6 may contain a default equipment location from test 1 or 3.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do a Dynamic Test

In test 2 new connection information appears when progress mark changes.

1. If you want to select an equipment location enter `cf2` and then enter the module, cabinet, carrier, slot, and circuit.

2. Enter `x` to see the connection information for the initiating circuit.

   The initiating circuit and its status appear in fields 2-9. The facility or conference port connected to the initiating circuit appears in fields 11-18. Note that the status information on your screen changes every time the call progress mark (field 9) changes.

   Fields 2-6 show the initiating circuit equipment location.

   Field 7 shows the initiating circuit type (see Table 7-5).

   Field 8 shows the initiating circuit status (see Table 7-6).

   Field 9 shows the call progress mark. All status information on your screen changes when field 9 changes. The call progress mark is in octal. For a complete list of call progress marks use the on-line help (in the switch support base).

   Field 10 may show the internal number type (see Table 7-7) or may be dashed if you are viewing a multimodule call.

   Fields 11-15 may show the equipment location of the linked facility or the conference port equipment location.

   If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.

   Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.

   Field 16 may show how the initiating and facility or conference port are linked (see Table 7-8).

   Field 17 may show the facility or conference port circuit type (see Table 7-5).

   Field 18 may show the conference port number.

3. Enter **nc** to see each linked facility or each equipment location on conference.

    Fields 2-6 show the initiating circuit equipment location.

    Field 7 shows the initiating circuit type (see Table 7-5).

    Field 8 shows the initiating circuit status (see Table 7-6).

    Field 9 shows the call progress mark. The call progress mark is in octal. For a complete list of call progress marks use the on-line help (in the switch support base).

    Field 10 may show the internal number type (see Table 7-7) or may be dashed if you are viewing a multimodule call.

    Fields 11-15 may show the equipment location of the linked facility or the conference port equipment location.

    If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.

    Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.

    Field 16 may show how the initiating and facility or conference port are linked (see Table 7-8).

    Field 17 may show the facility or conference port circuit type (see Table 7-5).

    Field 18 may show the conference port number.

4. If this is not the last linked facility or conference record, repeat steps 2-4.

    After you view all facilities or conference records, the switch dashes field 10 through 18. If you enter nc again, the initial display appears.

5. If you want to transfer the facility or conference port equipment location to the initiating circuit equipment locaiton, enter **cdx**

    Note that you cannot transfer a TMS time slot number to the initiating circuit equipment location.

    You can transfer equipment locations, for example, when fields 11-15 show an intercom call, to see each facility on the connection.

6. If you transferred equipment locations, enter x again to see the new facility or conference port equipment location for the new initiating circuit equipment location.

7. If you want to do a static test, go to test 1.

8. If you want to do a dynamic test that updates the progress mark of the initializing DTDM, go to test 3.

Test 3 - Operation

Use test 3 to do a dynamic test that continually updates the call progress mark of the initiating DTDM equipment location.

In test 3 you can:

To View the Test 3 Screen

1. To see the test 3 screen, choose one or both of the following:

   - To start the procedure, enter `p962`

   - If you are already in the procedure, but not in test 3, enter `t3`

   The test 3 screen, similar to the following, appears.

```
                 ENHANCED MODE - PROCEDURE: 962, TEST: 3
                           FACILITY CONNECTIONS


  INITIATING CIRCUIT                    FACILITY OR CONFERENCE PORT
    EQUIPMENT LOCATION                     EQUIPMENT LOCATION
      2.  Module: ▢                       11.  Module: ▢
      3. Cabinet: ▢                       12. Cabinet: ▢
      4. Carrier: ▢                       13. Carrier: ▢
      5.    Slot: ▢                       14.    Slot: ▢
      6. Circuit: ▢                       15. Circuit: ▢
     7.      Circuit Type: ▢
     8.            Status: ▢
     9. Call Progress Mark: ▢             16. How Linked: ▢
                                          17. Circuit Type: ▢
                                          18. Conference Port Number: ▢

  10. Internal Number Type: ▢




  Connected to CC0 ON-LINE ♡ ┌ MAJOR ┐┌ MINOR ┐┌ RUN TAPE ┐┌ BUSY OUT ┐┌ IN USE ┐┌ WAIT ┐

  enter command: ▬
  ┌──────┐┌──────┐┌ F3 DATA ┐┌─────┐┌ F5 HELP ┐┌ F6 FIELD ┐┌ F7 INPUT ┐┌ F8 CMDS ┐
```

   The switch highlights field 2.

