# Critical Release Notice

**Publication number: 662-7001-300**
**Publication release: Standard 02.04**

The content of this customer NTP supports the SN06 (DMS) and ISN06 (TDM) software releases.

Bookmarks used in this NTP highlight the changes between the baseline NTP and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the baseline NTP remains unchanged and is valid for the current release.

## Bookmark Color Legend

**Black: Applies to new or modified content for the baseline NTP that is valid through the current release.**

**Red: Applies to new or modified content for NA017/ISN04 (TDM) that is valid through the current release.**

**Blue: Applies to new or modified content for NA018 (SN05 DMS)/ISN05 (TDM) that is valid through the current release.**

**Green: Applies to new or modified content for SN06 (DMS)/ISN06 (TDM) that is valid through the current release.**

***Attention!***
*Adobe® Acrobat® Reader™ 5.0 is required to view bookmarks in color.*

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**662-7001-300**

Network Test Systems

# Digital Test Head

## Operations

Standard 02.03 January 2000

NORTEL NETWORKS™

*How the world shares ideas.*

Network Test Systems

# Digital Test Head

## Operations

Document number: 662-7001-300
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# Publication history

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Made editorial changes. In response to CSR UT80788, there is a new DTH feature that permits the DTH to accept up to 15 digit long signal string.

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**June1992**

First preliminary issue of Release 33 documentation.

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First preliminary issue of Release 32 documentation.

**November 1991**

First draft issue of Release 32 documentation.

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# About this document

This document describes the Digital Test Head (DTH). It is a circuit-testing device you can use throughout a network. It can perform tests with other DTHs as well as by itself through a loopback. It can support multiple tests concurrently.

A DTH accepts test instructions, performs tests, and displays test results. The DTH administrator or tester access it from a local terminal. You can also access through a network operations protocol (NOP) interface.

### Using this NTP

This NTP explains how to use the DTH for trunk testing. It provides step-by-step instructions for all the functions that can be performed by a local-terminal user or administrator. It is arranged by function for quick access to each procedure.

### Associated NTPs

For a detailed discussion of the DTH, and the tests it can perform, refer to 662 - 7001-100. 662-7001-200, shows how to install and maintain the DTH.

## Troubleshooting message list

There is a list of DTH messages, their possible cause, and recommended solution at the end of this document.

# General

This chapter explains the basic information you need to get started with the DTH. It describes the terminal screen and keyboard, and explains how to log on and log off. It also provides an overview of the DTH local terminal user interface.

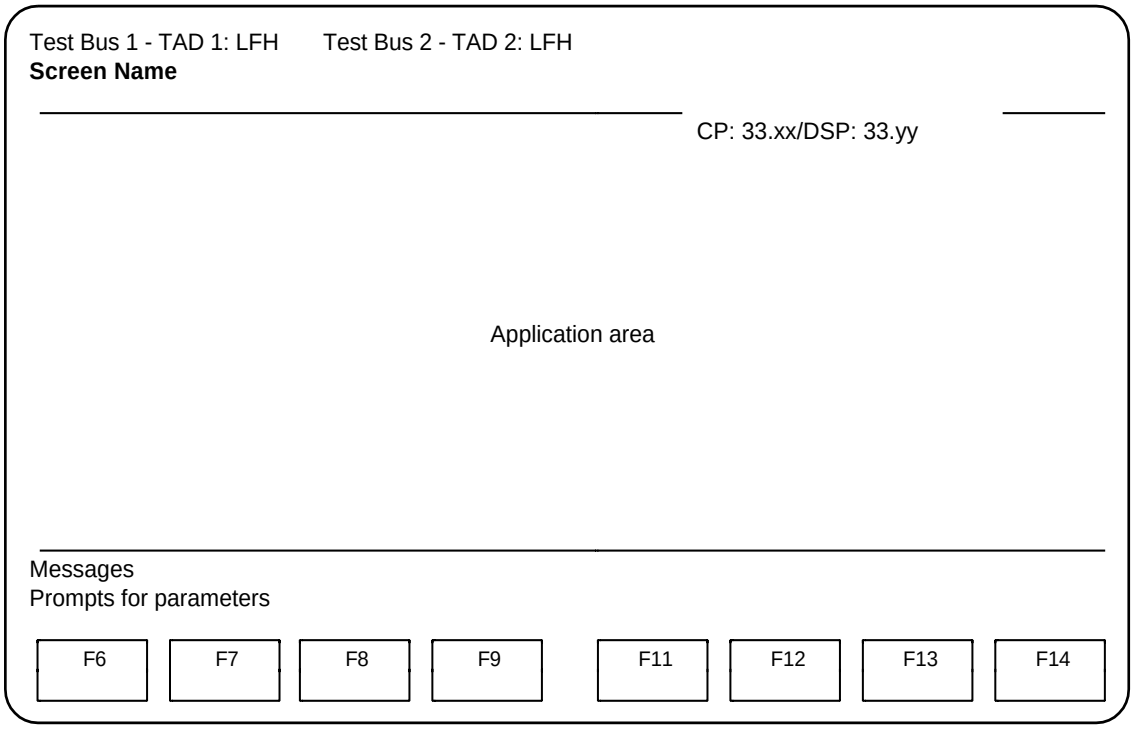
The document’s contents are:

- Introduction - provides an overview of the system and explains how to use the DTH's local terminal user interface.
- DTH user options - gives step-by-step instructions on the testing functions that the DTH tester can perform.
- List of terms - defines abbreviations and other terms used in this NTP.

## Using the local terminal

You can communicate with the DTH using the local terminal, which is a VT220 or VT220-compatible terminal. Figure 1-1illustrates the local terminal VT220 display layout.

**Figure 1-1**
**VT220 display layout**




## Terminal screen

The screen has a number of areas. The application area, in the middle of the screen, displays DTH menus, lists, and forms. The areas on the display are:

- Line 1 displays test bus status.
- Line 2 shows the screen name.
- Line 3 shows the release number.
- Lines 4 through 19 display DTH menus, lists, and forms (the application area).
- Lines 20, 21, and 22 display DTH messages and prompts that request parameters for tests. (Some tests have separate parameter-entry screens.)
- Lines 23 and 24 display softkey icons. The icons show the current softkey functions. Each icon represents a softkey, which corresponds to a pre-programmed function key.

## Test bus status display

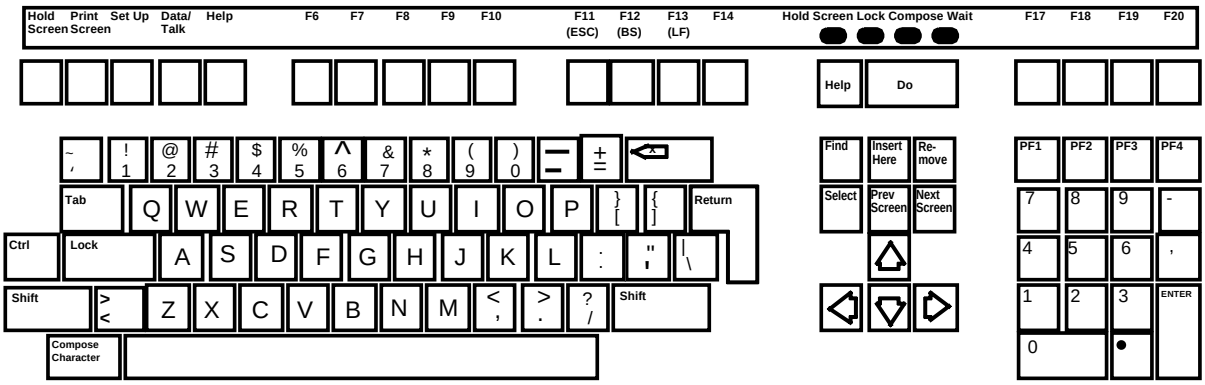
If you are using the DTH as a ROTL, the test bus 1 status display is VF I/F. The DTH shows the appropriate test access digroup (TAD) and TAD status beside test bus. If a TAD has a test bus assigned, the status display on line 1

uses the letters LFH to show if either faults were detected on a TAD. They are:

- loss of signal (L)
- framing failure (F)
- high bipolar violation count (H)

Faults are shown by highlighting on the appropriate letter.

**Figure 1-2**
**The VT220 keyboard**




Use the keyboard, shown in Figure 1-2, to operate the DTH. It has two types of keys, hard and soft.

## Hardkeys

Hardkeys have specific permanent functions, and labels showing those functions. **`Return`** and the **`Arrow`** keys are the most frequently used hardkeys.

## Softkeys

Softkeys, which are usually assigned to function keys, perform different tasks depending on the application screen in use. The available softkeys are shown as icons on the bottom portion of the screen. For example, **`F6`** is usually the **`Close`** or **`Main Menu`** softkey.

## Basic key functions

Figure 1-3 shows the functions of some of the soft and hardkeys for several screens of the interface.

**Figure 1-3**
**Softkey and hardkey functions**

| Softkeys | Function |
|---|---|
| Main Menu | Exits the current screen and returns to the Menu of DTH Options. |
| Select | Selects an option from a menu. First, move the cursor to an option with the arrow keys, then press Select to choose the highlighted option. |
| Close | Exits the current screen and returns to the previously displayed screen. |
| Scroll Up, Scroll Down | Scrolls up or down through a list of available entries for a field. |
| First Page, Last Page, Previous Page, Next Page | Turns pages when more than one screen is required to display all the information. A paging banner appears at the bottom of the screen showing the current page.<br>Next Page and Previous Page wrap around from last to first page and from first to last page, respectively |
| **Hardkeys** | |
| Return | Ends input for prompted parameters and starts the test if this is the last or only parameter. |
| Tab | Moves the cursor to the next position in an input field. |
| X | When filling in fields, moves the cursor to the left<br>In channel select, erases the previously entered channel. |

### Selecting a menu option

Many screens display menus. To select a menu option, use the arrow keys to move the cursor to the option, and choose the **`Select`** softkey (the **`F14`** key.)

### Paging softkeys

Some screens have multiple pages. On these screens, a paging banner (page 1 of n) appears at the bottom of the screen. To move from page to page, use the paging softkeys: **`First Page`**, **`Last Page`**, **`Next Page`**, and **`Previous Page`**. **`Next Page`** and **`Previous Page`** wrap around from last page to first page and from first page to last page respectively.

### Scrolling softkeys

Some screens have fields where you must specify information. Some of these fields have pre-defined lists of acceptable values. To specify a value, scroll through the list until the value you want appears in the field. To scroll, use **`Scroll Up`** and **`Scroll Down`** softkeys after you select the field.

### The Return key

Use **`Return`** to enter information for fields and to confirm parameters.

## Power up and reset information

The DTH runs a hardware check during power-up and whenever a DTH reset occurs. During reset or power-up, the message ‘Nortel Networks Digital Test Head-power-up’ appears, showing the progress of the power-up or reset.

Figure 3-3 shows a screen that displays the status of the system components. If there are no faults, the message ‘Starting local terminal in 10 seconds’ displays, and the DTH Login screen appears. (The DTH Login screen does not appear if the hardware check detects a failure. Instead, the Hardware Diagnostic screen remains.)

You can reset the DTH at any time. However, if you do not first busy the ROTL or DTT lines at the MAP, you lose the calls on these lines.

Also, the DTH resets automatically whenever it detects that the minimum hardware configuration is absent. The minimum configuration is:

- CP card with ROMPACK
- DS1 interface card, or VF interface card
- one fully functional DS0 handler card

## Power down information

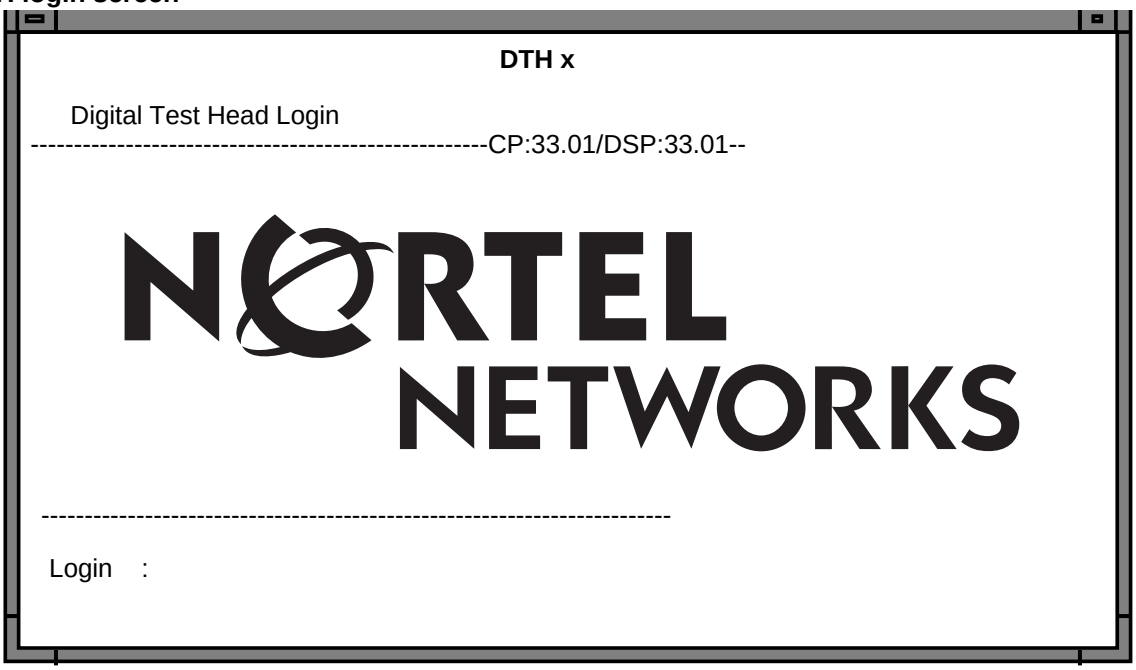
Before removing power from the DTH, go to the MAP and busy-out the trunks associated with the ROTL, TERM 105, DTHTP, and TERM 108. After again applying power to the DTH, return these trunks to service before beginning any testing.

To remove power from the DTH, remove its fuse/circuit breaker at the power source.

## Logging in and logging off

The DTH Login screen similar to the one shown in Figure 1-4 appears after the DTH initializes during power up.

**Figure 1-4**
**DTH login screen**




### Logging in

The login and password fields each have a length of up to 10 alphanumeric characters. Press **`Return`** to process the information. To log in, follow these steps:

- With the DTH Login screen displayed, type your Login ID (either local or admin) and press **`Return`**.

  *The password prompt appears.*

***Note:*** If the DTH Login screen does not appear, perform a **`Ctrl R`**, by holding down the **`Ctrl`** key and pressing the **`R`** key. This refreshes the screen, unless the initialization hardware check detects a fault. If you can not refresh the screen, reset the DTH by resetting the DTH as described under "Resetting DTH". You may also need to check the DIP switches on the CP card. Refer to 662-7001-200, for more information on DIP switch settings.

- Type your password and press **Return**.

  *For security, the password does not appear; the Menu of DTH Options appears.*

***Note:*** A new DTH has pre-set passwords for both the admin and local user IDs. In each case, 'system' is the preset password. The administrator should designate new passwords. (For instructions on changing passwords, refer to section "Changing password*s*".)

### Logging off

When DTH use is complete, log off to prevent unauthorized use. If you were testing, first perform a Disconnect before logging off.

1. If you are not in the Menu of DTH Options, return to it by pressing **F6**, Main Menu or Close until the Menu of DTH Options appears.
2. Highlight the DTH Logoff option and choose the **Select** softkey.

   *The DTH Login screen appears.*

## Required patches

Verify the datafill of the DMS-100 switch:

- If the switch is at BCS 32, verify the presence of patches RW061, RW062, RW070, RW067, and RW078.
- If the switch is at BCS 31 or 33, you need patches RW061, RW062, RW070, and RW078.

  ***Note:*** Contact your Nortel Networks Regional Support Office to determine if any additional patches are required to support the DTH.

These feature patches implement a new trunk type 'DTH', which indicates an incoming test access circuit from a DTH. It is a wink-start MF trunk that expects to receive digits in the same format as analog ROTL priming digits. It connects to several types of outgoing or 2-way trunks for completing to far-end test lines. It is capable of completing to home office test lines for verification.

The PATCH may require allocation of software resources. Each incoming DTH test access port requires a software extension block called a ROTL-PRIMING-BLOCK. The number of ROTL-PRIMING-BLOCKS must be at least equal to the total number of incoming ROTL ports, plus all incoming DTH ports. The size of table ROTLSCSD determines the block allocation in ROTL-PRIMING-BLOCKS. The ROTLSCSD tuple in TABLE SYSDATA controls the size of ROTLSCSD. If you need more ROTL-PRIMING-BLOCKS, increase the size of ROTLSCSD in the TABLE SYSDATA and perform a COLD RESTART. Although this increases the available size of ROTLSCSD, you need not add DTH ports to the table since they have no

association with SC or SD points. To verify if the patches are in the switch, on the MAP, enter:

```
>PATCHER; INFORM LIST patch
```

# Main menu and status options

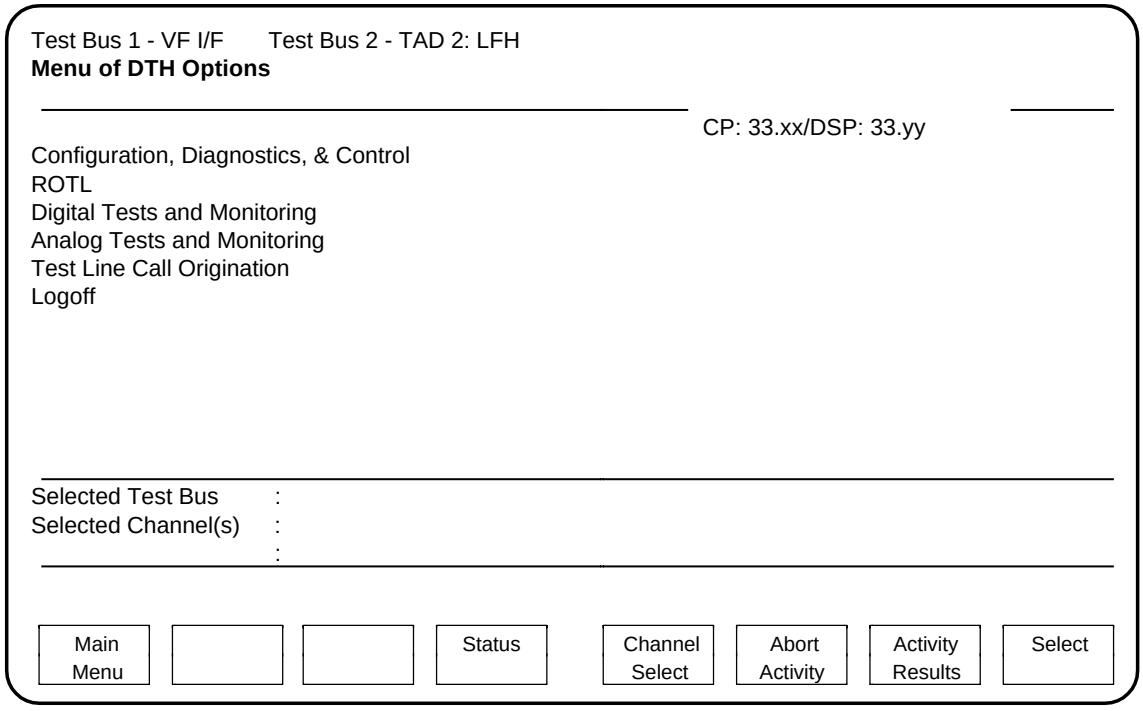
This chapter provides step-by-step instructions for each of the activities that can be performed at the local terminal by a tester or an administrator.

Perform these activities by selecting an option or by pressing a softkey from the Menu of DTH Options. Figure 2-1 shows the options and softkeys.

## Menu of DTH options

After you log in, the Menu of DTH Options, appears. It is the main menu and displays the major options you can select.