   Fields 2 through 6 may contain a default equipment location from test 1 or 2.

To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Do a Dynamic Test of DTDM Circuits

In test 3 new connection information appears when progress mark changes.

Note that a facility or conference port equipment location (Fields 11 through 15) cannot be transferred to the initiating DTDM circuit equipment location.

1. If you want to select a DTDM equipment location enter `cf2` and then enter the module, cabinet, carrier, slot, and circuit.

2. Enter `x` to see the connection information for the initiating DTDM circuit.

   The initiating DTDM circuit and its status appear in fields 2-9. The facility or conference port connected to the initiating circuit appears in fields 11-18. Note that the status information on your screen changes every time the call progress mark (field 9) changes.

   Fields 2-6 show the initiating DTDM circuit equipment location.

   Field 7 shows the initiating circuit type (see Table 7-5).

   Field 8 shows the initiating circuit status (see Table 7-6).

   Field 9 shows the call progress mark. For a complete list of call progress marks use the on-line help. The call progress mark is in octal. All status information on your screen changes when field 9 changes.

   Field 10 may show the internal number type (see Table 7-7) or may be dashed if you are viewing a multimodule call.

   Fields 11-15 may show the equipment location of the linked facility or the conference port equipment location.

   If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.

   Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.

   Field 16 may show how the initiating and facility or conference port are linked (see Table 7-8).

   Field 17 may show the facility or conference port circuit type (see Table 7-5).

   Field 18 may show the conference port number.

3. If you want to do a static test, go to test 1.

4. If you want to do a dynamic test, go to test 2.

TABLE 7-5

Fields 7 and 17 Circuit Type	
0	= Unequipped
1	= Terminal
2	= Trunk
3	= 72 Series terminal or DTDM
4	= TMS
5	= Pseudo trunk

TABLE 7-6

Field 8 Status	
0	= Non-control, non conference
1	= In-control, non-conference
2	= Non-control, in conference
3	= In control, in conference
4	= Not on time slot
5	= Invalid location
6	= Maintenance busy
7	= Unequipped circuit

TABLE 7-7

Field 10 Internal Number Type	
1	= Equipment location in fields 11-15
2	= Queuing trunk
3	= ICOM octal record number in fields 11-15
4	= Attendant switch loop octal record number in fields 11-15
5	= Attendant originating register
6	= Dial pulse originating register

TABLE 7-8

Field 16 How Linked	
1	= Trunk-facility 1
2	= Trunk-facility 2
3	= Trunk-facility 3
4	= Terminal
5	= Not used
6	= Terminal-conference CFAC1-8

Procedure Fields

● You can select an equipment location in fields 2 through 6.

The meaning of the fields are:

2.	INITIATING CIRCUIT EQUIPMENT LOCATION	Shows the initiating circuit equipment location.
7.	Circuit type	Shows the type of circuit in fields 2-6. Table 7-5 shows the circuit type encodes.
8.	Status	Shows the status of the trunk record, conference record, or DTDM circuit in fields 2-6. Table 7-6 shows the status encodes.
9.	Call Progress Mark	Shows the call progress mark as the call progresses. The call progress marks are on-line (contained in the switch support base). The call progress marks are in octal.
10.	Internal Number Type	Table 7-7 shows the internal number type.
11-15.	FACILITY OR CONFERENCE PORT EQUIPMENT LOCATION	If the initiating circuit in fields 2-6 is a trunk record, fields 11-15 show the equipment location of the linked facility.
		If the initiating circuit in fields 2-6 is a conference record, fields 11-15 show the equipment location of each port on the conference.
		If you are viewing an ICOM record or an attendant switch loop, fields 11-15 show the ICOM or attendant switch loop record number (in octal). Read fields 11-15 as one field to interpret the octal number.
		Fields 11-12 and 15 are dashed if a multimodule call is made. Fields 13 and 14 show a TMS time slot number if a multimodule call has been made. In this case, read fields 13 and 14 as one field to get the TMS time slot number.
16.	How Linked	Shows how the initiating circuit and the facility or conference port are linked. Table 7-8 shows the encodes for field 16.
17.	Circuit Type	Shows the type of circuit in fields 11-15. Table 7-5 shows the circuit type encodes.
18.	Conference Port Number	Shows the number of the conference port on a conference call.