**Figure 2-1**
**Menu of DTH options**



***Note 1:*** The DTH Configuration, Diagnostics, and Control option is available only to the administrator.

***Note 2:*** There is a restriction on ROTL functionality unless your DTH is equipped with a VF interface card.

From the Menu of DTH Options, you can:

- select an option from the menu
- display the status of the selected channel(s), test engines, and TADs
- select a TAD and channel
- abort activities
- display activity results

To select an option, use the arrow keys to move the cursor to the option, and press the **`Select`** softkey. Each option leads to a second-level screen (except DTH Logoff). Figure 2-3 shows the hierarchy of the DTH screens.

## The screen's default values

Many of the screens display preset values called defaults. You may change these default values. When you do, the newly-entered values become the new defaults the next time you access that screen during that log in session.

## Main menu softkey functions

Table 2-1 shows the softkeys that appear on the Menu of DTH Options.

**Table 2-1**
**Main menu softkey functions**

| Softkey | Function |
|---|---|
| Main Menu = **F6** | re-displays the Menu of DTH Options |
| Status = **F9** | invokes a second bank of softkeys, the Status softkeys |
| Channel Select = **Fll** | select a TAD and one or more channels |
| Abort Activity = **F12** | Aborts the activity currently in progress on the chosen TAD and channel. You must first reply to a confirmation question. If you are using two or more channels for a test, the activity on all channels stops. |
| Activity Results = **F13** | Displays results for an activity on the selected TAD and channels. The activity may be 'in progress' or in the 'Results-pending' state. You see Results on the appropriate screen. If you are using two or more channels for a test, you may select either of them for result viewing. This command applies only to tests that do not provide immediate results automatically. Results screens are available for BER and Transients tests. |
| Select **F14** | selects the currently highlighted option |

The softkeys are shown in Figure 1-2. They are the keys labeled as **F6** through **F14**.

## Status softkey functions

You can allocate and deallocate channels using the **Status** softkey.

### Allocate command

Allocate seizes the currently-selected channel(s), and allocates them to the requester. The DTH rejects all commands other users send on the allocated channel(s) until released (using Deallocate) by whomever allocated them. The channel(s) must be in the idle state prior to allocation. This command requires no parameters.

To allocate a channel:

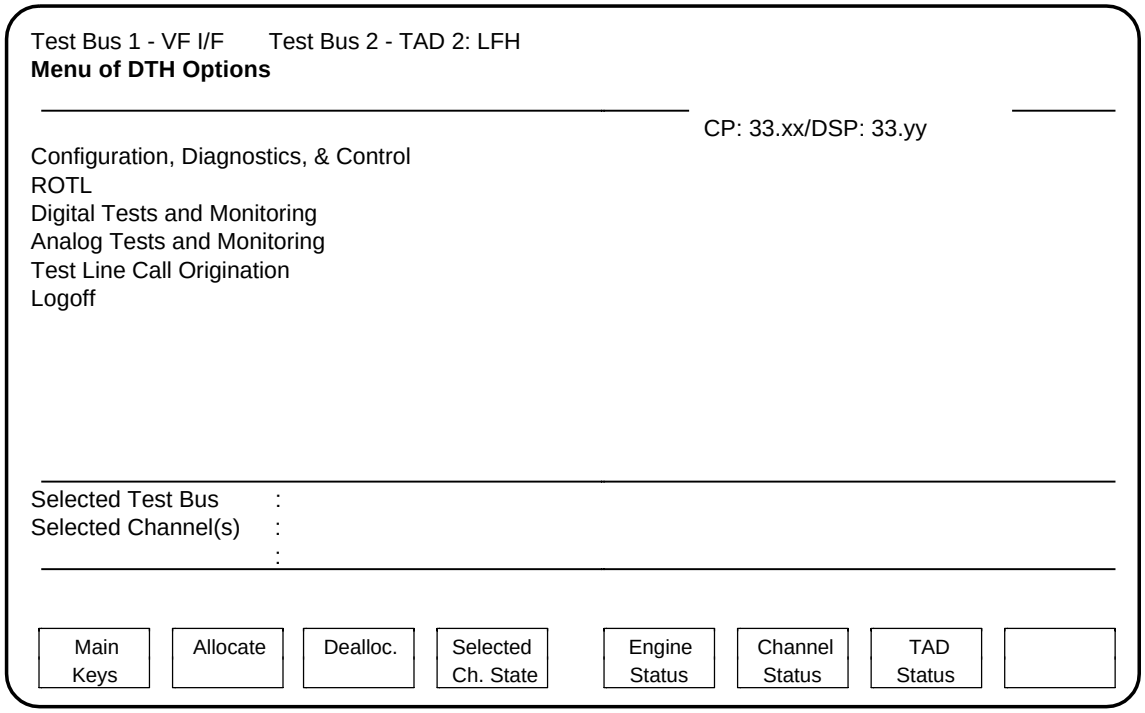
1. Choose the **Channel Select** softkey

   *The cursor moves to the lower portion of the screen for TAD and Channel selection.*

2. Enter the Test Bus (TAD) number (I or 2), and then the Channel number (01 - 24), and press **Return**.
3. Choose the **Status** softkey

   *The softkeys available on the screen change to resemble those in Figure 2-2.*

**Figure 2-2**
**Menu of DTH Options, with Status softkeys**




4. Select the **`Allocate`** softkey
   *A 'Channel allocated' message appears.*

5. Select the **`Main Keys`** softkey to continue.

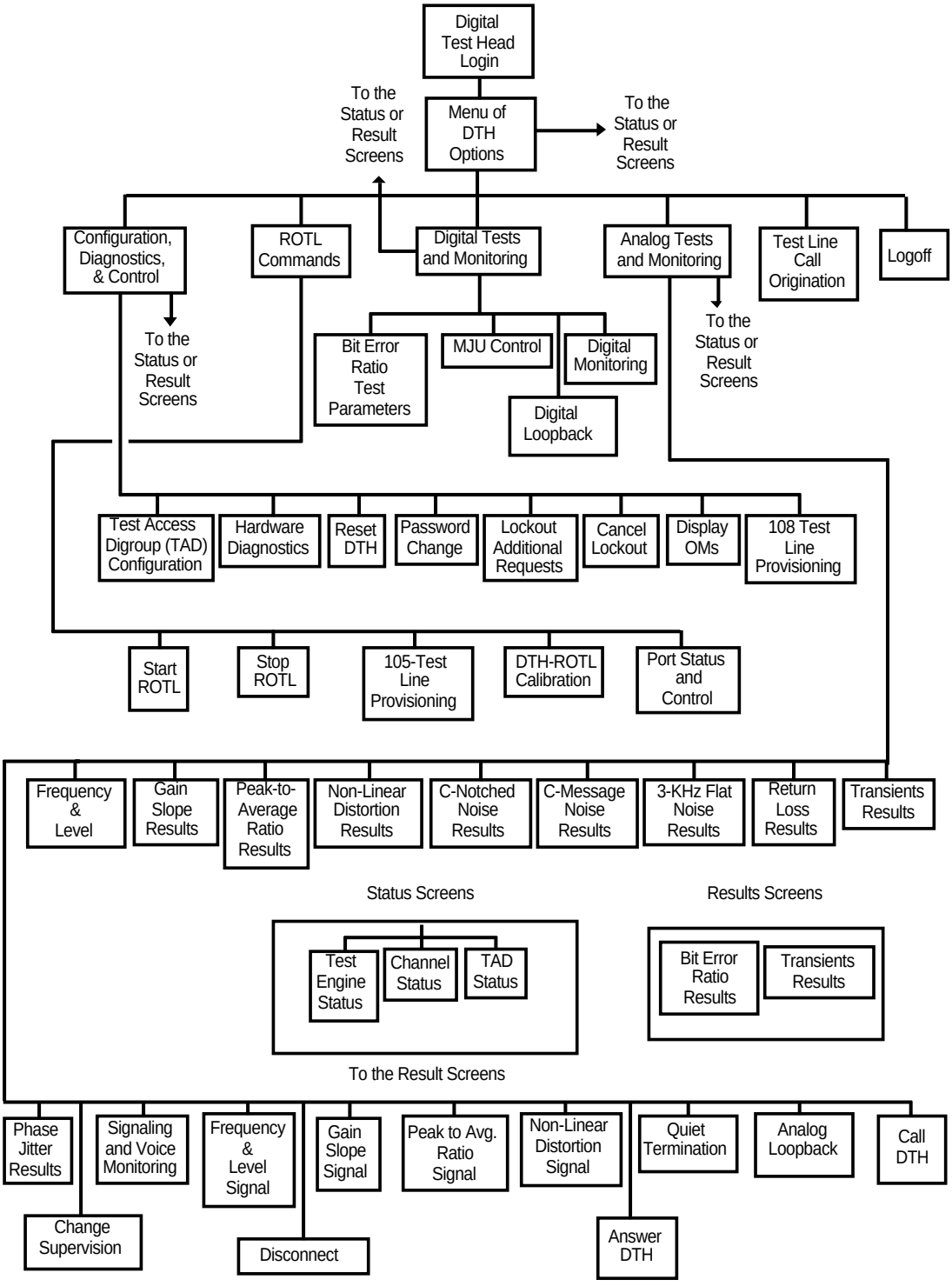
***Note:*** Only a DTH user with administrator privileges can release channels allocated by another user.

## Deallocate command

Deallocate releases previously-allocated channels. This command is typically used to deallocate a channel after performing a series of tests.It requires the TAD and channel parameters.

The procedure for de-allocating a channel is the same as for allocating except that you choose the **`Deallocate`** softkey.

**Figure 2-3**
**DTH hierarchy of screens**



## Selecting a TAD and channel

Before performing most DTH activities (for example, a test), you must select a TAD and channel.

To select a TAD and channel

1. On the Menu of DTH Options, choose the **Channel Select** softkey.

   *The cursor moves to the Selected Test Bus prompt.*

2. Enter 1 for TAD 1, or 2 for TAD 2.

   *The cursor moves to the Selected Channel(s) prompt.*

3. Enter the desired channel number(s) (01 through 24 are the valid entries, the leading zero is important), and press **Return**; use **Backspace** to erase an entry. (For most tests select only one channel.)

Only for 64 kb/s BER (bit error ratio) tests, and when placing channels in digital loopback mode require two or more channels. This is called channels performing joint activity.

(You can also select a TAD and channel from the Menu of DTH Options, screen by using the arrow keys to highlight the desired channel on the screen.)

## Aborting activities

You can abort an activity in progress or abort the results pending condition. The DTH administrator can abort any activity; testers can abort only those activities that they initiate.

To abort an activity:

1. On the Menu of DTH Options, choose the **Channel Select** softkey.

   *The cursor moves to the Selected Test Bus prompt.*

2. Enter 1 for TAD 1, or 2 for TAD 2.

   *The cursor moves to the Selected Channel(s) prompt.*

3. Enter the channel number(s) (01 through 24 are the valid entries), then press **Return**; use **Backspace** to erase an entry.
4. Press the **Abort Activity** softkey.

   *A prompt to confirm the request: '(Are you sure (Y/N)': appears.*

5. Press **Y**.

   *A 'Activity has been aborted' message appears.*

***Note:*** When BERT or digital loopback activities are occurring on more than one channel, if you abort one channel, it aborts the others.

## Displaying activity results

You see the results of most tests automatically. However for the BER and transients tests, you must request them. If there are pending results for a channel, you can not make other testing requests on that channel until you display the results. After displaying, the DTH discards them.

If a test result exceeds the maximum permissible value, plus signs (+++) appear on the screen. Similarly, if a test result is smaller than the smallest permissible value, minus signs (---) appear. A blank result means that the test results are invalid. Results for a transients or a BER test are available during the test as well as after.

To display activity results:

1. On the Menu of DTH Options, choose the **`Channel Select`** softkey.

   *The cursor moves to the Selected Test Bus prompt.*

2. Enter 1 for TAD 1, or 2 for TAD 2.

   *The cursor moves to the Selected Channel(s) prompt.*

3. Enter the desired channel number(s) (01 through 24 are the valid entries), then press **`Return`**; use **`Backspace`** to erase an entry. (For most tests select only one channel.)
4. Select the **`Activity Results`** softkey.

   *The results appear, if you are the owner or administrator.*

5. Select the **`Close`** softkey.

***Note:*** For channels performing joint activity (for example, BERT at 64 kb/s), the results are the same and displaying one channel is enough.

## Displaying selected channel status

You can ask to see the TAD and channel's state before testing. The DTH displays the current state on line 20. The channel's state can be either:

- Unavailable - ROTL
- TAD Failure - the TAD is down because the DTH has found that the DS1 Interface card has detected a loss of signal
- Idle - available to any user
- Allocated - available only to the user who seized it
- Connected - the channel has a connection, and it is available to the user who made it
- BERT res-pending - results are available for a BER test

- Transients res-pending - results are available for a Transients test
- Activity Name - the activity is in progress

To display the state of the selected channel:

1. Choose a TAD and channel, and press **`Return`**.
2. On the Menu of DTH Options, select the **`Status`** softkey.
   *The status softkeys appear.*
3. Choose the **`Selected Ch. State`** softkey.
   *The current state of the selected TAD and channel appear.*
4. To exit, select the **`Main Keys`** softkey.
   *The main softkeys re-appear.*

## Displaying test engine status

Figure 2-4 shows the status of each test engine. There are four test engines on each DS0 handler card.

**Figure 2-4**
**DTH Test Engine Status screen**

Test Bus 1 - VF I/F  Test Bus 2 - TAD 2: LFH

**DTH Test Engine Status**

CP: 33.xx/DSP: 33.yy

| Card | Engine | Status | Card | Engine | Status |
|---|---|---|---|---|---|
| 1 | 1 | Idle | 4 | 1 | BERT |
| | 2 | Idle | | 2 | Freq & Lvl l Signal |
| | 3 | Idle | | 3 | Idle |
| | 4 | Idle | | 4 | Analog Loopback |
| 2 | 1 | Idle | 5 | 1 | Answer DTH |
| | 2 | Call Originate | | 2 | Idle |
| | 3 | Idle | | 3 | Digital Loopback |
| | 4 | Idle | | 4 | Freq & Lvl Signal |
| 3 | 1 | Idle | 6 | 1 | Not Present |
| | 2 | Non-functional | | 2 | Not Present |
| | 3 | Transients | | 3 | Not Present |
| | 4 | C-Notched Noise | | 4 | Not Present |

Close

The screen displays the following information:

- Card - the card slot position of the DS0 handler
- Engine - the number assigned to the test engine
- Status - the current operating state of the test engine:
  - — Not present
  - — Non-functional
  - — Idle
  - — ROTL function (test engine is busy with ROTL functionality, or reserved for ROTL functions)
  - — Tests (The type of test in progress is indicated.)

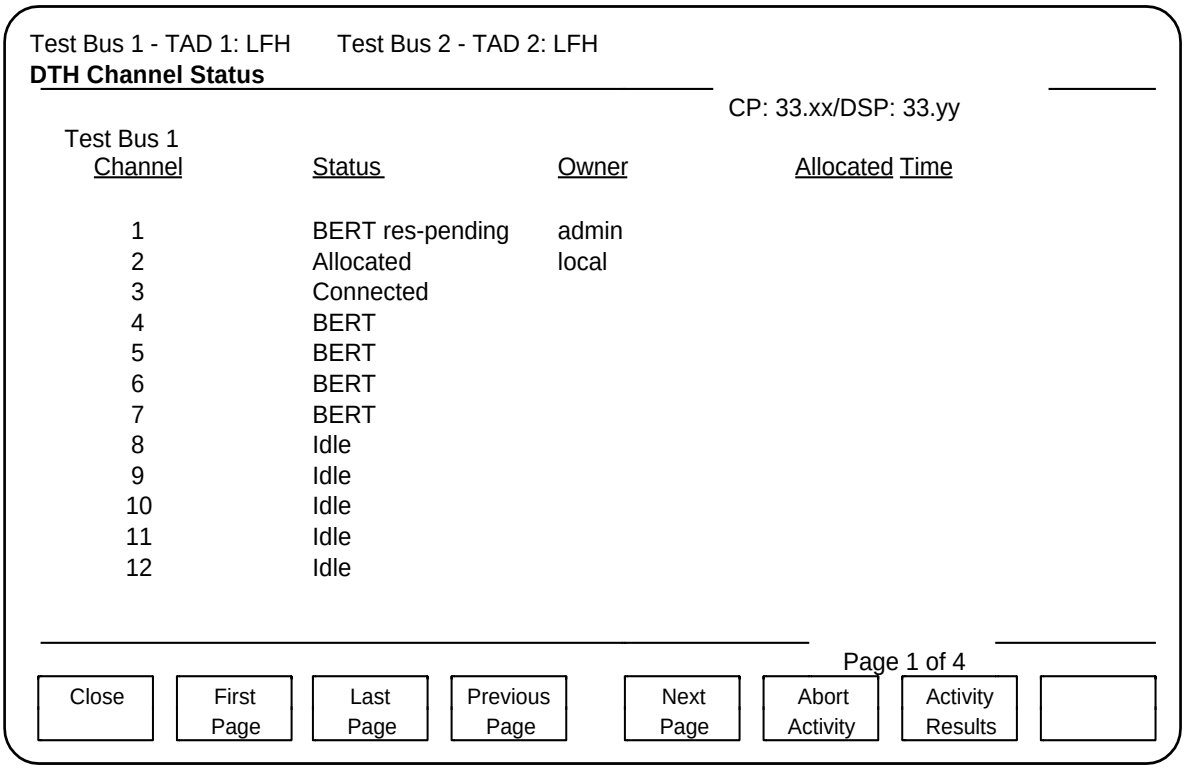
To display the status of the test engines, follow these steps:

1. Choose a TAD and channel, and press **`Return`**.
   *The status softkeys appear.*
2. Select the **`Engine Status`** softkey.
   *The DTH Test Engine Status screen appears.*
3. To exit, use the **`Close`** softkey.
   *The Menu of DTH Options appears.*
4. Select the **`Main Keys`** softkey.
   *The main keys appear.*

## Displaying channel status

The DTH Digroup Channel Status screen provides information for up to 48 channels. The first page displays the status for channels 1 through 12 on TAD 1. Subsequent pages display information for the remaining channels, see Figure 2-5.

**Figure 2-5**
**DTH channel status**




From this screen you can:

- view a display the status of all channels
- see if the test results are available
- abort an activity in progress, such as a test or a stimulus
- select a TAD and channel

The DTH Digroup Channel Status screen shows the:

- channel - channel number
- status - channel's status
- owner - user ID of the channel's current owner

You can display a channel's status from either the Menu of DTH Options or from a second-level screen. The following instructions explain how to display the status from the Menu of DTH Options.

## How to view the channel status screen

To view the Channel Status screen:

1. Choose a TAD and channel, and press **Return**.
2. Select the **Status** softkey on the Menu of DTH Options.

   *The status softkeys appear.*

3. Select the **Channel Status** softkey.

   *The DTH Channel Status screen appears.*

4. To move from page to page, use the **Next Page, Last Page, Previous Page**, and **First Page** softkeys.
5. If a channel has test results pending, display the results by using the arrow keys to select the channel, and then selecting the **Activity Results** softkey, the appropriate results screen appears.

(To return to the DTH Digroup Channel Status screen, use the **Close** softkey.)

6. If a channel has an activity in progress, abort the activity by using the arrow keys to select the desired channel, and choosing the **Abort Activity** softkey.