8. OTHER PROCEDURES

This chapter contains other procedures. Procedure 999, included to help fix memory problems, shows the data contents of a memory address through the software tables.

PROCEDURE 999 - MEMORY WORD DISPLAY

Purpose

Use Procedure 999 to access and display the word contents of memory from the software tables. You cannot change the contents of a memory address.
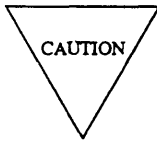
⚠ CAUTION   This procedure is for use by authorized personnel only. If you use this procedure you may damage the switch or void the switch warranty.

Tests

Procedure 999 has one test.

- Use test 1 to examine the contents of a memory address.

Procedure Overview

Procedure 999 shows you the octal contents of a selected memory address.

To use Procedure 999 it is helpful to have a calculator to convert octal numbers to hexadecimal binary, and decimal.

Test 1 - Operation

Use test 1 to examine the contents of a memory address.

In test 1 you can:

View the test 1 screen

Examine the contents of a memory address

To View the Test 1 Screen

1. To see the test 1 screen, enter p999

   The test 1 screen, similar to the following, appears.

```
                        ENHANCED MODE - PROCEDURE : 999
                            EXAMINE MEMORY CONTENTS

   1.   Memory  Address: [_____]
   3. Memory Word Contents: [_____]
```

```
Connected to CC0 ON-LINE ♡ [ MAJOR ][ MINOR ][ RUN TAPE ][ BUSY OUT ][ IN USE ][ WAIT ]

enter command: ▄
[_____][_____][F3 DATA ][_____][F5 HELP ][F6 FIELD ][F7 INPUT ][F8 CMDS ]
```

   To find the meaning of any field on your screen, go to *Procedure Fields* at the end of this procedure.

To Examine the Contents of a Memory Address

1. Enter dsp

   The switch dashes the address fields on your screen.

2. To select a memory address, enter the address (in octal) of the word whose contents you want to examine.

3. Enter ; to see the contents of the memory word you selected.

   Field 1 shows the data address (in octal).

   Field 2 shows the data in the address. If the data word has bad parity, field 2 contains a 999999.

4. Enter nd to see the memory contents of the next address.

   Field 1 shows the data address. The number in field 1 increases by one (octal).

   Field 2 shows the data in the address. If the data word has bad parity, field 2 contains a 999999.

5. If you want to step through a range repeat steps 4 and 5.

6. If you want to see the contents of another memory address repeat steps 2-6.

Procedure Fields

You can enter data in the following fields.

You can enter an octal memory address in field 1 (in octal) to see the data contents of the memory address.

The meaning of the fields are:

| 1. | Memory Address | Shows the memory address (in octal) of a memory location. The maximum addressable memory location is 16M (based on the current switch memory configuration).   16M equals 177777777 octal FFFFFF hexadecimal). |
| 3. | Memory Word Contents | Shows the contents of the memory address in field 1. The data is in octal. |

GLOSSARY

9-track tape drive   A tape drive with nine tracks used to record call detail recording (CDR) information on magnetic tape.

access code   A 1-, 2-, 3- or 4-digit dial code used to activate or cancel a feature or access an outgoing trunk. Star (*) or pound (#) can be used as the first digit of an access code.

access security   The capability of a PBX to grant or deny access to facilities or services, including network access, based on a unique personal identifier, such as speaker verification.

account code   A dialed code used with call detail recording that allows a call to be charged to a specific department's or project's account.

adjunct   A device that does one or more tasks for another device. For example, a 3B2 computer dedicated to logging and processing call detail records received from a PBX is serving as an adjunct to the PBX.

administer   To establish or change the characteristics of a system.

alarm   An indication that a failure has occurred. The three levels of alarms are: major, minor, and warning.

analog   The representation of information by means of continuously variable physical quantities such as amplitude, frequency, phase, or resistance. See also *digital.*

analog voice terminal   A telephone that receives acoustic voice signals and sends analog electrical signals along the line. Analog voice terminals are served by a single wire pair (tip and ring). The AT&T Model 2500 telephone set is a typical example of an analog voice terminal.

architecture   The organizational structure of a system, including hardware and/or software.

asynchronous data transmission   A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. See also *synchronous data transmission.*

asynchronous data unit (ADU)   A data communications equipment (DCE) device that allows direct connection between RS-232C equipment and a PBX.