   *A prompt to confirm the request 'Are you sure? (Y/N)' message appears.*

7. The activity is aborted.
8. Select the new channel and choose the **Close** softkey.

   *I t selects the highlighted TAD and channel.*

9. To exit the DTH Digroup Channel Status screen, use the **Close** softkey.

   *The Menu of DTH Options appears.*

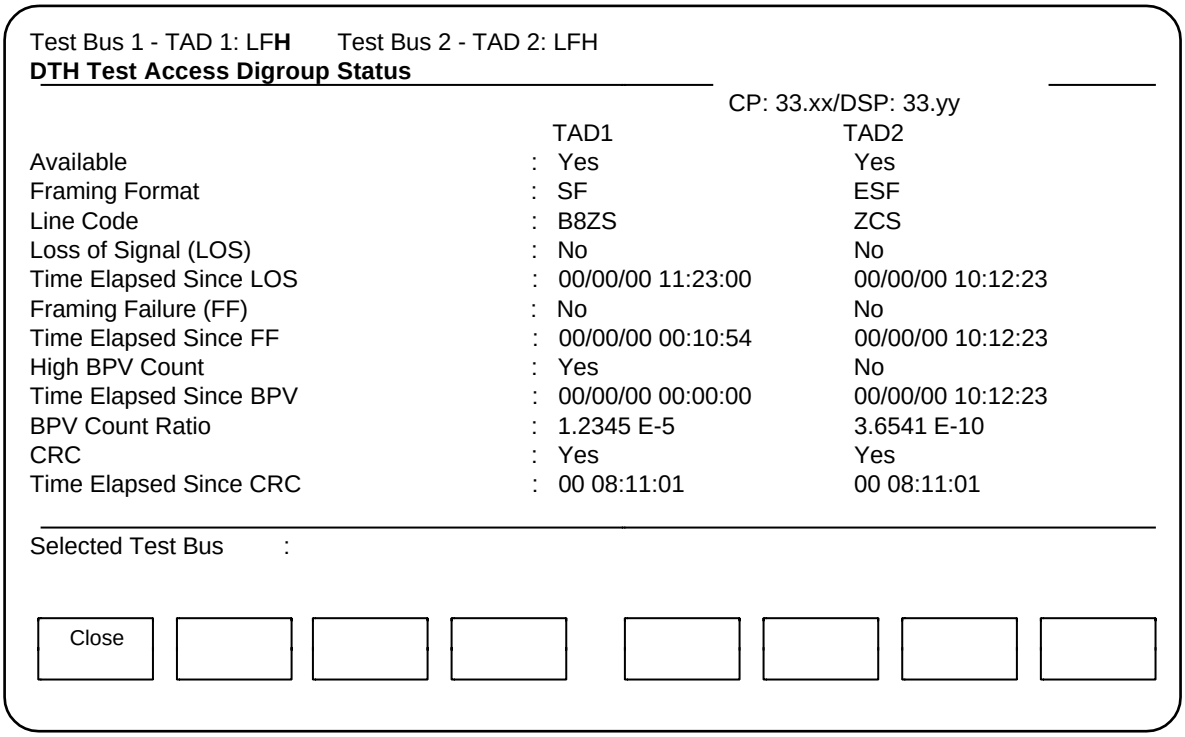
10. Choose the **Main Keys** softkey.

    *The main softkeys appear.*

## Displaying TAD status

Figure 2-6, provides information on the operating state of the two TADs. If the VF interface uses Test Bus 1, the fields for TAD 1 status are blank since TAD 1 is not active in the DTH.

**Figure 2-6**
**DTH test access digroup status**




The information displayed here is:

- available - yes or no
- framing format - SF or ESF
- line code is defined as follows:
  - — AMI -alternative marking inversion
  - — B8ZS - bi-polar 8 zero substitution
  - — ZCS - zero code suppression
  - — loss of signal indicator
  - — time elapsed since the last loss of signal (LOS)
  - — framing failure indicator
  - — time elapsed since last framing failure
  - — high bi-polar violation (BPV) indicator for BPV greater than 10-7 bpv/s
  - — BPV high count threshold
  - — time elapsed since last high BPV count

— BPV count for the last 10 seconds

— CRC time elapsed since CRC

### Using the TAD status screen

To display the status of the TAD:

1. Choose a TAD and channel, and press **Return**.
2. Select the **Status** softkey.
   *The Status softkeys appear.*
3. Select a TAD and choose the **TAD Status** softkey.
   *The DTH TAD Status screen appears.*
4. To exit, use the **Close** softkey.
   *The Menu of DTH Options appears.*
5. Choose the **Main Keys** softkey.
   *The Main softkeys appear.*

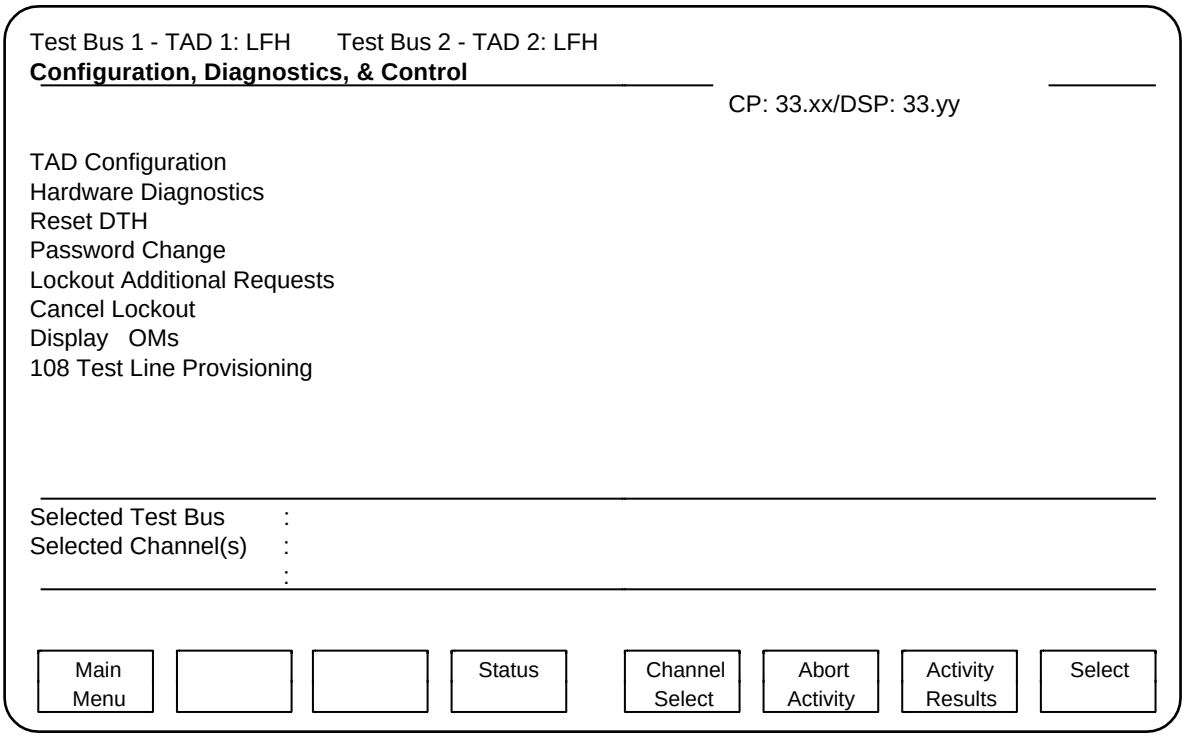
# Configuration, diagnostics, and control

The items shown in Figure 3-1 are available only to the DTH administrator. All procedures in this chapter assume that you are starting from the Menu of DTH Options. If you are not there, press **F6** repeatedly until it appears. (You must first select a TAD and channel.) Prior to initiating any of these commands, verify that the channel(s) you plan to use are not already in use.

To make a selection from this screen, first use the arrow keys to highlight your choice, and then press the **Select** softkey.

When finished using any of these choices, choose the **Close** softkey to return to this screen.

**Figure 3-1**
**Configuration, Diagnostics, & Control screen**

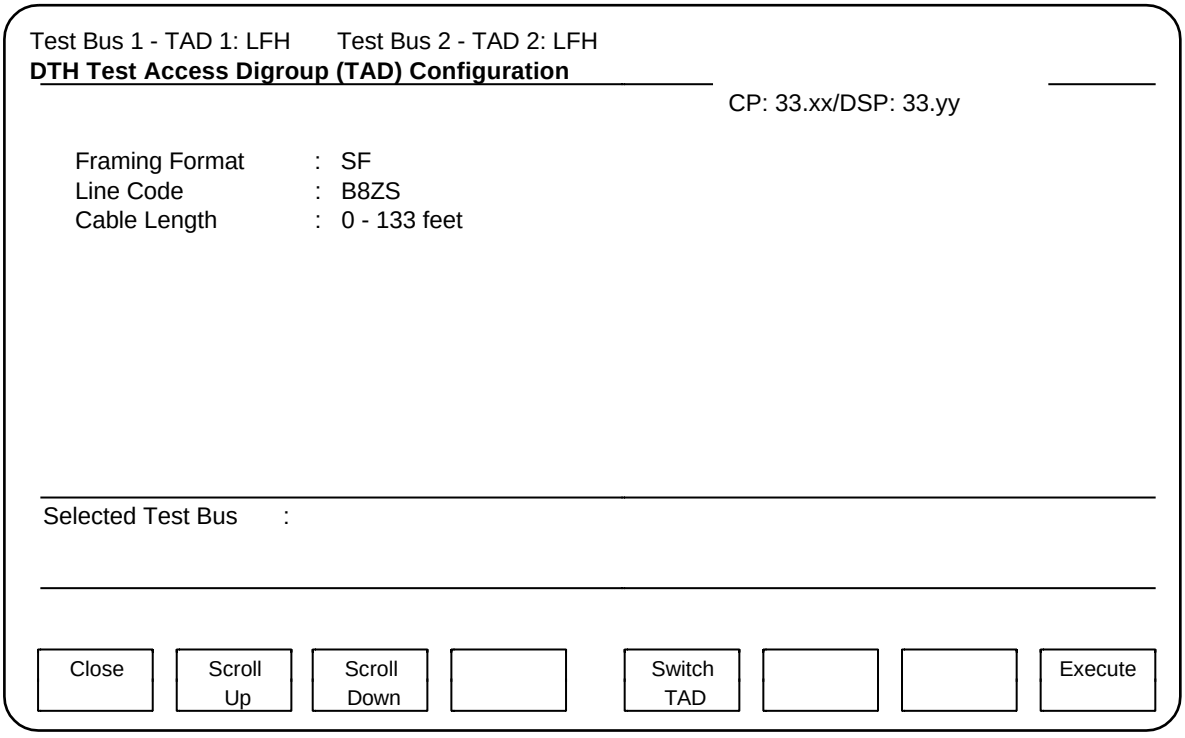


## Configuring TADs

The screen shown in Figure 3-2 controls the assignment of configuration parameters for the TADs.

The settings are in non-volatile RAM (NVRAM) so that they remain even after a power loss.

**Figure 3-2**
**TAD Configuration screen**




### Parameter entry

TADs are not provisioned upon installation. You can provision them when they are available for use. The possible provisioning parameters are:

- Framing format
  - SF (superframe)
  - ESF (extended superframe)
- Line code
  - AMI (alternate mark inversion)
  - B8ZS (binary eight zero substitution)

— ZCS (zero code suppression)

- Cable length in feet; the distance between the DTH and the DSX.
  - — 0-133 (0-40.5 m)
  - — 134-266 (40.84- 81.07 m)
  - — 267-399 (81.43-121.61 m)
  - — 400-533 (121.92-162.45 m)
  - — 534-655 (162.76-199.64 m)

### Configuring the TADs

This function allows you to define the type of transmission code to use on the TADs.

To configure the TADs:

1. Select TAD Configuration on the Configuration, Diagnostics, & Control screen.

   *The TAD Configuration screen appears.*

2. Use the cursor arrows to move through the parameters, using the **`Scroll Up`** and **`Scroll Down`** softkeys to select the desired parameter.
3. Select the **`Execute`** softkey to configure the selected TAD with the displayed TAD type.
4. Switch the display to the other TAD, if available, and configure it. (When test bus 1 is relates to the VF or Monitor interface, the DTH has only TAD2.)

## Running hardware diagnostics

This feature performs a hardware-checking routine that displays the DTH system and component status. The results appear on the DTH Hardware Diagnostics screen (Figure 3-3). All information is left intact during this test, but it stops all activities to enable the test engines to report their status.

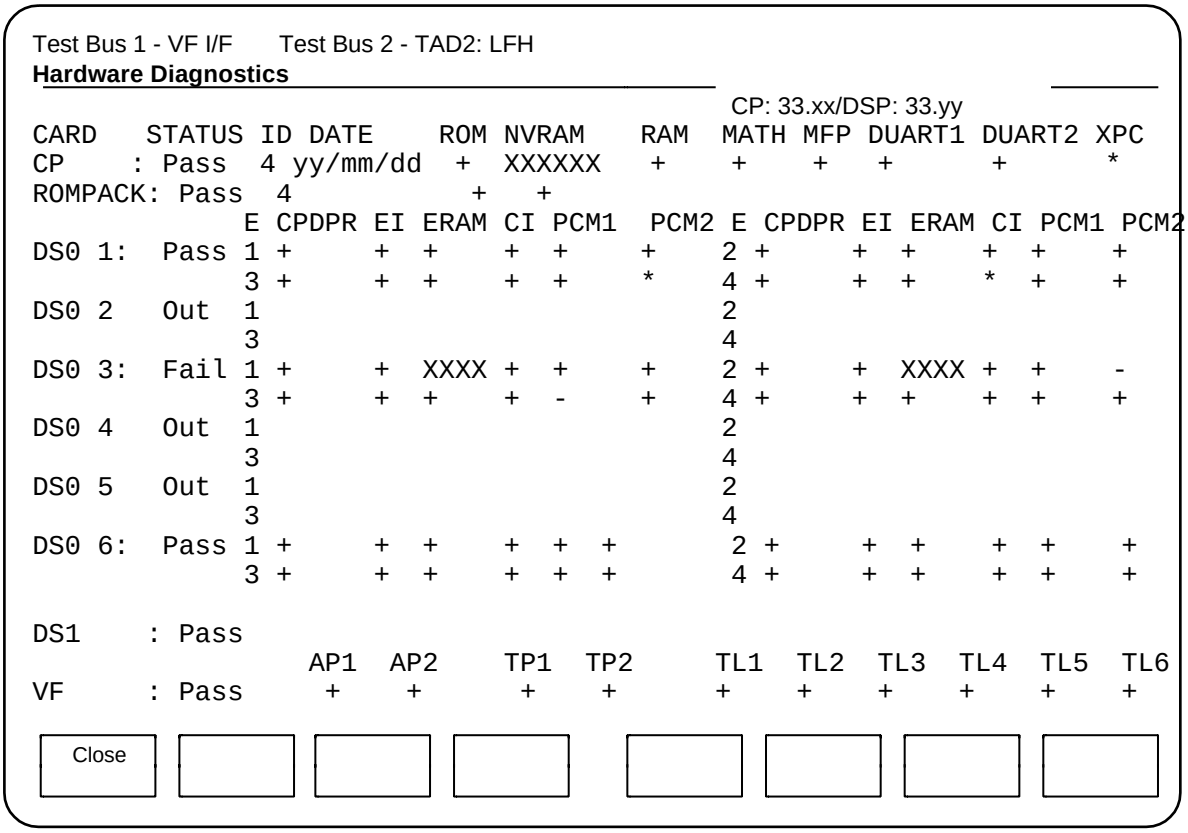
### Information returned

The DTH returns the following hardware information:

- control processor (CP) card's version number (Id field)
- date the CP bootROM was built
- on board CP ROM cyclic redundancy check (CRC) results
- CP non-volatile RAM test results. If it is corrupt, it shows the address, in hexadecimal, of the first one found.
- CP RAM test results. If it is corrupt, it shows the address, in hexadecimal, of the first one found.
- floating point math co-processor test results

- multifunction peripheral test results
- dual UART 1 and 2 test results
- bootROM's expected version number. It must match the CP's bootROM
- version for a successful power-up
- date the control processor of the ROMPACK firmware was built
- ROMPACK CRC check results
- ROMPACK non-volatile RAM test results. If it shows corrupt, it is the
- address, in hex, of the first one found
- for each of the possible 24 test engines
  - — CP communication dual port RAM (DPR) test results. If it is corrupt, it shows the address, in hexadecimal, of the first one found.
  - — CP/test engine communication interrupt test results
  - — test engine RAM test results. If it is corrupt, it shows the address, in hexadecimal, of the first one found.
  - — companion test engine communication test results
  - — internal test bus (TB) test results for both busses
- test access card test results. For the DS1 card, it shows a pass/fail indication. It shows the VF card status as a pass/fail indication of its access ports, test ports, and 105 test line ports.

**Figure 3-3**
**DTH Hardware Diagnostics screen**




### Running a hardware check

To run a hardware check:

1. Select Hardware Diagnostics on the Configuration, Diagnostics, & Control screen; the following message appears on line 21:

   *The activities in progress will be aborted. Continue? (Y/N):*

2. If you answer Y or y:

   *The DTH Hardware Diagnostics screen appears in a few seconds.*

3. If you answer N or n:

   *The message 'Hardware diagnostics canceled' appears on line 20.*

4. After viewing the diagnostics, select the **`Close`** softkey.

## Interpreting the diagnostics

Each card shows a test status, usually pass/fail. The STATUS field displays 'Out' if the card is not present.

***Note:*** The diagnostics routine can not return a status of OUT for the CP card.

Another possibility for this field is '*', which means that, although the card was present, there was no test on it. This may be the case with the DS1 card, when there are no functional DS0 cards present. You need two test engines to test the DS1 card.

For each card, there may be subfields describing the status of the card's various components. These subfields are usually of interest to a field technician or installer.

The CP card has the following subfields:

- ROM
- NVRAM
- RAM
- MATH
- MFP
- DUART 1
- DUART 2
- XPC

The ROMPACK has two subfields: ROM and NVRAM.

The DS0 card has four entries, one for each test engine. Each engine has the following subfields:

- E
- CPDPR
- El
- ERAM
- Cl
- PCMI
- PCM2

The DS1 card has no subfields; whereas the VF card has the following subfields:

- RAM - random access memory
- MATH - math co-processor
- MFP - multi-function peripheral

- DUART - dual universal asynchronous receiver/transmitter
- XPC - X.25 protocol controller
- ROM - read only memory cyclic redundancy check
- NVRAM - non-volatile RAM
- AP1- access port #1 (two-wire telephone line interface)
- AP2 - access port #2 (two-wire telephone line interface)
- TP1 - test port #1 (four-wire trunk interface to switch)
- TP2 - test port #2 (four-wire trunk interface to switch)
- TL1 - 105 test line #1 (four-wire trunk interface to switch)
- TL2 - 105 test line #2 (four-wire trunk interface to switch)
- TL3 - 105 test line #3 (four-wire trunk interface to switch)
- TL4 - 105 test line #4 (four-wire trunk interface to switch)
- TL5 - 105 test line #5 (four-wire trunk interface to switch)
- TL6 - 105 test line #6 (four-wire trunk interface to switch)
- E - Engine number
- CPDPR - dual port RAM accessed by the CP
- E1 - test engine Control Processor interrupt
- ERAM - test engine RAM
  - 0000 - 07FF: CP dual port RAM accessed by the test engine
  - 2000 - 2017: channel select DPR
  - 4000 - 47FF: companion test engine DPR
  - 8000 - BFFF: static RAM
- C1 - companion test engine interrupt
- PCM1- internal test bus #I
- PCM2 - internal test bus #2

The test status of the CP card is pass or fail. The test status for all other cards is pass, fail, blank (not inserted), or * (not tested).

In other fields, the symbols +, -, and * indicate pass, fail and not tested respectively. The symbol XXXXXX means an address in hexadecimal. It indicates a failure in RAM, NVRAM, CPDPR, or ERAM. It shows the first memory address found in fault.

If the DTH does not contain ROMPACK, the screen is blank after line 7. If there is no test access card, there is no testing DS0 cards. If no DS0 card is functional, there is no checking of test access card(s).

## Resetting DTH

A Reset causes all activities and operational measurements (OMs) to be lost.

To reset the DTH:

1. Select Reset DTH, from the Configuration, Diagnostics, & Control screen.
2. When the 'Are you sure (Y/N)?' prompt appears, enter Y or y (to cancel the request, enter N or n):

   *The screen clears. Hardware diagnostics appear as the system initializes.*

3. If everything passes, in a few seconds, the DTH Login screen appears.
4. You must again log in to DTH before using it.

## Changing passwords

To change a password:

1. Select Password Change from the Configuration, Diagnostics, & Control screen.

   *A series of prompts appear.*

2. Enter the appropriate information at the following prompts; press **`Return`** after each response:

   a. Enter user id

      *Enter the user ID (admin or local) for the password you want to change.*

   b. Enter old password

      *Enter the user's old password.*

   c. Enter new password

      *Enter the user's new password. (It can be up to10 alphanumeric characters long.)*

   d. Enter new password again.