asynchronous transmission	See *asynchronous data transmission.*
AT&T ISDN basic rate interface (ISDN BRI)	An AT&T corporate specification that describes the level-l, 2, and 3 interfaces for BRIs on AT&T products. See also *AT&T ISDN primary rate interface (PRI).*
AT&T ISDN primary rate interface (ISDN PRI)	An AT&T corporate specification that describes level-l, 2, and 3 interfaces for primary rate interfaces (PRIs) on AT&T products. See also *AT&T ISDN basic rate interface (BRI).*
attendant	A person at a console on a customer's premises who provides personalized service for incoming callers and voice-services users by performing switching and signaling operations.
attendant console	The workstation used by an attendant. The attendant console allows the attendant to originate a call, answer an incoming call, transfer a call to another extension or trunk, put a call on hold, and remove a call from hold. Attendants using the console can also manage and monitor some system operations.
attenuation	A decrease in amplitude of a sinusoidal wave as it traverses a transmission line.
audible alerting tone	See *ringback tone.*
Automatic Number Identification (ANI)	The process of automatically identifying a calling party's telephone number and transmitting that number from the caller's local central office (CO) to another point on or off the public network. The term *"ANI" is* sometimes used for the calling number itself as well as for the process of identifying and transmitting it.
auxiliary trunk	A trunk used to connect auxiliary equipment, such as radio paging equipment, to a PBX.
B-channel	For an Integrated Services Digital Network (ISDN), a 64-Kbps channel, accompanied by timing, intended to carry a wide variety of digital information streams (such as voice at 64 Kbps data at less than or equal to 64 Kbps, wideband voice encoded at 64 Kbps, and voice at less than 64 Kbps) alone or combined with other digital information streams. See also *D-channel.*
basic rate interface (BRI)	A standard ISDN frame format. A BRI runs at a speed of 192 Kbps and supports two 64-Kbps voice or data B-channels and one 16-Kbps signaling and data D-channel per port. The remaining 48 Kbps are used for framing and D-channel contention.
baud	A unit of transmission speed equal to the number of signal events per second.

binary-coded decimal (BCD)   Either of two standard codes for the representation of characters. A standard 4-bit code permits the representation of decimal numbers, with each decimal digit represented by a 4-digit binary number.

bit (binary digit)   One unit of information in binary notation (having two possible states or values: 0 or 1).

bit rate   See *data rate.*

bits per second (bps)   The number of units of information in binary notation that is transmitted or received per second.

buffer   A circuit or component that isolates 1 electrical circuit from another. Typically, a buffer holds data from 1 circuit or process until another circuit or process is ready to accept the data. In software, a buffer is an area of memory used for temporary storage.

bus   A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

busy out   The removal of a maintenance object (MO) from sevice. The MO is out of service until it is released; this prevents cdl-processing software from using the busied-out resource.

byte   A sequence of bits, usually consisting of eight bits processed together.

cabinet   Housing for racks, shelves, or carriers that contain electronic equipment.

cable   1. The physical connection between two pieces of equipment (for example, cable from a data terminal to a modem) or between a piece of equipment and a termination field (for example, circuit pack input/output (I/O) cables). A cable is usually made of metal conductors with plastic insulation. Lightwave fibers can be considered cables but are usually called fibers.

2. To connect two devices or a device and a termination field.

cable connector   The connector on the end of a cable. A cable connector provides a means of connecting wires on a cable to specific data or power leads on data equipment. A cable connector is either a cable jack (female) or a cable plug (male).

call detail recording (CDR)   A service that records detailed call information for incoming and outgoing calls and associates these calls with account codes.

Call Detail Recording Utility (CDRU)	Applications software running on an AT&T 3B2/300, 3B2/310, or 3B2/400 processor to collect, store, optionally filter, and output call-detail records for direct or polled output to Call Accounting Systems (CASs) or other peripheral devices.
Call Accounting System (CAS)	A processor-based PBX adjunct that records call-detail records transmitted from a PBX and process that data to provide information for managing voice terminal usage and control expenditures. With some adjuncts (for example, Centralized System Management (CSM), applications processors (APs), and customer host computers), CAS is coresident with other applications. Others (for example, AT&T CAS Teleseer®) are special-purpose adjuncts dedicated to processing and reporting call-detail records.
call-progress tone	One of a set of tones (for example, ringback tone, busy tone, or reorder tone) that a caller can receive from a PBX to indicate the status of a call or the facilities used by the call.
carrier	Amounting rack for plug-in circuit cards.
central office (CO) call	A call routed directly through the public network.
central office (CO) trunk	A telecommunications channel that provides access from a PBX to the public network through the local CO.
centralized attendant service (CAS)	A service that enables the attendants for a private network to be centralized on one of the PBXs in the network. The attended PBX is called a *CAS main,* and each unattended PBX is called a CAS *branch.*
channel	A communications path for transmitting voice and/or data
circuit	1. An arrangement of electrical elements through which electric current flows.
	2. A channel or communications path between two or more points.
clock bus	A conductor or group of conductors carrying clock signals.
connection	The means by which a signal can travel from one circuit to another.
connectivity	The connection of disparate devices within a single system.
console	See *attendant console.*
control-channel bus	The time-division-multiplexed (TDM) bus carrying control-channel messages.