      *To confirm the user's new password, enter it again.*

***Note:*** If you change a password and then lose or forget it, you can not recover it.

## Locking and unlocking DTH

Use this command to stop incoming requests before performing any maintenance activities. It idles the DTH before performing maintenance.

When you lock the DTH, it rejects requests by all users except the administrator. (There is no affect on requests made before DTH locking, or on

the current channel activities.) Only the administrator can unlock the DTH. After unlocking, other users can again access the DTH.

***Note:*** You need not specify a TAD and channel prior to performing these functions.

To lock or unlock the DTH:

1. To lock the DTH, select Lockout Additional Requests from the Configuration, Diagnostics, & Control screen:

   *The message 'Lockout now in effect' appears.*

2. To unlock the DTH, select Cancel Lockout, from the Configuration, Diagnostics, & Control screen.

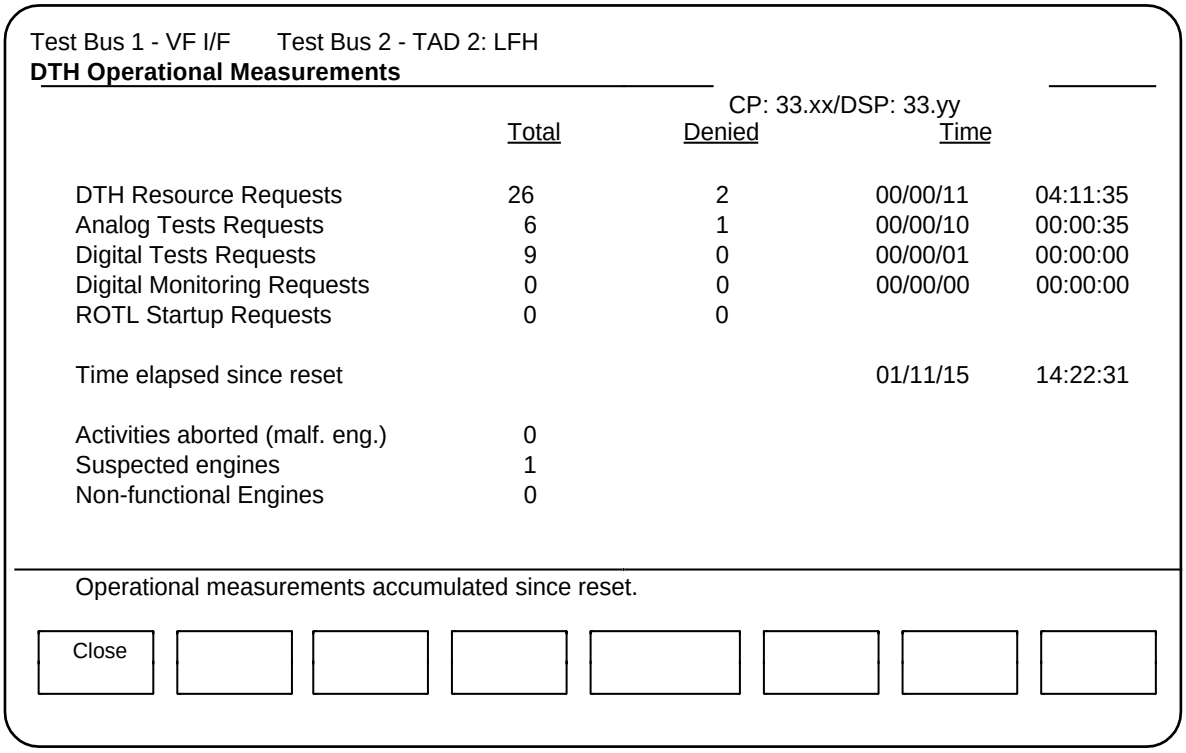
   *The message 'Lockout has been canceled' appears.*

## Displaying operational measurements

This command displays a list of operational or management information such as statistics on the frequency of use for certain tests.

When you select the Display OMs option, you get the operational measurements collected since the last reset. Figure 3-4 shows the relevant screen.

**Figure 3-4**
**DTH Operational Measurements**




The DTH collects and displays the following information for each type of request:

- total number of requests
- number of requests denied due to lack of resources (test engines)
- total amount of time to perform requests (not displayed for ROTL)

The DTH also shows the:

- time since it was last reset
- number of activities aborted due to malfunctions of test engines
- number of suspected test engines
- number of malfunctioning test engines

To display operational measurements:

1. Select Display OMs from the Configuration, Diagnostics, & Control screen.

   *The DTH Operational Measurements screen appears, displaying information collected since the last reset.*

2. To exit the screen, select the **Close** softkey.

   *The Configuration, Diagnostics, & Control screen appears.*

## 108 test line provisioning

A 108 test line is a specific trunk used to loop back information to the transmitting DTH. The line's primary function is to assist in measuring the integrity of the digital data transmitted between digital exchanges.

This function allows you to select (provision) 108 test lines. Perform this procedure upon installation, or whenever there is a need to change the number of lines provisioned. Channels provisioned for 108 test lines are not available for other functions; you must first de-provision them.

To provision a trunk for use in 108 testing, you must select the TAD, then the Channel, toggle the Provisioned entry for that line to yes, and specify the Disconnect Timer Value. (The default timer value is 20 min.)

1. Select Configuration, Diagnostics & Control from the Menu of DTH Options.
2. Highlight 108 Test Line Provisioning on the Configuration, Diagnostics & Control menu and choose the **Select** softkey.

   *The 108 Test Line Provisioning screen appears.*

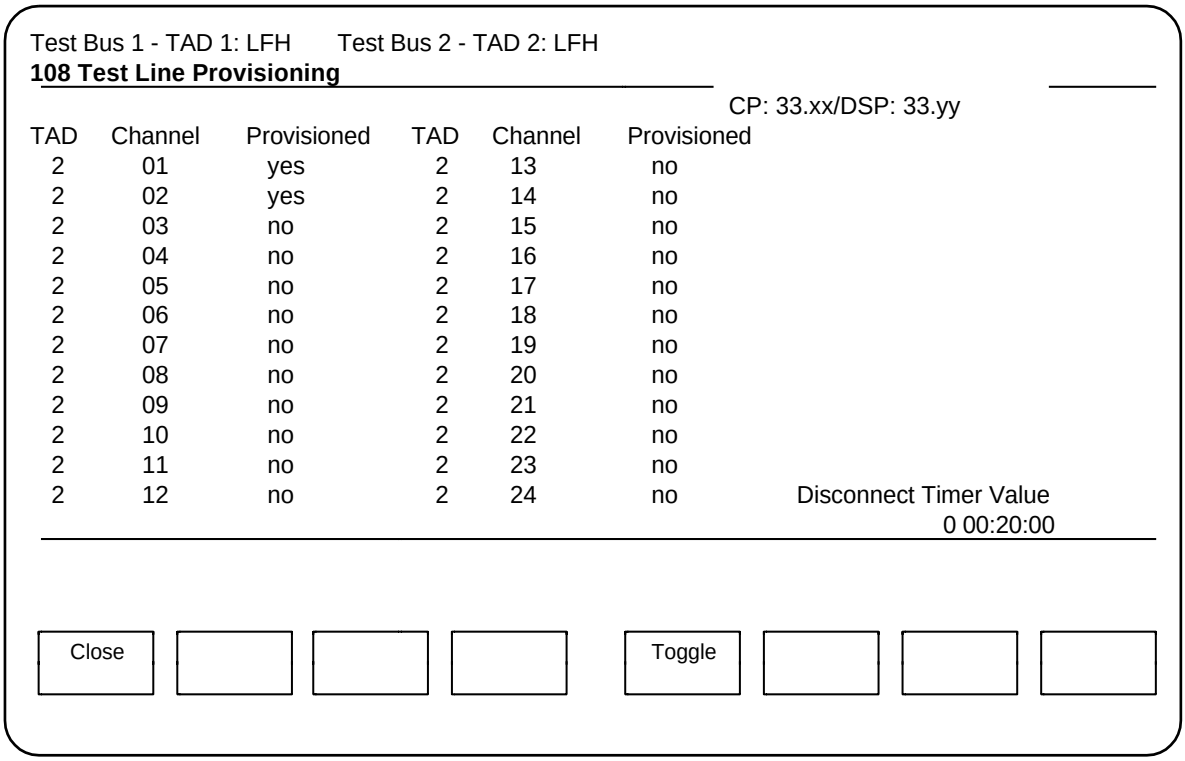
3. Use the **Up Arrow** and/or **Down Arrow** keys to highlight the TAD.
4. If applicable, use the **Toggle** softkey to select the TAD.
5. Press **Right Arrow** to move the cursor to the Channel column.
6. Enter a channel number between 01 and 24.
7. Press **Enter**, or use the default highlighted channel.
8. Use **Right Arrow** to move the cursor to the Provisioned column.
9. Use the **Toggle** softkey until ‘yes’ appears in the Provisioned column. Use the arrow keys to provision the appropriate lines.
10. Enter the Disconnect Timer Value. You can enter a maximum value of 9 days, 23 hr., 59 min., and 59 sec., the minimum is one second. (Refer to 662-7001-100, for an explanation of this field.)

    *After selecting a line for provisioning, the DTH performs a test on it to verify its integrity. A ‘Test in progress’ message indicates a successful test initiation. If the provisioning was not successful, either ‘Idle’ or ‘Not Present’ appears in the Provisioned column.*

11. When you de-select a line so that it is no longer provisioned for 108 testing, an ‘Activity aborted’ message appears.
12. Press the **Close** softkey to return to the Configuration, Diagnostics & Control menu.
13. Verify the success of the provisioning by performing a ’Channel Status’, or ’ Test Engine Status’, and viewing the entry for the appropriate line(s).

14. When done with the Configuration, Diagnostics & Control menu, use the **`Main Menu`** softkey to return to the Menu of DTH Options.

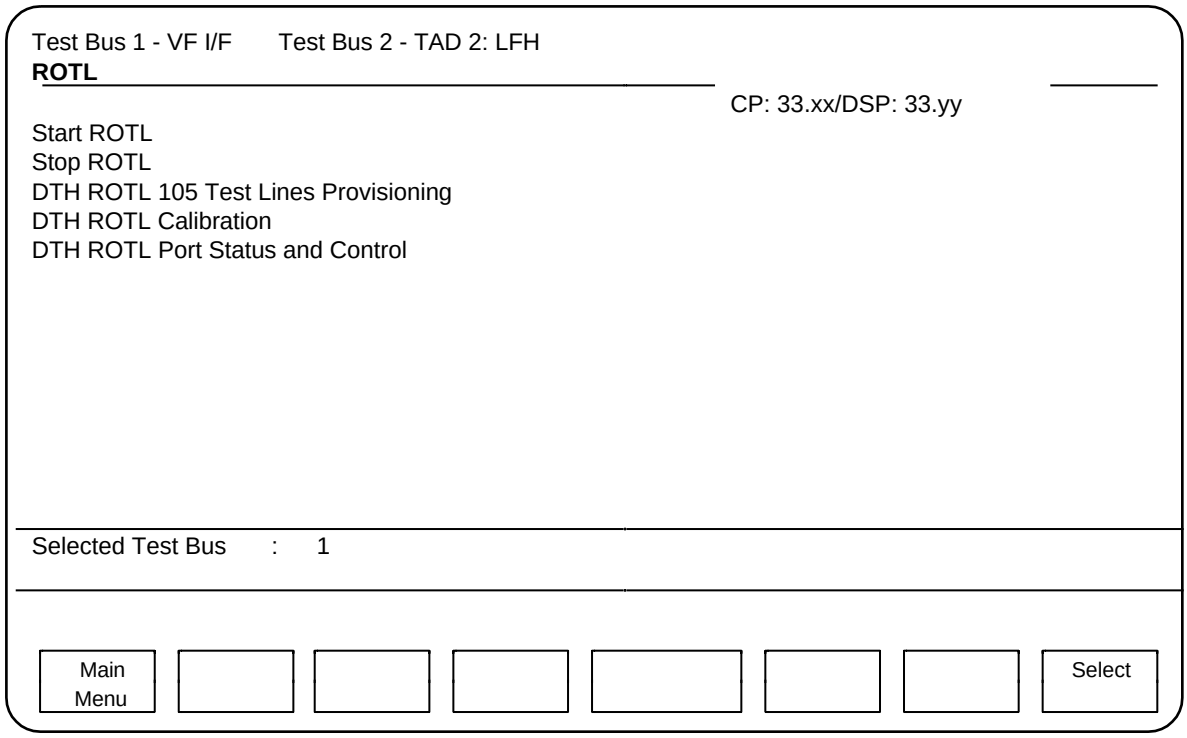
**Figure 3-5**
**DTH 108 Test Line Provisioning screen**



# ROTL commands

The ROTL Commands screen (Figure 4-1) is available to only the DTH administrator. All procedures in this chapter assume that you are starting from the ROTL Commands screen. This functionality is not accessible if the DTH does not contain a VF Interface module.

**Figure 4-1**
**ROTL commands screen**




## Screen description

The contents of the screen are:

- Start ROTL - enables the ROTL functionality
- Stop ROTL - disables the ROTL functionality

- DTH ROTL 105 test lines provisioning - invokes the screen shown in Figure 4-2
- DTH ROTL Calibration - invokes the screen shown in Figure 4-3
- DTH ROTL Port Status and Control - invokes the screen shown in Figure 4-4

## Starting and stopping ROTL

Use the Start ROTL and Stop ROTL options on the ROTL commands screen to enable and disable ROTL functionality.

To access this functionality:

1. Highlight ROTL on the Menu of DTH Options and choose the **`Select`** softkey.

   *The ROTL Commands screen appears.*

2. Highlight either Start or Stop ROTL as appropriate, and choose the **`Select`** softkey.

   *A 'Working...' message and then a 'ROTL functionality started (or stopped)' message appears.*

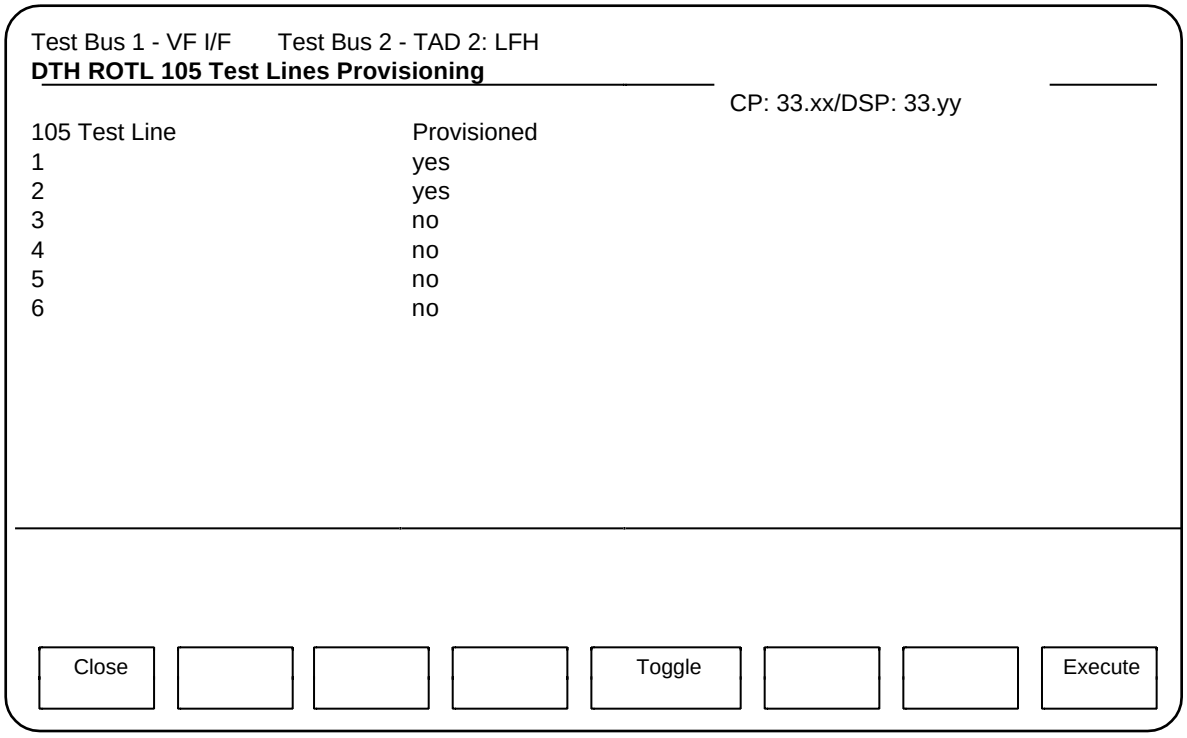
## Provisioning 105 test lines

This function allows you to select 105 test lines from the six available ports. Use it only prior to using ROTL functionality.

Use this screen to customize the number of 105 test lines available when ROTL starts. You can provision from 1 to 6 lines. By default, all six lines are provisioned. Figure 4-2 shows the 105 Test Line Provisioning screen.

Up to three 105 test lines can execute on a single test engine.

**Figure 4-2**
**105 Test Lines Provisioning screen**




To provision a 105 test line:

1. Select ROTL on the Menu of DTH Options.
   *The ROTL Commands screen appears.*
2. Select DTH ROTL105 Test Lines Provisioning on the ROTL Commands screen.
   *The DTH ROTL 105 Test Lines Provisioning screen appears.*
3. Move the cursor to the test line you want to provision/de-provision.
4. Choose the **`Toggle`** softkey to provision or de-provision the line.
5. Choose the **`Execute`** softkey to record the changes in NVRAM.
6. To exit, choose the **`Close`** softkey.
   *The ROTL Commands screen appears.*

## ROTL 105 transmission and line tests

Here are tests to verify the operation of the 105 test lines.

1. Determine and record the directory number for the 105 test line.

2. Connect the Blue Box to an incoming trunk and dial the 105 directory number to complete a 105 test line at the DMS.
3. At the TRKS TTP level of the MAP, post the TERM 105 group and busy all members except the one under test, enter:

**>MAPCI; MTC; TRKS; TTP**

*The TTP level appears.*

4. Enter:

**>POST G TERM105** <x> where <x> is the trunk group number

*It posts the trunk.*

5. Enter:

**>MANUAL**

*OK appears.*

6. Enter:

**>BSY**

7. Post the incoming trunk connected to the Blue Box. Enter:

**>POST T TERM105 <y>** where <y> is the trunk under test's number

8. Enter RTS:

*OK appears.*

9. At the Blue Box, dial the 105 directory number.

*Hear a loud tone, and the incoming trunk and TERM 105 goes to CPB.*

10. Disconnect the configuration.
11. Repeat steps 3 through 6 for each member of the TERM 105 group to test all 105 test lines on all ROTL units.

## Calibrating the DTH-ROTL

This function allows you to compensate for both transmit and receive signal losses. These losses are due to:

- the cable connecting the test ports and 105 test lines to the DMS trunk interface card
- the gain characteristics of the codec driving these ports on the VF Interface card

You must store calibration values for both transmit and receive losses on the two test ports and test lines. Determine these calibration values when you install a new VF interface, or when changing connecting cables. The DTH stores the calibration values in NVRAM. It uses them in adjusting ROTL-

related test calculations for the losses incurred through the VF test access. For better accuracy, the DTH determines these losses at three frequencies.

## DTH/ROTL calibration

The calibration of the ROTL requires knowledge of the DMS- 100 operations. To prepare for ROTL calibration, you must:

1. Set up the local terminal, if required.
2. Log in to the local terminal and MAP.
3. Stop the ROTL.
4. Set the 3X91 switches.

After performing these steps, begin calibration.

***Note:*** Whenever you replace either the NT7F29xx pack on the DTH/ ROTL, or the 3X91 or 2X59 packs on the switch, you must calibrate the DTH/ROTL. If you replace either the NT7F23xx or NT7F26xx, again calibrate the DTH/ROTL.

### Setting up the local terminal

Set-up the VT220 according to the instructions in Table 4-1, if they are not already set.

**Table 4-1**
**Local terminal set-up**

| **Communication set-up** |
|---|
| seven bits/character |
| odd parity |
| one stop bit |
| 9600 baud rate |
| **General set-up** |
| VT220 mode, 7 bits controls |
| Tx=Rx |

***Note 1:*** On the NT7F23AB control processor, place SW 2-7 and SW3-2 and SW3-8 ON; place all other switches OFF.

***Note 2:*** On the EIA port, on the data leads connect the cable to the ASYNC PORT 2 on the back of the DTH.

## Logging in

Log on to the local terminal with a login of ‘admin’, and a password of ‘system’. Then log on to your MAP.

## Stopping the ROTL

To begin the procedure:

1. Use the arrow keys on the local terminal, to move the cursor to the ROTL option.
2. Choose the **Select** softkey.

   *The ROTL Commands screen appears.*

3. To stop the ROTL, move the cursor to the Stop ROTL option, and choose the **Select** softkey.

   *The ROTL stops.*

## Setting the 3X91 switches

To set the 3X91 switches; at the MAP, (mapci;mtc;trks;ttp), post the first ROTL port and perform a diagnostic on that circuit. Do this for each ROTL port and term 105 test line.

### Setting a zero point of reference

To set a zero point of reference:

1. Disconnect connectors A, B, C, D, and E from the DTH backplane.
2. (Find the location of each ROTLTP and TERM 105 (3X91 location and its circuit number). >POS G (ROTLTP or TERM 105), press **Return** at the MAP.
3. Write each location down (TM8 number and circuit number). To go to the next circuit, type ‘next’ or 12 at the MAP.
4. If the circuit is even, the transmit pins on the TM8 backplane are T-2A and R-3A. The receive pins are TI-34A and RI-33A.
5. If the circuit is odd, the transmit pins on the TM8 backplane are T-4A and R-5A. The receive pins are TI-32A and RI-31A.

### Zeroing the backplane -- the zero point of reference

To zero the backplane:

1. At the local terminal, select the DTH/ROTL Calibration option. The cursor is on Test Port 1. (You can change the port number by pressing either **F7** or **F8** to scroll up or down respectively. After Test Port is Test Line.)
   a. Test Port - maximum of two (2) per DTH/ROTL
   b. Test Line - maximum of six (6) per DTH/ROTL
   c. Busy the circuit at the MAP that corresponds with the Test Port or Test Line posted on the local terminal. Pull that 3X91 out, and verify that the transmit and receive pads are set initially to RX=12 and TX=9.

2. Man-busy the ROTL 105 test lines associated with the 3X91 trunks.
3. Go to the 3X91 card(s) and remove it so that you can change the pad switch settings.
4. Set the dip switches as shown in Table 4-2.

**Table 4-2**
**3X91 Dip switch settings**

| | **Receive in** | **0n** | **Transmit in** | **On** |
|---|---|---|---|---|
| Even | S1.0 | 4, 8 | S3.0 | 8 |
| circuit | S2.0 | 0 | S4.0 | 1 |
| Odd | S1.1 | 4, 8 | S3.1 | 8 |
| circuit | S2.1 | 0 | S4.1 | 1 |

5. Reinstall the 3X91 card.

## Transmit zeroing method

1. Connect the Transmission Test Set (TTS), HP 4935A (for example) to the Transmit tip and ring pins. These are the pins on the backplane of the TM8 that supports the 3X91 the DTH terminal has posted (even circuit T-2, R-3; odd circuit T-4, R-5).

Configure the Transmission Test Set (TTS) as follows:

a. Display - Receive (RCV)
b. 310 plug - set in the Normal position
c. Set up- terminate into 600 OHMS
d. Measurement - Level frequency
e. Termination - made to the TTS

2. Verify that Table TRKGRP contains the NO PAD Group Option NPDGP) for ROTLTP AND TERM 105 (POST G ROTLTP or POST G TERM105)
3. Verify that Table MWDATA contains the following: 0 0 1004.

***Note:*** If your switch software is BCS 35 or later, do not take 7 dB out of the 3X91 Pads. Prior to BCS 35 the calibration of each ROTLTP and TERM 105 was made easier by subtracting 7dB from the Transmit pad on each 3x9I (EVEN S3.0/S4.0, ODD S3.1/4. 1) at this point. You should have to 2.00 dB padding in the Transmit PAD of each circuit when the seven dB is taken out. The 3X91 only needs (BSY;TST;RTS) and continue the calibration procedure.

4. At the MAP, (mapci;mtc;trks;ttp), return the 3X91 card(s) to service. Test these cards. The test fails because the hardware switch setting and the datafill in the switch do not match. Once these steps are complete, begin calibration.

5. Verify that Table TRKGRP contains the No PAD Group Option (NPDGP). Verify that Table MWDATA contains the following: 0 0 1004.

## Starting the ROTL

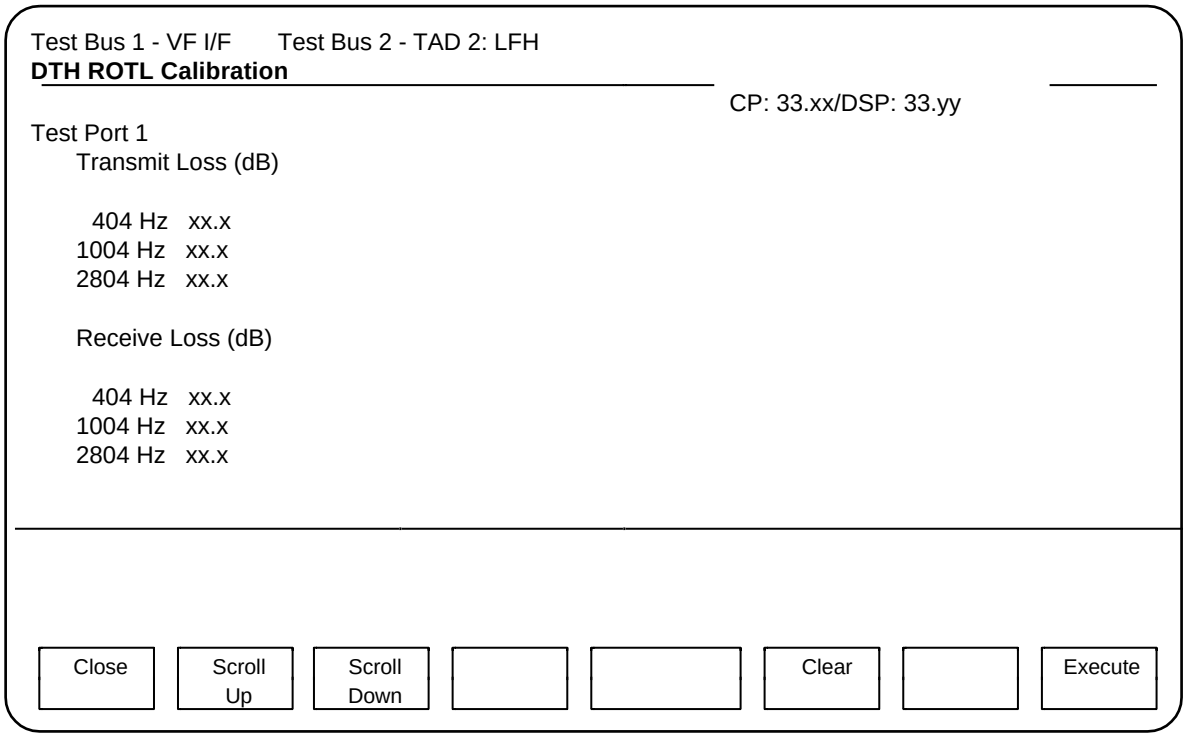
To start the ROTL:

1. Highlight the ROTL option.
2. Choose the **`Select`** softkey.

   *The ROTL Commands screen appears.*

3. To start the ROTL, highlight the Start ROTL option, and choose the **`Select`** softkey.

**Figure 4-3**
**DTH ROTL calibration**




## Calibrating ROTL transmit

Calibrating the transmit functionality requires both a coarse and a fine adjustment, which are given below.

## Coarse calibration adjustment

To make the coarse calibration adjustment:

1. Enter the following commands at the MAP:

```
>MAPCI;MTC;TRKS;TTP;POST G xxx;MANUAL
```

(where xxx is the type of circuit (ROTLTP or TERM 105))

To measure the transmitting signal from the ROTL to the DMS, enter this command:

**>LOSS**

2. Move the cursor down to the DTH ROTL Calibration, and choose the **Select** softkey.

   *The cursor moves to Test Port 1.*

3. To change the port, press the **Scroll Up** or **Scroll Down** softkeys to scroll up or down.
4. Start with Test Port 1 on the local terminal. Select 1004 Hz from the transmit screen on the local terminal and choose the **Select** softkey.
5. The MAP should receive 1004 Hz from the local terminal. The 3X91 pad switches SI.0 and S2.0 are for the Even circuit while S1.1 and S2.1 are for Odd circuits. Once the switch accepts the input, it measures the dB loss and displays it on the terminal. Use the 3X91 switch settings to make a coarse calibration adjustment in .25 dB increments. The following is examples of ranges for the Hz level on the MAP. These ranges may vary slightly.
   a. 1004 Hz 0.0 -> 0.3. With this result, remove .25 dB using the appropriate switches on the 3X9 1.
   b. 1004 Hz 0.0 > 1.2. With this result, remove I dB using the appropriate switches on the 3X91.

***Note:*** Each time you change the 3X91 pad switches you must, at the MAP, (mapci;mtc;trks;ttp), Bsy, Rts, and Tst the 3X91 card(s). Test these cards. The test fails because the hardware setting and the software in the switch do not match. Once these steps are complete, calibration may begin.

6. Use the 3X91 pad settings to get as close as possible to 0 by repeating step 4 for the 1004 Hz transmission.

## ROTL fine calibration adjustment at 404, 1004, and 2804 Hz levels

To make the fine calibration adjustment:

1. At the TTP level on the MAP, enter:

**>MAPCI; MTC;TRKS;TTP; POST G xxx;MANUAL**

(where xxx is the type of circuit (ROTLTP or TERM 105))

To measure the transmitting signal, enter the following command:

**>LOSS**

2. At the ROTL Calibration screen, choose the **Select** softkey, and the dB level should be as close to the 0.0 level as possible on the MAP; for example: 404.0, 1004.0, and 2804.0. If the dB level is .3 at the MAP, decrease it using the **Scroll Down** softkey. If the dB level is -. 1, increase it, using the **Scroll Up** softkey.

3. Repeat step 2 for 404 Hz, 1004 Hz, and 2804 Hz.

## Calibrating ROTL receive

To calibrate ROTL receive:

1. Set the MAP to transmit.
2. Enter the following command to generate a 0 dB level:

   **>MAPCI;MTC;TRKS;TTP;POST G xxx;MANUAL**

   (where xxx is the type of circuit (ROTLTP or TERM 105)

3. To transmit, enter the following command:

   **>TGEN xxx y** (where xxx is the frequency and y is 0)

4. Move the cursor to Receive Loss, 1004 Hz.
5. Have the MAP, transmit at 1004.0 Hz to the local terminal as in step 2. Choose the **Select** softkey to accept the switch output. The 3X91 pad switches S3.0 and S4.0 (transmit) are for the Even circuit, while S3. I and S4. I (transmit) are for the Odd circuits. When the DTH accepts the input, it measures the dB Loss, and displays it on the terminal. Use the 3X91 switch settings to make a calibration adjustment in .25 dB increments. The following are examples of the frequency level, these ranges may vary slightly:
   a. 1004 Hz 0.0 -> 0. With this result, remove .25 dB using the appropriate switches on the 3X91.
   b. 1004 Hz 0.0 > 1.2. With this result, remove 1 dB using the appropriate switches on the 3X91.
6. Use the 3X91 pad settings to get as close to 0 as possible by repeating step 2 for the 1004 Hz transmission.
7. Have the MAP transmit at 404.0 Hz to the local terminal as in step 2. Use the **Select** softkey to accept the switch output. Do not change the switch settings for this step.

   *The DTH completes the fine tuning calibration after you press the Select softkey.*

8. Have the MAP transmit at 2804.0 Hz to the local terminal as in step 2. Use the **Select** softkey to accept the switch output. Do not change the switch settings for this step.

   *The DTH completes the fine tuning after you press the Select softkey.*

## Calibration of other test ports

Repeat the transmit and receive test steps for each test port and each test line.

## When finished calibration

After completing the calibration, restart the ROTL.

1. Choose the **Close** softkey to close the current screen.

   *The ROTL Commands screen appears.*

2. Move the cursor to Start ROTL, and choose the **`Select`** softkey to execute.

   *The ROTL begins operation.*

### Final alignment of 3X91 pad switch settings

Perform the following after the calibration is complete to comply with the DMS-100 test software application.

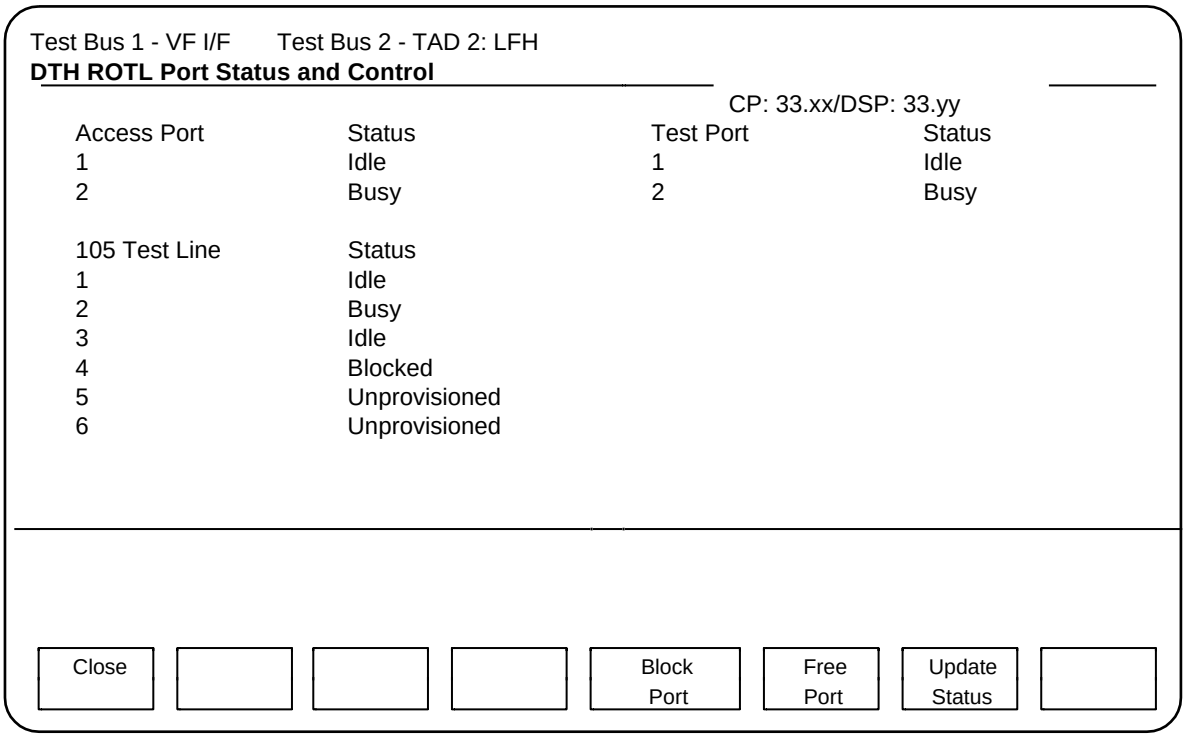
1. At the MAP, busy the 3X91 card(s) associated with the ROTL.
2. Go to the 3X91 card(s), and remove it to change the switch settings. Change the switch settings, for both sets of S3.0/S4.0 to an additional 7 dB (you used these switches to complete a coarse calibration). Leave the settings for S1.0/S2.0 as they were. Reinstall the 3X91 card.
3. Return the 3X91 card(s) back to service.
4. Perform a diagnostics test on the 3X91 card(s).

***Note:*** There is an optional Tone Verification procedure available upon request from customer service.

## Displaying the ROTL Port Status and Control screen

Use the DTH ROTL Port Status and Control option to display and change the status of the ROTL ports, Figure 4-4 appears. The port status indicates the type of port (access port, test port, or 105 test line, and its current state). You can also block the ROTL interface access port and 105 test line ports using the softkeys available here.

**Figure 4-4**
**ROTL Port Status and Control**




The possible states are:

- idle
- busy
- blocked
- unprovisioned (only for 105 test lines)

## Blocking ports

You can block (make busy) an access port or a 105 test line.

To block a port:

1. Select ROTL on the Menu of DTH Options.
   *The ROTL Commands screen appears.*
2. Select the DTH RTOL Port Status and Control from the ROTL Commands screen.
   *The Port Status and Control screen appears.*
3. Use the arrow keys to move the cursor to the port you want to make busy.

4. Choose the **Block Port** softkey.

   *The port status changes to blocked, and a 'ROTL port blocked' message appears.*

5. To exit, choose the **Close** softkey.

   *The ROTL Commands screen appears.*

## Freeing ports

To restore a blocked access port or a 105-test line to its original state:

1. Select ROTL on the Menu of DTH Options

   *The ROTL Commands screen appears.*

2. Select DTH ROTL Port Status and Control.

   *The Port Status and Control screen appears.*

3. Use the arrow keys to move the cursor to the port you want to unblock.
4. Choose the **Free Port** softkey.

   *A 'ROTL port unblocked' message appears.*

5. To exit, use the **Close** softkey.

   *The ROTL Commands screen appears.*

## Updating the status

If the status of a port became busy while you are viewing the screen, use the **Update Status** softkey to see the new status. Use the **Close** softkey to return to the ROTL menu.

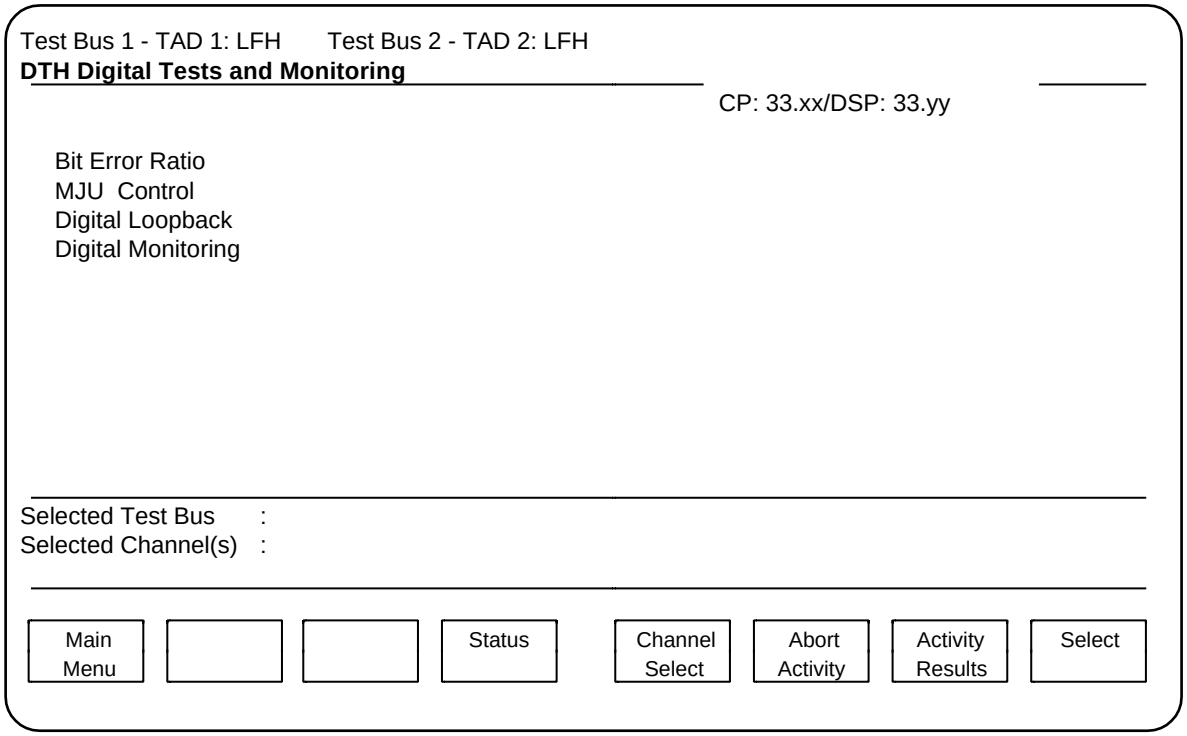
# Digital tests and monitoring

The Digital Tests and Monitoring menu (Figure 5-1) allows you to perform the following:

- BER testing, and viewing the test's results
- Multi-Junction Unit (MJU) testing to check individual branches of multi-point connections in the DDS network
- performing a digital loopback for signaling bits on a TAD and channel(s)
- digital monitoring for monitoring the digital data communications

To exit a test, and return to the Digital Tests and Monitoring menu (Figure 5-1), press the **`Close`** softkey from any parameter entry or results screen.