cursor	The visual indicator on a terminal screen that marks the user's location. A cursor is often used to indicate the position at which a character can be entered or deleted. More than one cursor may be present on some terminal screens.
D-channel	The 16- or 64-Kbps packet-switched channel on a basic rate interface (BRI) or primary rate interface (PRI) that carries signaling messages and packet-switched user data. A D-channel is the ISDN PRI Q.931 signaling channel. (AD-channel can also carry data, but this capability is not used on an AT&T DEFINITY™ Communications System Generic 2.)
data channel	The means of transmission for and the intervening equipment used in the transfer of information in a given direction.
data-communications interface unit (DCIU)	An interface between the AT&T System 85 main processor and application processors (APs), Audio Information Exchange (AUDIX) equipment, or, in a distributed communications system (DCS) configuration, other PBXs.
data link	The configuration of physical facilities enabling end terminals to communicate directly with each other.
data rate	The transmission of data measured in bits per second (bps).
data terminal	An input/output device that has either switched or direct access to a host computer or to an applications processor (AP). The AT&T data terminals include: the AT&T Personal Terminal 510D, and the models 500,513, and 515 Business Communications Terminal (BCT).
DCIU link	A hardware communications link that connects two data-communications interface units (DCIUs).
DCIU port	A gateway to or from an application such as a Distributed Communications System (DCS). The data-commununications interface unit (DCIU) ports are the endpoints of a virtual circuit and look like an input/output device to the application.
Dedicated Switch Connection (DSC)	A feature that functions as a hardwired link between two ports on a PBX, providing a full-time line between the assigned endpoints. Once administered, the connection remains intact until removed
default	A value assigned automatically by system software when a user chooses not to assign a value. The user has the option of accepting or changing the default.
digital	The representation of information in discrete elements such as off and on or 0 and 1. See also *Analog*.

Digital Communication Protocol (DCP)	An AT&T proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two information channels and one signaling channel.
digital facility	A switching or transmission facility specifically designed to handle digital signals.
digital telephone	See *digital voice terminal.*
digital terminal data module (DTDM)	An integrated or adjunct data module that shares with a digital voice terminal the same physical port for connection to a PBX. The function of a DTDM is similar to that of a processor data module (PDM) and modular processor data module (MPDM) in that it converts RS-232C signals to Digital Communications Protocol (DCP) signals.
digital transmission	A mode of transmission in which the information to be transmitted is first converted to digital form and then transmitted as a serial stream of pulses.
digital trunk	A dedicated telecommunications channel on which information (such as voice and data) is transmitted and/or received in digital form only.
digital voice terminal	A voice terminal that converts analog voice signals into digital electrical signals to be sent along the voice terminal line. Digital voice terminals use Digital Communications Protocol (DCP) and are served by two pairs of wire. DCP voice terminals include: models 7402D, 7403D, 7404D, 7405D, 7406D, 7407D, 510D, and the 515 Business Communications Terminal (BCT).
digital-to-analog converter (DAC)	A device that converts data in digital form to the corresponding analog signals.
disk	A magnetic platter coated with magnetic material and used as a storage medium.
disk drive	A mechanical device that stores data on and retrieves data from one or more disks. See also *disks.*
disk tape system assembly (DTSA)	A disk-based mass-storage unit that physically houses the disk drive, the tape drive, and the DC-to-DC power converter for powering the drives. It replaces the high-capacity minirecorder (HCMR) and reduces system reload time.
duplication	The use of redundant components to improve availability. When a duplicated subsystem fails, its backup redundant subsystem automatically takes over.
equipment location	A designed position (address) of a line or a trunk in the PBX hardware.