**Figure 5-1**
**DTH Digital Tests and Monitoring screen**



You must specify input parameters for the BER, and MJU control tests. The values shown in the following screens are the defaults. If the DTH can not perform a test, a message appears on line 20 describing the problem.

> ***Note:*** After initiating a BERT, you must request the results before the channel on which the test is running is free for other tests.

Any channels used for these functions must first be idle. You may also allocate them to yourself using the Allocate command.

## Bit error ratio test

This section explains how to perform a BERT. You can test sub-DS0 DS0A format data rates supported by DDS (Digital Data Services), of:

- 2400
- 4800
- 9600
- 56 000 baud

Here are the sub-DS0 DS0B format data rates that DDS supports:

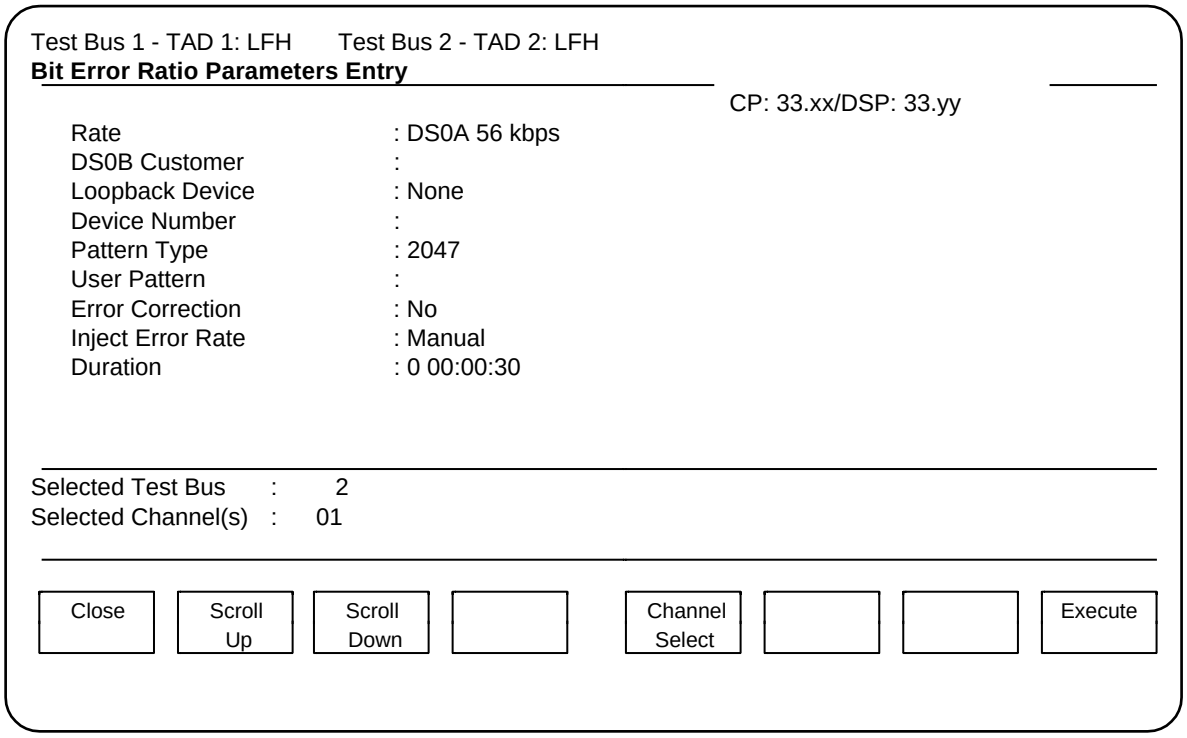
- 2400
- 4800
- 9600 baud

You can also use full 64 kb/s DS0 channel rates on any number of selected channels. Figure 5-2 shows the relevant screen.

You must do the following prior to performing a test:

- Assure that the channels you want to use are either idle, allocated, or connected.
- Establish a test access path.

**Figure 5-2**
**Bit Error Ratio Test Parameters Entry screen**




## Entering parameters for the BERT

When you select the Bit Error Ratio option from Digital Tests and Monitoring menu, the Bit Error Ratio Test Parameters Entry screen (Figure 5-2) appears. Select values for the following parameters:

- Rate - the rate at which to perform the test. Either:
  - — DS0A at 2.4 kb/s (1 channel only)
  - — DS0A at 4.8 kb/s (1 channel only)
  - — DS0A at 9.6 kb/s (1 channel only)
  - — DS0A at 56 kb/s (1 channel only) (default)
  - — DS0B at 2.4 kb/s (1 channel only)
  - — DS0B at 4.8 kb/s (1 channel only)
  - — DS0B at 9.6 kb/s (1 channel only)
  - — DS0 at 64 kb/s on any number of selected channels
- The DS0B customer of interest - the range of this field depends on the DS0B rate. Allowable values for this field are:
  - — 1 (default)

  - 1-20 for 2.4 kb/s rate
  - 1-10 for 4.8 kb/s rate
  - 1-5 for 9.6 kb/s rate
- Loopback device - Loopback device required for sub DS0 testing rates. Enter 'None' when there is digital loopback at the far-end (FE). Allowable values for this field are:
  - none (default) -- no loopback device
  - invoke 56 kb/s repeater loopback
  - invoke latching OCU (office channel unit) loopback
  - invoke non-latch HL96NY
  - invoke latching CSU loopback (customer premises channel loopback)
  - invoke MJU latching loopback
  - invoke latching DS0 dataport (DS0DP) loopback
  - invoke non-latching OCU (office channel unit) loopback
  - invoke latching HL96NY loopback
  - invoke non-latching CSU loopback (customer premises channel loopback)
  - invoke non-latching DSU (data service unit) loopback
  - invoke non-latching DS0 dataport (DS0DP) loopback
  - invoke latching DSU
- Device number - device number of interest. Applies only if the Loopback device field contains either latching DS0DP or 56 kb/s repeaters. Allowable values for this field are:
  - device 1 (DS0 dataport latching loopback or 56 kb/s repeater)
  - device 2 (DS0 dataport latching loopback or 56 kb/s repeater)
  - device 3 (DS0 dataport latching loopback)
  - device 4 (DS0 dataport latching loopback)
  - device 5 (DS0 dataport latching loopback)
  - device 6 (DS0 dataport latching loopback)
  - device 7 (DS0 dataport latching loopback)
  - device 8 (DS0 dataport latching loopback)
- Pseudo-random pattern type - the pseudo-random or stress pattern desired. Allowable values for this field are:
  - 511 = 511 bit pseudo-random pattern ($2^{9}$-1)
  - 2047 = 2047 bit pseudo-random pattern ($2^{11}$-1) (default)
  - $2^{15}$-1 bit pseudo-random pattern (PRBS-15)

  - — $2^{23}$-1 bit pseudo-random pattern (PRBS-23)
  - — low ones density stress pattern
  - — medium ones density stress pattern
  - — all ones stress pattern
  - — alternating medium and low ones density stress pattern
  - — alternating high and low ones density stress pattern
  - — alternating ones and zeroes stress pattern
  - — user pattern (6, 7, or 8 bits)
  - — ASCII fox pattern
  - — EBCDIC fox pattern
  - — BCDIC fox pattern
  - — Baudot fox pattern
- User defined sequence - specify the input bit pattern if the Pattern field contains User pattern. (A bit pattern is a sequence of 0s and 1s.)
  - — 8 bit pattern is required for DS0(s) 64 kb/s
  - — 7 bit pattern is required for DS0A 56 kb/s
  - — 6 bit pattern for all other rates
- Error correction - apply it to the received data when a test is conducted on DS0A subrates 2.4, 4.8, and 9.6 kb/s. Error correction is not available on DS0A at 56 kb/s and DS0B formats. The entry may be either:
  - — Yes - error correction is applied
  - — No - error correction is not be applied (default)
- Inject error rate - while performing a BERT, you may wish to inject errors in the output sequence. You may inject errors on DS0As, DS0Bs, DS0 (64kb/s, and multiple DS0s). Allowable values for this field are:
  - — manual - inject one error is be injected each time you select the Inject Error softkey in the activity results screen (default)
  - — $10^3$ - one error injected every $10^3$ bits transmitted
  - — $10^6$ - one error injected every $10^6$ bits transmitted
- Duration - the test's duration. Enter only digits in this field. The separating spaces and periods are not input. The format is d hh.mm.ss, where:
  - — d (days) may be 0 to 9
  - — h (hrs) may be 00 to 23
  - — m (min) may be 00 to 59
  - — s (seconds) may be 00 to 59 only if min, hrs, or days are greater than 0.

The minimum value is 1 second.

This field does not use the scroll keys. **Tab** advances through the fields, **Backspace** moves backwards through the fields.

## Running the BERT

Prior to initiating a BERT, you must perform DTH 108 Test Line Call Origination to establish the a connection to the FE 108 digital loopback test line. Refer to section "DTH108 test line call origination" in this manual for instructions on how to perform that task.

To run the BERT:

1. On the Menu of DTH Options, choose the **Channel Select** softkey.

   *The cursor moves to the Selected Test Bus prompt.*

2. Enter 1 for TAD 1, or 2 for TAD 2.

   *The cursor moves to the Selected Channel(s) prompt. If the DTH has a ROTL card, you can use only TAD 2.*

3. Enter a channel number(s) (01 through 24 are the valid entries), and press **Return**. Use **Backspace** to erase a channel. (For most tests, select only one channel.)
4. Select Digital Tests and Monitoring on the Menu of DTH Options.

   *The Digital Tests and Monitoring screen appears.*

5. Select the Bit Error Ratio option from the Digital Tests and Monitoring screen.

   *The Bit Error Ratio Test Parameters Entry screen appears.*

6. Select the parameters as described in *Entering parameters for the BERT*.
7. Choose the **Execute** softkey to begin the test. The system performs a BER measurement on the chosen TAD and channel for the specified duration. The following messages may appear, depending on the circumstances:

   ```
   Test in progress; Waiting for synchronization

   Test in progress; Synchronization achieved

   Unable to synchronize. Invalid DS0 format specified

   Test aborted; Failed to start loopback
   ```

8. You can check the status of the test at any time. For instructions, refer to section *Displaying selected channel status*. To display the results of the test, refer to section *Displaying bit error ratio results.*

## Displaying Bit Error Ratio Test results

This procedure explains how to display BERT results. Figure 5-3 and Figure 5-4 show the relevant screens.

**Figure 5-3**
**Bit Error Ratio Test Results screen (page 1)**

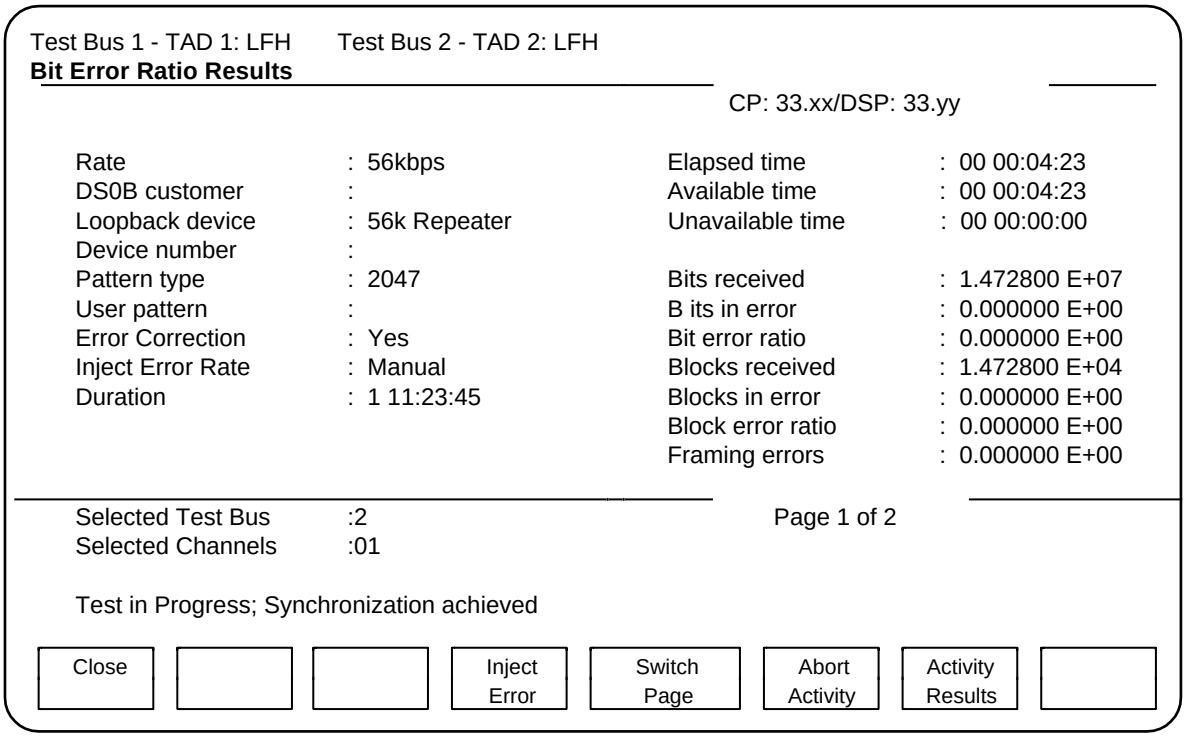
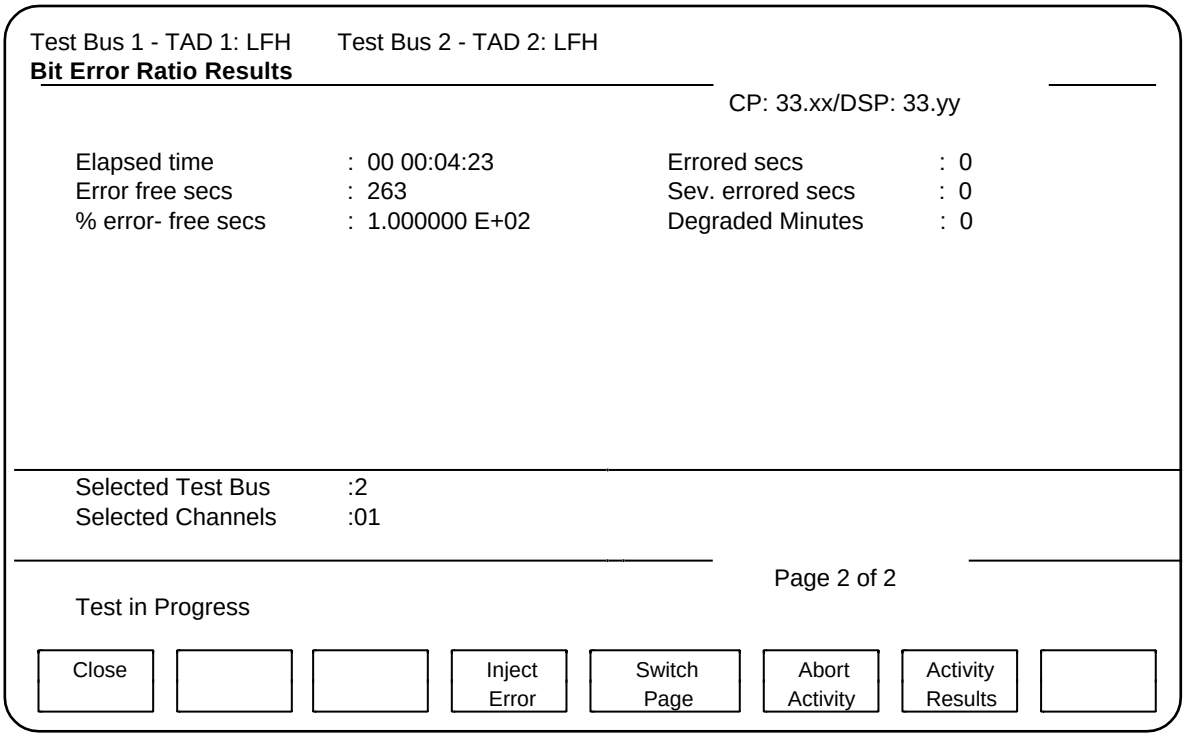


**Figure 5-4**
**Bit Error Ratio Test Results screen (page 2)**




When a test starts, the DTH sends the control sequence to activate the specified loopback device. These control sequences vary in length depending on the loopback device. During this process, the message

```
Working...
```

appears. After transmitting the optional loopback sequence, the DTH tries to synchronize on the incoming bit sequence to compute the BER. If there is synchronization within the first second, the message

```
Test in progress; Synchronization achieved
```

appears. The channel status becomes ‘BERT’ and an appropriate message displays after selecting when the channel activity results display. The time remaining for the test starts to decrease.

If the DTH can not synchronize within the first second, the channel status becomes ‘BERT’ and the message

```
Test in progress; Waiting for synchronization
```

appears. This message also appears when requesting results and but there is not yet synchronization The message continues until either there is synchronization, or you abort the activity. While the DTH tries to synchronize on the bit pattern, the time remaining does not decrease.

For DS0B, you must specify the rate. It may be lower than the rate of the DS0B. For example, a 2.4 kb/s customer may be multiplexed on a 9.6 kb/s DS0B. For DS0B subrates, the test engine detects a DS0B test attempt on a DS0B for which an invalid customer was specified (for example, for a 4.8 kb/s signal multiplexed with four 9.6 kb/s signals). The error message is:

```
Unable to synchronize. Invalid DS0 format specified
```

Results are available if there is synchronization.

## Displaying results

You can request results from a number of screens, such as the Menu of DTH Options, the Channel Status screen, or the Digital Test and Monitoring screen.

To display the results of a BERT:

1. On the Menu of DTH Options, choose the **`Channel Select`** softkey.

   *The cursor moves to the Selected Test Bus prompt.*

2. Enter 1 for TAD 1, or 2 for TAD 2.

   *The cursor moves to the Selected Channel(s) prompt.*

3. Enter the channel number(s) (01 through 24 are the valid entries), then press **`Return`**. Backspace erases a channel. (For most tests select only one channel.)
4. Select the **`Activity Results`** softkey.

   *The Bit Error Ratio Test Results screen appears.*

5. Use Switch Page to display the other results page.
6. Abort Activity aborts the BERT.
7. After viewing the BERT results, and recording them appropriately, use the **`Close`** softkey to return the Menu of DTH Options.
8. Then, highlight Test Line Call Origination, and choose the **`Disconnect`** softkey.

   *The following message appears:*

   ```
   Connection has been dropped
   ```

9. Next, select the **`Close`** softkey to return to the Menu of DTH Options.
10. If testing is complete, log off the DTH.

***Note:*** If the test is not complete, selecting the **`Activity Results`** softkey updates the following results every second:

— bits in error for the last second

— blocks in error for the last second

With this information, the CP calculates additional statistics based on the number of bits transmitted and the elapsed time.

## Interpreting results

Use the **`Activity Results`** softkey to ask for results. The test returns the following results:

- Input parameters - for the BERT, on the BER Parameters Entity screen Figure 5-2 using the parameters you chose: the rate, subrate channel, the loopback device, the pattern, and the duration.
- Elapsed time - seconds elapsed since synchronization was achieved
- Bits received - total number of bits received
- Bits in error - total number of bits in error
- Framing errors - framing errors in the last second (For DS0B only)
- Bit error ratio - bits in error/bits transmitted during the available time
- Blocks received - bits received/1000
- Blocks in error - total number of blocks in error. If one or more bits in a block is corrupt, the block is in error.
- Block error ratio - blocks in error/blocks transmitted during the available time
- Error-free seconds - the number of seconds when no error was detected during the available time
- Percentage error-free seconds
- Errored seconds - seconds in which there was at least one error, but the bit error ratio was less than $10^{-3}$
- Severely errored seconds - seconds in which the BER has exceeded$10^{-3}$. This means more than 1 in 1000 bits are in error.
- Degraded minutes - a count of available minutes in which the BER is greater than or equal to $1^{-4}$ bit errors per available minute
- Available time - the time the unit was available for testing, beginning with the receipt of a sync signal and ending with the completion of the test. This is exclusive of any time intervals deemed unavailable
- Unavailable time - after encountering ten consecutive severely-errored seconds, the TUT is considered unavailable. The unavailable time is recorded from the beginning of the ten consecutive errored seconds. During the unavailable time, there is no BER results accumulation except for elapsed time. Unavailable time is a probable indication of a

catastrophic failure. Therefore, if there were BER results recording, they would swamp the results collected during the available time.

The BERT returns to available time and result accumulation after the accumulation of ten consecutive error free or errored seconds.

## MJU control

The MJU Control test checks individual branches of multi-point connections in the DDS network. You can test up to four branches. The input and output signals are in the DS0A signal format. The DS0A may be carrying a 2.4, 4.8, 9.6, or 56 kb/s data stream.

MJUs allow multi-point connections in the DDS network. By connecting the DTH to the control leg, you may test individual branches.You can test up to four branches. You can cascade MJUs by tying the control leg of a second MJU to a branch of the previous MJU. The MJU input and output signals are in the DS0A signal format. The DS0A may be carrying a 2.4, 4.8, 9.6, or 56 kb/s data stream.

To provide testing capabilities, branches of a MJU can be:

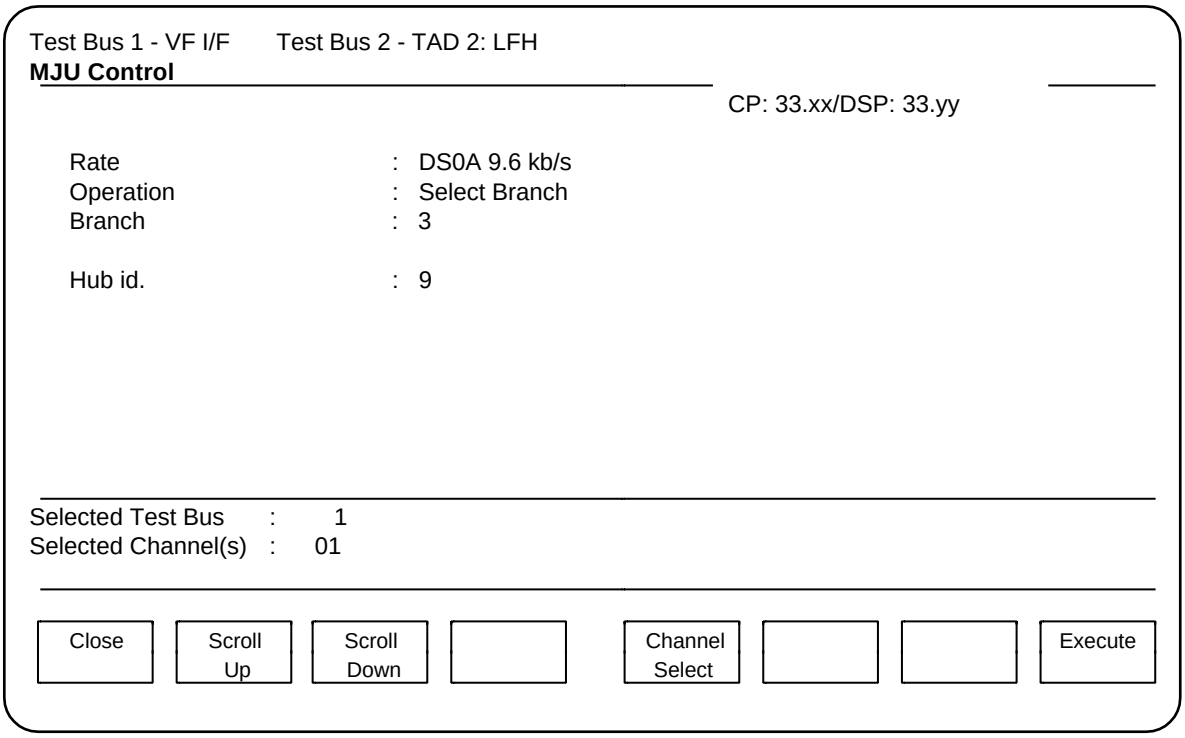
- selected (tied temporarily to the control leg)
- released (returned to normal operation)
- blocked (removed from service in case of trouble)
- unblocked (restored to service)

After selecting a branch, it returns its hub and branch identification. The DSP engine then continues to transmit control codes to the MJU. This maintains the branch in the selected state until all branches are chosen (multiple-MJUs only), and until transmission of the BER data. After the BER test terminates, the DSP engine continues to maintain the MJU branch in the selected state.

You can release of all selected branches in a multiple MJU path when there is one second of idle code. Perform this using Release All. You can not release a branch of a single MJU if there was access through multiple MJUs.

For maintenance purposes, it is desirable to block branches. A blocked branch can not transmit data to the control leg. The DTH can block any leg of the MJU and unblock it later. Do this using Block and Unblock. Unblock All unblocks all blocked branches on all MJUs downstream from the test access point. Block and Unblock operate on the last branch selected. Refer to Figure 5-5.

**Figure 5-5**
**MJU Control screen**




## Entering parameters for MJU control

Specify three parameters for MJU control:

- Rate - the rate at which you want to perform the test, either:
  - DS0A 2.4 kb/s
  - DS0A 4.8 kb/s
  - DS0A 9.6 kb/s
  - DS0A 56 kb/s
- Operation - the operation to perform on the branch, either:
  - Select branch - select the target branch
  - Release all - release all selected branches
  - Block selected branch - block the target selected branch
  - Unblock branch - unblock the target branch
  - Unblock all - unblock all the blocked branches
  - BERT - move to BERT Parameters Entry screen
- Branch - the branch (1 to 4) of the MJU on which you want to perform an operation.

After selecting a branch, it returns its hub identification to the DTH. This information appears on the same screen and allows you to keep track of the last MJU configuration.

To perform MJU control:

1. On the Menu of DTH Options, select Digital Tests and Monitoring.
   *The Digital Tests and Monitoring appears.*
2. Select the MJU Control option.
   *The MJU Control screen appears.*
3. Select the parameters, and choose the **`Execute`** softkey.

When the MJU operations for a channel are complete, terminate the operation using the Abort Activity softkey. You must do this because the test engine remains connected to the MJU to maintain branch selection.

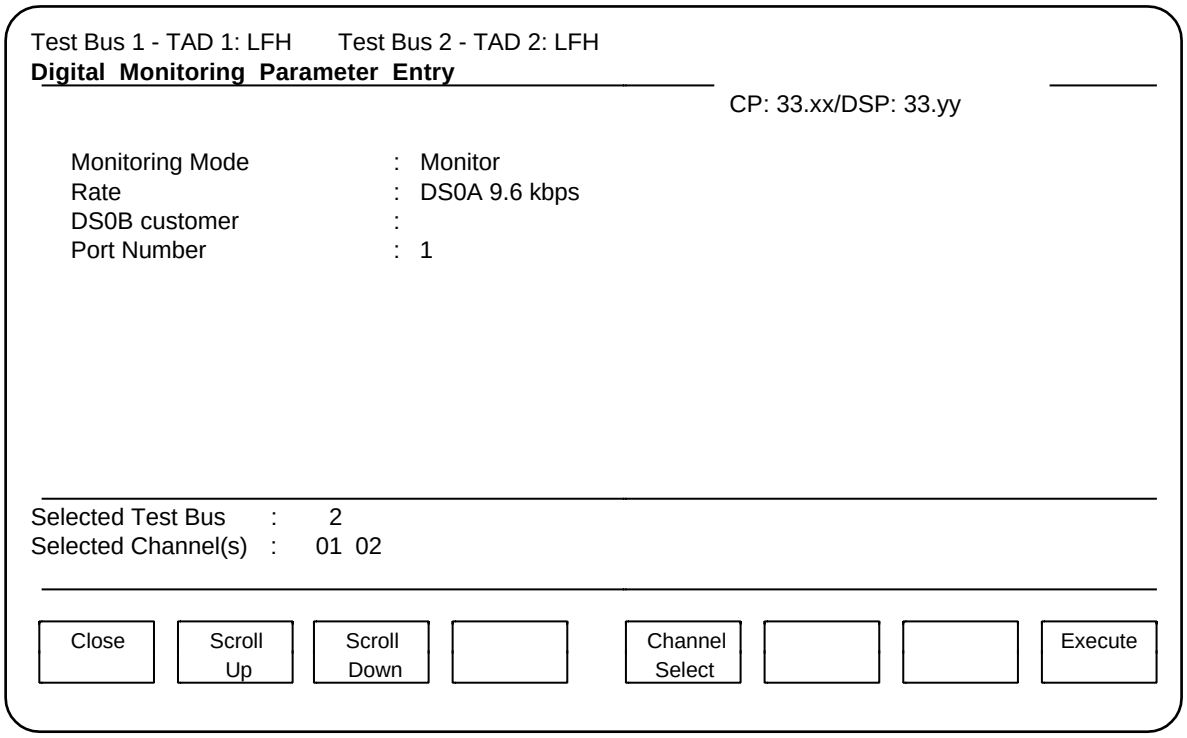
## Digital loopback

Digital loopback allows you to have the DTH attempt to place a digital loopback for signaling bits on the specified TAD and channels. You can request digital loopback for up to 24 channels. If the attempt to loopback is successful, the message ‘Test in Progress’ appears.

## Digital monitoring

You can monitor the digital data communications on a channel when the Data Voice Monitoring (DVM) card is present. The DDS data rates that you can monitor are DS0A at 2.4, 4.8, 9.6 and 56 kb/s, DS0B at 2.4, 4.8 and 9.6 kb/s and DS0 at 64 kb/s. For testing or to be in loopback mode, the channels must be idle or be allocated to the user issuing the test command.

**Figure 5-6**
**Digital Monitoring Parameter Entry screen**




## Entering parameters for digital monitoring

You need to enter the following parameters for digital monitoring:

- Monitoring mode - the monitoring mode for the chosen channel(s). The selections are:
  - — Monitor - two receive signals on two channels
  - — Split - one receive and one transmit signals on the same channel
- Rate - the DDS circuit and the rate of the channel for the digital monitoring. The selections are:
  - — DS0A 2.4 kb/s - 2.4 kilobits per second on a DS0A
  - — DS0A 4.8 kb/s - 4.8 kilobits per second on a DS0A
  - — DS0A 9.6 kb/s - 9.6 kilobits per second on a DS0A
  - — DS0A 56 kb/s - 56 kilobits per second on a DS0A
  - — DS0B 2.4 kb/s - 2.4 kilobits per second on a DS0B
  - — DS0B 4.8 kb/s - 4.8 kilobits per second on a DS0B
  - — DS0B 9.6 kb/s - 9.6 kilobits per second on a DS0B
  - — DS0 64 kb/s - 64 kilobits per second on a DS0

— DS0B customer - the DS0B customer of interest when performing monitoring on a DS0B circuit. The valid range depends on the rate. Port number - the Monitor card data port number. There are four data ports, 1 - 4.

To perform digital monitoring:

1. Select a TAD and channel. If you are performing a split activity, you must specify only one channel. If starting a monitor activity, you must specify two contiguous channels.

   *The Digital monitoring parameter entry screen appears.*

2. Select the parameters, and choose the **`Execute`** softkey.

# Analog Tests and Monitoring

Access the Analog Test and Monitoring menu (Figure 6-1) through the Menu of DTH Options. The procedures in this chapter assume that you are starting from the Analog Tests and Monitoring menu. If you are not, go back to the Menu of DTH Options by pressing the **Close** softkey until the menu appears. Then select Analog Tests and Monitoring.

To exit a test and return to the Menu of DTH Options, press the **Close** softkey from any parameter entry or results screen.

## Analog Tests and Monitoring screen

For all the tests in this screen, select a channel unit type. There are three main types of commands available from this screen:

- test commands
- stimuli commands
- signaling commands

### Analog test commands

The analog test commands are:

- Frequency & Level
- Gain Slope
- Peak to Average Ratio (PAR)
- Non-Linear Distortion
- C-Notched Noise
- C-Message Noise
- 3-kHz Flat Noise
- Return Loss
- Transients
- Phase Jitter

### Stimuli commands

These are the stimuli commands:

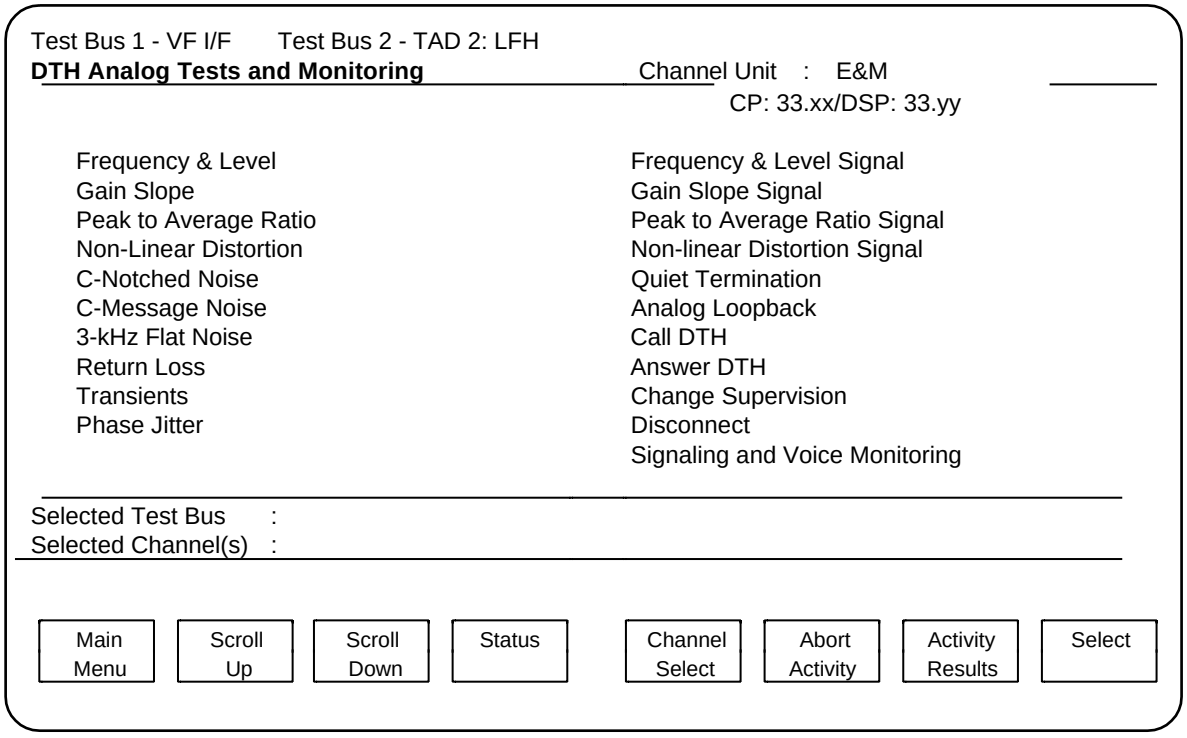
- Frequency & Level Signal
- Gain Slope Signal
- PAR Signal
- Non-Linear Distortion (NLD) Signal
- Quiet Termination
- Analog Loopback

### Signaling commands

The signaling commands are:

- Call DTH
- Answer DTH
- Change Supervision
- Disconnect

**Figure 6-1**
**DTH Analog Tests and Monitoring menu screen**




Use the channel unit you chose on line 2 for the tests run from this screen. The possible channel unit fields are: SAO, SAS, FXO, FXS, E&M, TO, ETO, DPO, SDPO, DPMO, DPT, RSCO, PLR, LSXO, DX. The default is E&M.

## Frequency and Level test

A Frequency and Level test is a measurement of the power level in dBm, and frequency of the received signal. The DTH performs the frequency measurement with a phase-locked-loop. The test engine then performs a level measurement by calculating an RMS running sum on the unfiltered input.

The following test results are returned:

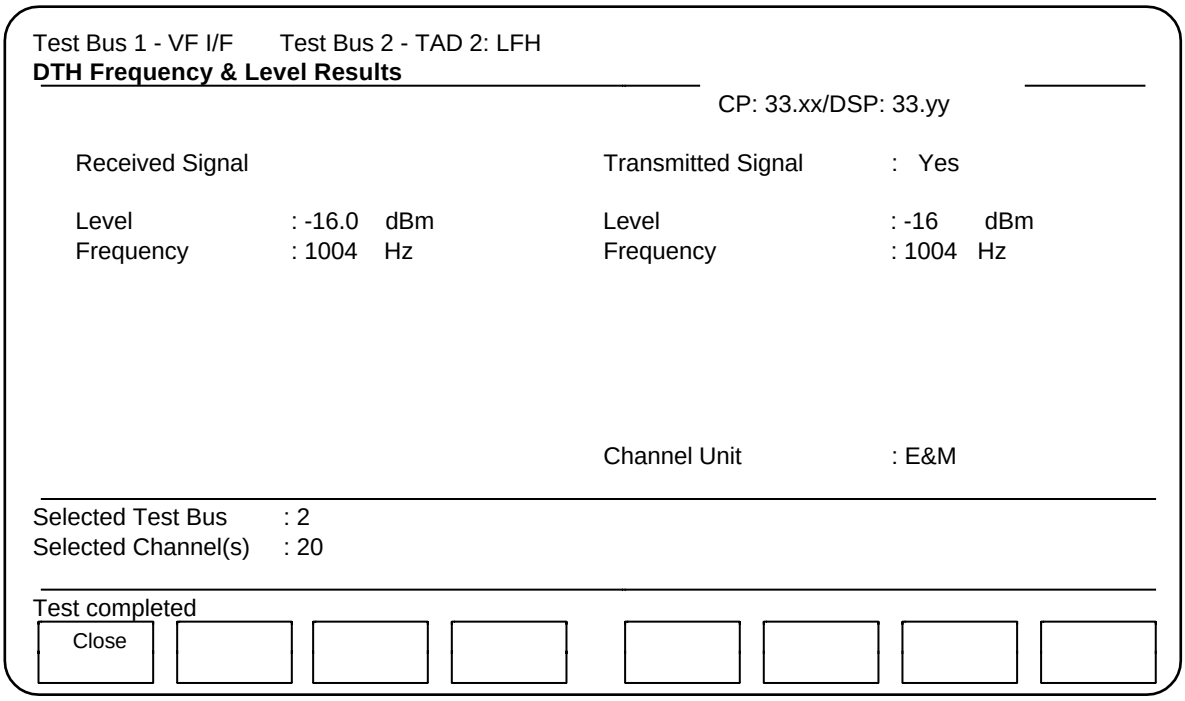
- RMS running sum of the pass-band signal
- high and low order word raw result of the frequency

The DTH converts the RMS running sum into the power of the signal (dBm units), and the frequency raw result into Hz.

To perform a Frequency and Level test:

1. Highlight Frequency and Level and choose the **`Select`** softkey.
   *A 'Do you need to generate a signal? (Y/N):' message appears.*
2. If you select N:
   *The DTH initiates the test, and displays the results screen without the transmitted signal parameters.*
3. If you reply with Y:
   *A second message: 'Enter desired frequency 304 -> 3504 Hz)' appears.*
4. Enter the frequency and press **`Return`**.
   *Another message: 'Enter desired level (40 -> 3 dBm)' appears:*
5. Enter the level and press **`Return`**.
   *The results screen appears. (refer to Figure 6-2)*

**Figure 6-2**
**Frequency & Level Results screen**




### Test results

The following results appear on the screen:

- level - in dBm
- frequency - in Hz

The level and frequency of the transmitted signal appear only if you transmit a signal.

## Gain Slope test

This measurement is made to ensure VF transmission quality. It yields roughly the frequency response of the circuit. Low frequency slope can affect voice quality, while excessive high frequency slope degrades speech intelligibility.

The differential losses between the result at 1004 Hz and those at 404 Hz and 2804 Hz are known as the slope at 404 and 2804 Hz respectively.

To transmit a signal, specify the power level of the signal (between -40 and +3 dBm with a step of 1 dBm, on the appropriate screen (Figure 6-1).