error	A single occurrence of either an incorrect event during normal system service or an incorrect response to a test stimulus during initialization, background testing, or demand testing. An error can be detected by firmware or software tests and is the result of a fault, a software bug, or noise.
error-free second	Any second in which no bit errors are received. An error-free second is used as a measure of performance for digital signal level-l (DSl) service.
errored second	A second in which at least one bit error occurs.
extension number	A 1- to 5-digit number by which calls are routed through a PBX or, with a Uniform Dialing Plan (UDP), through a private network. Extension numbers are primarily associated with voice and/or data terminals but can also be used for functions associated with specific features.
facility	A telecommunications transmission pathway and associated equipment. See also *trunk, line.*
facility-associated signaling	Signaling in which a D-channel carries the signaling only for those channels on the same physical interface.
failure	The condition in which the number of detected errors exceeds a predetermined threshold. When a failure occurs, an alarm signals that the threshold has been exceeded; the level of the alarm shows the effect of the failure on the quality of service.
far end	The end of a data path. See also *near end.*
fault	A physical defect in a hardware component of a system that causes improper circuit operation. Some faults are considered intermittent because they occur with no predictable or regular frequency. Others are considered solid because they occur in a regular pattern.
field	A category of information in a record or database. A field typically has two parts: field name, which identifies a predefine category of information (such as *supv* for supervisor), and field value, which contains specific information about that category (such as *Smith J).* A field can also be an area on a terminal screen that shows information or requires users to enter information.
Force Administration Data System (FADS)	A method of collecting and storing traffic-related information for Centralized Attendant Service (CAS) and/or for some types of Call Management System (CMS) splits. For the CMS applications FADS has largely been replaced by the management information system (MIS).

frame	One of several segments of an analog or digital signal that has a repetitive characteristic.
full duplex	A transmission system capable of carrying signals in both directions simultaneously.
ground-start signaling on a trunk	A method by which, on outgoing calls, a PBX transmits a request for services to a distant PBX by grounding the trunk's ring lead. When the distant PBX is ready to receive the digits of the called number, that PBX grounds the trunk's tip lead. When the first PBX detects this ground, the digits are sent. On incoming calls, detection of ground on the trunk's ring lead is sufficient to cause the call to route to a predetermined destination, normally the system attendant group. No digits are received.
glare	The simultaneous seizure of a 2-way trunk.
half-duplex transmission	Transmission in both directions but in only one direction at a time.
handset	The handheld part of a voice terminal that you pick up, talk into, and listen from.
handshaking	A process, that occurs after successful call setup but before, actual data transmission, between 2 data devices to ascertain whether their data transmission parameters are set to permit successful data transmission.
hard disk	See *disk.*
hertz (Hz)	A unit of frequency equal to one cycle per second.
Integrated Services Digital Network (ISDN)	A public or private network that provides end-to-end digital connectivity to support a wide variety of services, including voice and nonvoice service to which users have access by a limited set of CCITT-defined standard multipurpose user-network interfaces. Such a network, through internationally accepted standard interfaces, provides circuit-switched or packet-switched connectivity within the network and links to other ISDNs to provide national and international digital connectivity. Users have access to this larger network through a limited set of standard multipurpose customer interfaces.
intercept tone	An alternating high- and low- frequency tone that indicates a dialing error or denial of the service requested.
interface	A common boundary between two systems or pieces of equipment.
ISDN terminal	The endpoint in the system capable of supporting a call using either the basic rate interface (BRI) or primary rate interface (PRI) Integrated Services Digital Network (ISDN) signaling. An ISDN terminal can be a digital multiplexed interface message-oriented signaling (DMI-MOS) interface, an AT&T public ISDN interface, or a 5ESS® PRI.

layer	See *level.*
level	The basis of the structure of the Open Systems Interconnection (OSI) network model, which consists of a series of levels used in communication.
LED (light-emitting diode)	A semiconductor device that produces light when voltage is applied. LEDs provide a visual indication of the operational status for hardware components, the results of maintenance tests (for example, in use, pass, fail), and the alarm status of circuit packs.
line	A communication link between a customer's PBX or central office (CO) switching system and a voice terminal or other terminal.
link access procedure on the D-channel (LAPD)	A link-layer protocol on the Integrated Services Digital Network (ISDN) basic rate interface (BRI) and primary rate interface (PRI) data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D) channel and for mode 3 data communications on a bearer (B) channel.
local	Pertaining to, or within, the physical limits of the serving PBX.
local area network (LAN)	A networking arrangement specifically designed to support a limited geographical area. Generally, a LAN is limited in range to a maximum of 6.2 miles and provides high-speed carrier service with low error rates. Common configurations include: daisy chain, star (including circuit switched), ring, and bus.
local area network (LAN) bus	A high-bandwidth bus that transmits packets at a rate of 40 Mbps.
logical channel (or circuit)	A message slot on a digital communications link. A logical channel is one of the logically independent elements of a data stream that is multiplexed onto a single communications carrier.
logical D-channel	The portion of a physical D-channel used to carry signaling for one Integrated Services Digital Network (ISDN) endpoint.
maintenance	The activities involved in keeping a telecommunications system in proper working condition: the detection and isolation of software and hardware faults and automatic and manual recovery from these faults.
maintenance tests	Tests that detect and diagnose system problems. Each maintenance test consists of a sequence of stimuli applied to a circuit or a software function. The system response to the test is compared with the expected results. Maintenance tests can be demand test, destructive tests, nondestructive tests, periodic tests, scheduled tests, initialization tests, and audits.

major alarm	An indication of a failure that has caused critical degradation of service and requires immediate attention. Major alarms are automatically displayed on light emitting diodes (LEDs) located on the attendant console and maintenance or alarming circuit card, logged to the alarm log, and reported to a remote maintenance facility (if applicable).
management information message (MIM)	The level-3 messages that convey management and maintenance information between a PBX and a basic rate interface (BRI) terminal.
modem	A device that converts digital data signals to analog signals for transmission over voice-terminal circuits. The analog signals are converted back to the original digital data signals by another modern at the other end of the circuit. Also called a *data set.*
modem pooling	A capability that provides shared conversion resources (moderns and data modules) for cost-effective access to analog facilities by data terminals. When needed, modem pooling inserts a conversion resource into the path of a data call. Modem pooling serves both outgoing and incoming calls.
network	A series of points, nodes, or stations connected by communications channels.
Network Control Operations Support System (NCOSS)	An AT&T service that requires the use of buffered call-detail records data collection with a local storage unit (LSU), such as the 94A LSU or 3B2 Call Detail Recording Utility (CDRU).
network processing element (NPE)	A distributed time-slot interchanger (TSI) that controls time slot assignment, gain adjustment, port connectivity, and port conferencing for circuit-switched connections.
nonfacility associated signaling (NFAS)	A method that allows multiple T1 links to share a single D-channel on one of the spans. One T1 link is therefore configured as 23 B-channels plus one D-channel, while the other spans that share the D-channel are configured with the B-channels.
nondestructive test	A maintenance test, executed on a maintenance object (MO), that does not interrupt service.
periodic maintenance information data structure (PMIDS)	A storage area that counts errors found in a system during processing.
physical location	The address (cabinet number, carrier number, slot number, and circuit number) of a cabinet, carrier, slot, or circuit.
port	The data or voice transmission "outlet" on a device used for communicating with other devices.
port carrier	A carrier containing port circuit cards and power units.

port tester	A portable tool that isolates problems to a voice teminal, port circuit card, or wiring between them.
primary rate interface (PRI)	A standard Integrated Services Digital Network (ISDN) frame format recommended by the CCITT.
protocol	A set of conventions governing the format and timing of message exchanges that control data movement and error correction.
queue	An ordered sequence of items (for example, outgoing trunk calls, incoming Call Management System (CMS) calls, or CMS agent positions) waiting to be processed.
queuing	The process of holding calls in order of their arrival to await connection to an attendant, answering group, or idle trunk. Calls are automatically connected, unless priority queuing is provided, in first-in, first-out (FIFO) sequence.
random-access memory (RAM)	Computer memory whose contents can be changed at any time.
read-only memory (ROM)	Computer memory that can be read repeatedly but cannot be changed.
read operation	The process of retrieving information from memory.
Remote Carrier Group	A feature that helps locate a port carrier up to 100 miles from a PBX over digital services level-l (DS1) facilities.
reorder tone	A fast-busy tone indicating that at least one of the facilities, such as a trunk or a digit transmitter, required for a call was not available when the call was placed.
ringback tone	The audible signal heard at the calling voice terminal to indicate that the called party is being rung. In some contexts, ringback tone does not mean that the called party is receiving an audible signal.
RS232C	A physical interface specified by the Electronic Industries Association (EIA). RS-232C transmits and receives asynchronous data at speeds up to 19.2 Kbps over cable distances up to 50 feet.
serial data transmission	An operation where data is transmitted or processed one bit after the other.
signaling	The sending of control and status information between devices to set up or take down a connection.
slot	A track in a carrier used to guide the plug end of a circuit card to the pins on the carrier backplane. The slot number is used as part of a circuit card's address.

small computer system interface (SCSI)	An American National Standards Institute (ANSI) bus standard that provides a high-level command interface between host computers and peripheral devices.
small computer system interface (SCSI) controller	The entities on the SCSI bus other than the host adapters (HAs). The six controller types are direct-access (hard disk), sequential access (tape), printer, processor, write-once read-multiple (optical disk), and read-only direct-access (optical disk).
soft switch	A planned transfer of system control from one processor to another without affecting service.
Station Message Detail Recording (SMDR)	A specific call-detail recording capabilty consisting of a PBX adjunct that provides buffering plus either a 9-track tape image of call-detail records or a direct output of records suitable for printing.
status indicator	See *status light.*
status information	Information defining the current state of call processing within a PBX.
status light	An indicator light showing the status of an appearance by the state of the light (lighted, flashing, fluttering, or dark).
switch administrator	A person responsible for specifying features and/or services available to users of the PBX.
synchronization	The process in which proper phase alignment to a transmitter is made so that the beginning and end of a character, message, time slot, or frame can be readily identified for information retrieval.
synchronous data transmission	A mode of digital transmission in which discrete signal elements are transmitted at a fixed and continuous rate. Synchronous data transmission requires sending and receiving devices to operate in step with each other. See also *asynchronous data transmission.*
tie trunk	A dedicated telecommunications channel connecting two PBXs.
time-division multiplexing (TDM)	Multiplexing that divides a transmission channel into successive time slots.
traditional module	A module control cabinet and up to three port cabinets that function as a single switching module.
traffic	The flow of voice and data communications through a PBX.
translations	Specific information assigned to a voice terminal or to the system and customized for the user.
trunk	A dedicated telecommunications channel.

trunk group	Telecommunications channels assigned as a group for certain functions.
trunk port	The hardware providing the access point to the PBX for each circuit associated with a trunk.
universal bus interface	A control-complex circuit card for universal modules that interfaces the module processor to the cabinet bus, LAN bus, and clock bus.
universal module	A single-cabinet replacement for a traditional AT&T System 85 R2 call-processing module using high-circuit density technology to provide more circuitry in less space, usually at lower cost. The universal module architecture is a combination of AT&T System 85 and AT&T System 75 architectures that uses a modified module control complex that allows System 75 port circuit cards to be used on System 85.
universal module control cabinet	A common cabinet configured with a universal module control complex, common port network (PN), and power.
universal module control carrier	The AT&T System 85 module that consists of DEFINITY™ Communications System port technology and design, DEFINITY™ Communications System intramodule network fabric, and a modified System 85 R2V4 module control carrier.
universal module processor	A module processor that is capable of supporting the cost-reduced port hardware common between AT&T DEFINITY™ Communications System Generic 1 and 2.
virtual card	One of the three electrical circuit card locations to which a circuit card located on the universal module maps.
virtual call	A call made without a B-channel.
virtual circuit	The entire path between two end processors. A virtual circuit can consist of more than one communications link and is also used in packet switching. In the data-communications interface unit (DCIU) application, the terms dirts *path* or *control path* are used instead of *virtual circuit.*
virtual equipment location	The AT&T System 85 R2 electrical equipment location referenced by an equipment location on the universal module.
voice service	The switching and transmission of voice frequencies.
warning alarm	An indication of a failure that has caused minimal degradation of service. Warning alarms are displayed on the maintenance circuit card's light-emitting diode (LED) and logged to the alarm log. Typically, a warning alarm affects only one user (for example, only one extension or voice terminal).

WATS trunk	A one-way outgoing telecommunications channel used to place a Wide Area Telecommunications Service (WATS) call, or a one-way incoming telecommunication channel used to receive an 800-service call.
Wide Area Telecommunications Service (WATS)	A service that allows calls to a certain area or areas for a flat-rate charge based on expected usage.
wink-start tie trunk	A tie trunk on which after establishing a connection with a distant PBX for an outgoing call, the system waits for a momentary signal (wink) before sending the digits of the called number. Similarly, on an incoming call, the system sends the wink signal when ready to receive digits.
write operation	The process of putting information into memory.

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