The measurement is essentially three level measurements, one at 404 Hz, one at 1004 Hz, and another at 2804 Hz. The detection threshold is set to -40 dBm per frequency.

Upon test completion, and once the three tones are detected and measured properly, the RMS running sums for 404, 1004, and 2804 Hz results are given, which are then converted into power levels (dBm).

This procedure shows how to perform a Gain Slope (attenuation distortion) test. Figure 6-3 shows the results screen.

To perform a Gain Slope test:

1. Highlight Gain Slope and choose the **`Select`** softkey.

   *A 'Do you need to generate a signal'? (Y/N):' message appears.*

2. If you select N:

   *The DTH initiates the test, and displays the results screen without the transmitted signal parameters.*

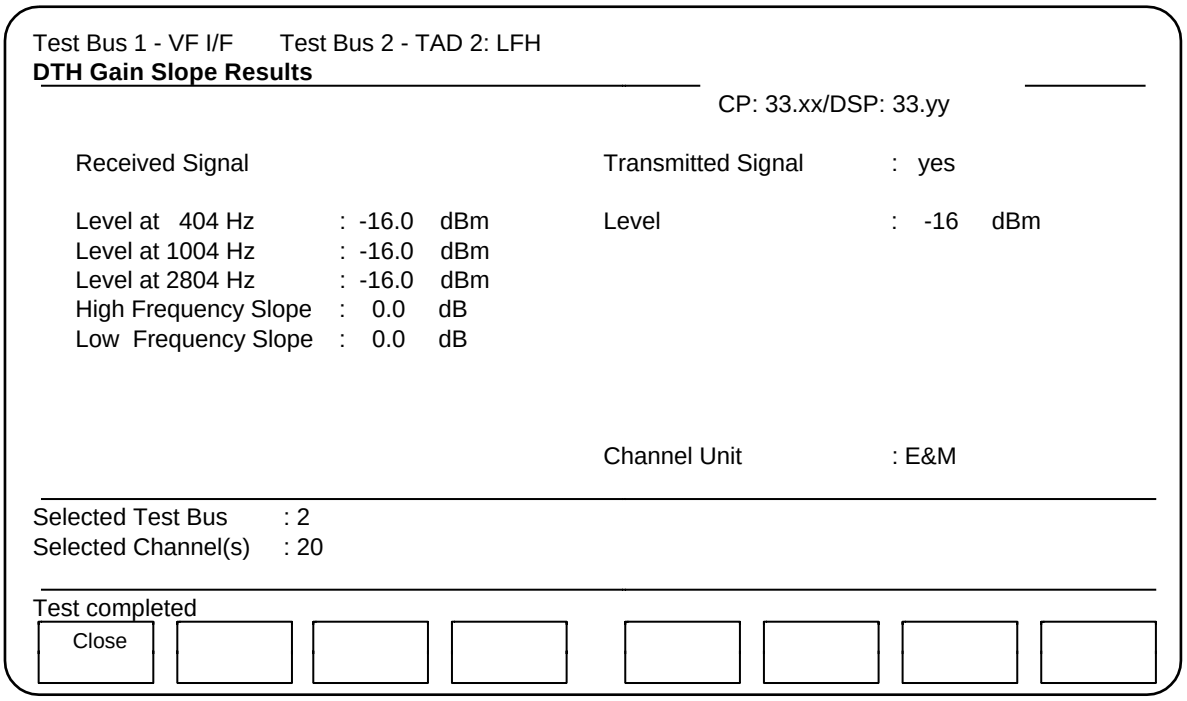
3. If you reply with Y:

   *The message: 'Enter desired level 40 -> 3 dBm):' message appears.*

4. Enter the level and press **`Return`**.

   *The results screen appears.*

**Figure 6-3**
**Gain Slope Results screen**




To do this test, provide a Gain Slope signal at the far-end.

### Test results

The following results appear on the screen:

- level at 404 Hz in dBm
- level at 1004 Hz in dBm
- level at 2804 Hz in dBm
- high frequency slope in dB (-40 through +3)
- low frequency slope in dB (-40 through +3)

## Peak-to-Average Ratio (PAR) test

Peak-to-Average Ratio (PAR) is a technique that measures channel dispersion (spreading in time of signal amplitude) due to transmission imperfections.

The input signal is weighted with the appropriate filter, then the DTH calculates the peak value and the full-wave rectified average value. It also calculates an RMS running sum of the received signal.

Due to the U-255 companding law and the PCM encoding, the total power of the received peak-to-average ratio waveform is restricted to -12 dBm total. Over that limit, the peak value is clipped.

Upon test completion, the DTH provides the:

- normalized peak value of the received waveform
- normalized full wave rectified average
- RMS running sum of the received signal

The following procedure explains how to perform the PAR test. You receive an indication of the PAR signal detection, along with PAR measurement in PAR units. Figure 6-4 shows the results screen.

To perform a PAR test:

1. Highlight Peak-to-Average Ratio, and choose the **`Select`** softkey.

   *A 'Do you need to generate a signal? (Y/N):' message appears.*

2. If you select N:

   *The DTH initiates test, and the displays results screen without the transmitted signal parameters.*

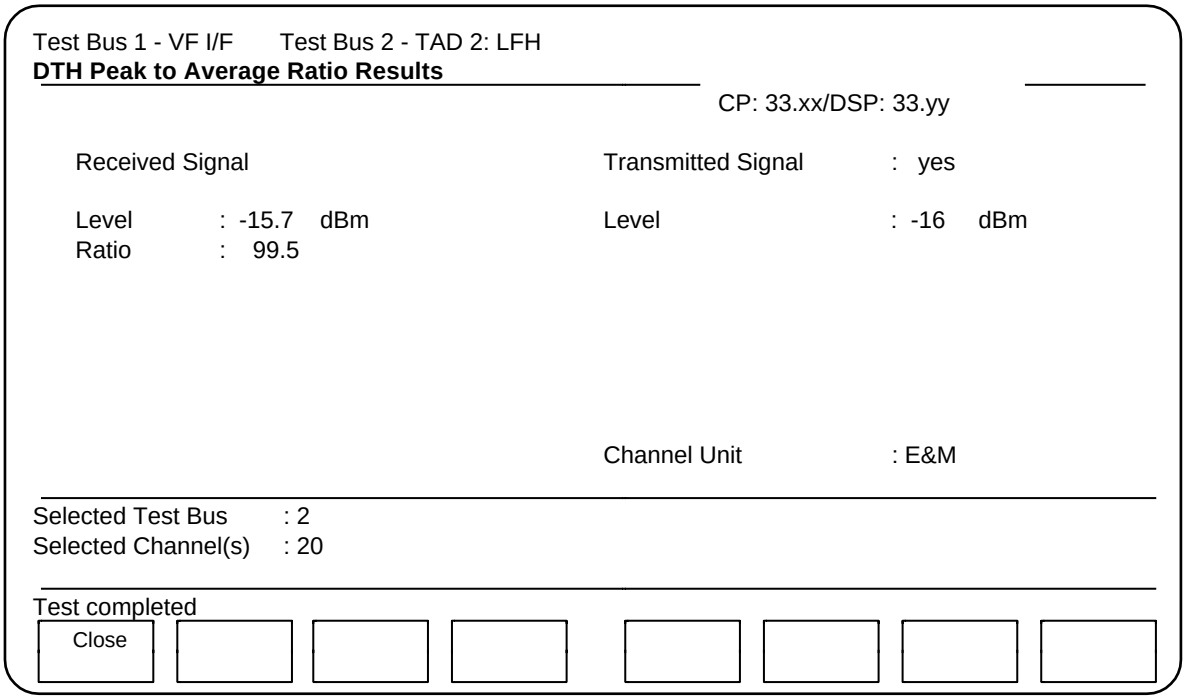
3. If you reply with Y:

   *A 'Enter desired level 30 -> - 12 dBm)' message appears.*

4. Enter the level and press **`Return`**.

   *The results screen appears.*

**Figure 6-4**
**DTH Peak-To-Average Ratio Results screen**




### Test results

The following results appear on the screen:

- Level - adequate levels are in the range -30 to -12 dBm
- Ratio - in PAR units (0 through 120), the desired result is 100 units.

## Non-Linear Distortion (NLD) test

A Non-Linear Distortion (NLD)test calculates the harmonic distortion generated by the transmission medium. Figure 6-5 shows the results screen.

To perform a Non-Linear Distortion test:

1. Highlight Non-Linear Distortion and choose the **`Select`** softkey.
   *A 'Do you need to generate a signal? (Y/N):' message appears.*
2. If you select N:
   *The DTH initiates the test, and displays the results screen without the transmitted signal parameters.*
3. If you reply with Y:
   *A 'Enter desired level -33 -> -3 dBm): message appears,*

4. Enter the level and press **`Return`**.
   *The results screen appears.*

The DTH uses the level of the 2-tone received signal to measure the amount of noise on the circuit. The it may not detect the 2-tone signal, or it may be out of range. In these cases, the 2-tone signal level shows as -84.0 dBm and the signal/noise ratios show as N/A. N/A means that the DTH can not compute field value. The level of the 4-Tone Received Signal measures the amount of non-linear distortion on the circuit. Generally the signal/noise ratio is higher than the signal/distortion ratio (the distortion level is greater than the noise level). The DTH computes the Second- and Third-Order Products using these ratios. If it detects a 2-tone signal, it corrects the 2nd and 3rd Order Products to eliminate the presence of noise in the initial readings. The correction factors range from 0 to 16.4 dBm.

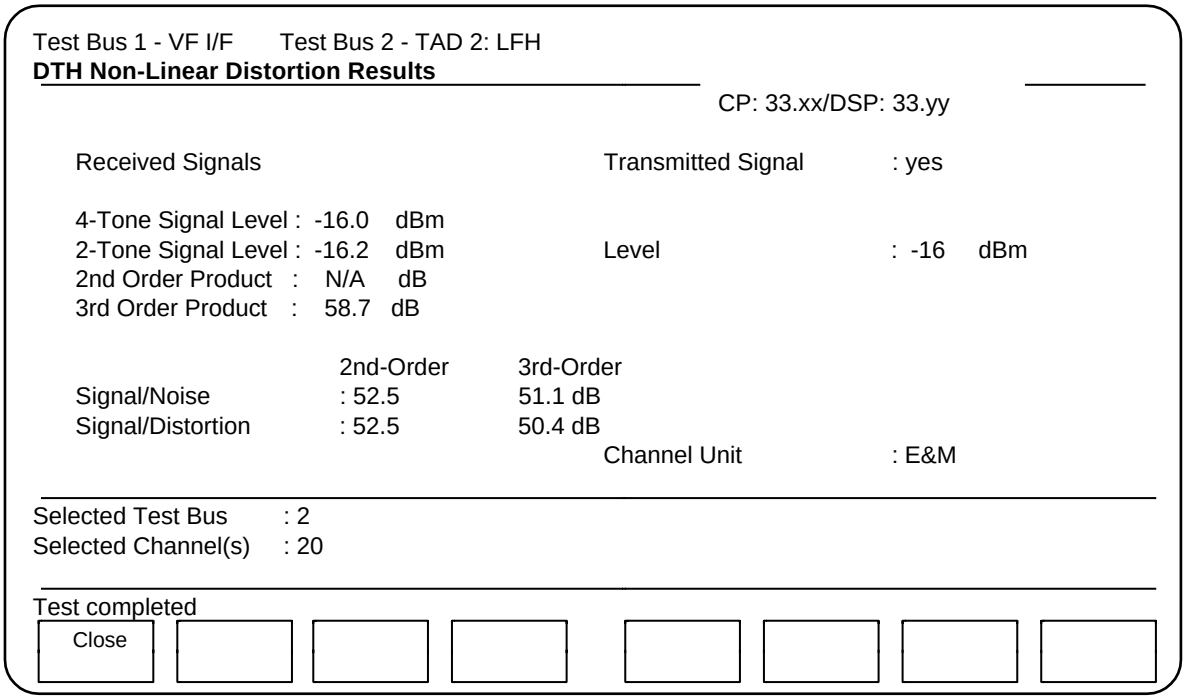
The signal/noise ratio can be smaller than or equal to the signal/distortion ratio, showing a noise level greater than or equal to the distortion level. Because the real distortion is lost in the background noise, accurate readings for distortion are impossible, and/or the 2nd and 3rd Order Products would indicate N/A to reflect this state.

This is not a continuous measurement but is a one shot test that lasts for approximately 2.5 seconds. Therefore, the information in the results reflects the distortion during a 2.5 second window.

Upon test completion, the DTH returns the following results:

- RMS running sum of the lower Second-Order product
- RMS running sum of the higher Second-Order product
- RMS running sum of the Third-Order product
- RMS running sum of the 860 Hz band
- RMS running sum of the 1380 Hz band

**Figure 6-5**
**Non-Linear Distortion Results screen**




### Test results

The following results appear on the screen:

- 4-Tone Signal Level in dBm
- 2-Tone Signal Level in dBm
- 2nd Order Product in dB (10 through 60)
- 3rd Order Product in dB (10 through 60)
- Signal/Noise for 2nd and 3rd Order Product in dB
- Signal/Distortion for 2nd and 3rd Order Product in dB

## C-Notched Noise test

Noise is the amount of power, that has no association with the signal of interest, that the channel conveys. The DTH uses a C-Message Weighting filter to measure the subjective annoyance to somebody listening to noise with a receiver.

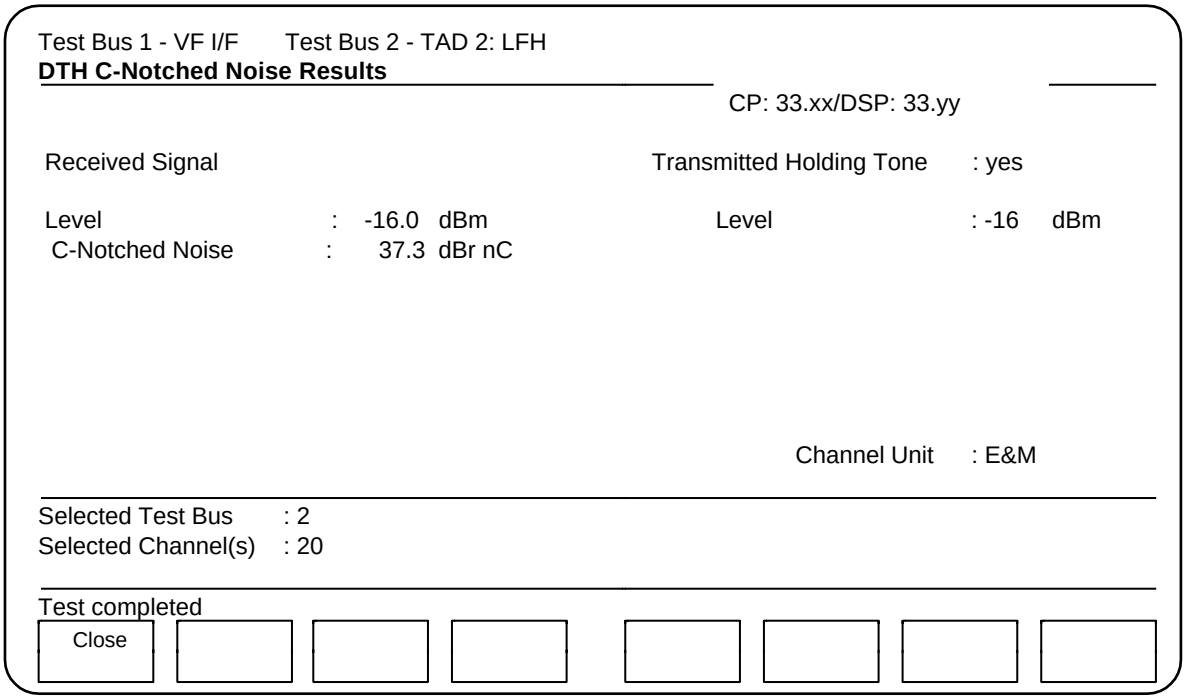
During a C-Notched Noise measurement, the DTH receives and suppresses a 1004 Hz holding tone. It then measures the power, in dBrnc, of the remaining signal after passing through a C-Message filter. This yields a figure of the noise introduced in the network.

This procedure explains how to do the C-Notched Noise test. Figure 6-6, shows the results screen.

To perform a C-Notched Noise test:

1. Highlight C-Notched Noise and choose the **`Select`** softkey.
   *A 'Do you need a holding tone? (Y/N):' message appears.*
2. If you select N:
   *The DTH initiates the test, and displays the results screen without the transmitted holding tone.*
3. If you reply with Y:
   *A 'Enter desired level (-40 -> +3 dBm):' message appears.*
4. Enter the level and press **`Return`**.
   *The results screen appears.*

**Figure 6-6**
**C-Notched Noise Results screen**




## Test results

The following results appear on the screen:

- Level in dBrn
- C-Notched noise in dBrnC (40 through 93)

- Transmitted Holding Tone, either Yes or No
- Holding Tone level in dBm

### C-Message Noise test

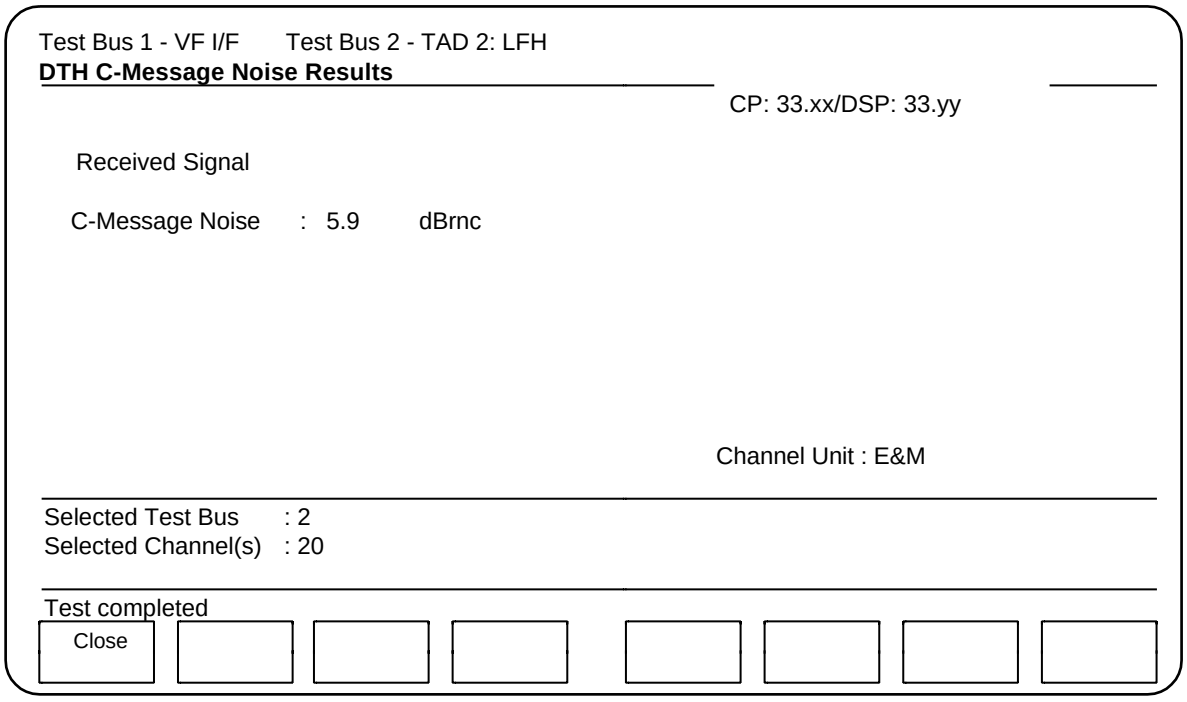
Noise is the amount of power the channel conveys by that has no association with the signal of interest. A C-Message weighting filter measures the subjective annoyance to somebody listening to noise with a receiver, Figure 6-7 shows the results screen.

Upon completion of the test, the RMS running sum of the noise and RMS running sum of the 1004 Hz holding tone results are given.

To perform a C-Message Noise test:

1. Highlight C-Message Noise and press the **`Select`** softkey.
   *The results screen appears.*

**Figure 6-7**
**C-Message Noise Results screen**




### Test results

The C-Message Noise in dBrnC results appear on the screen:

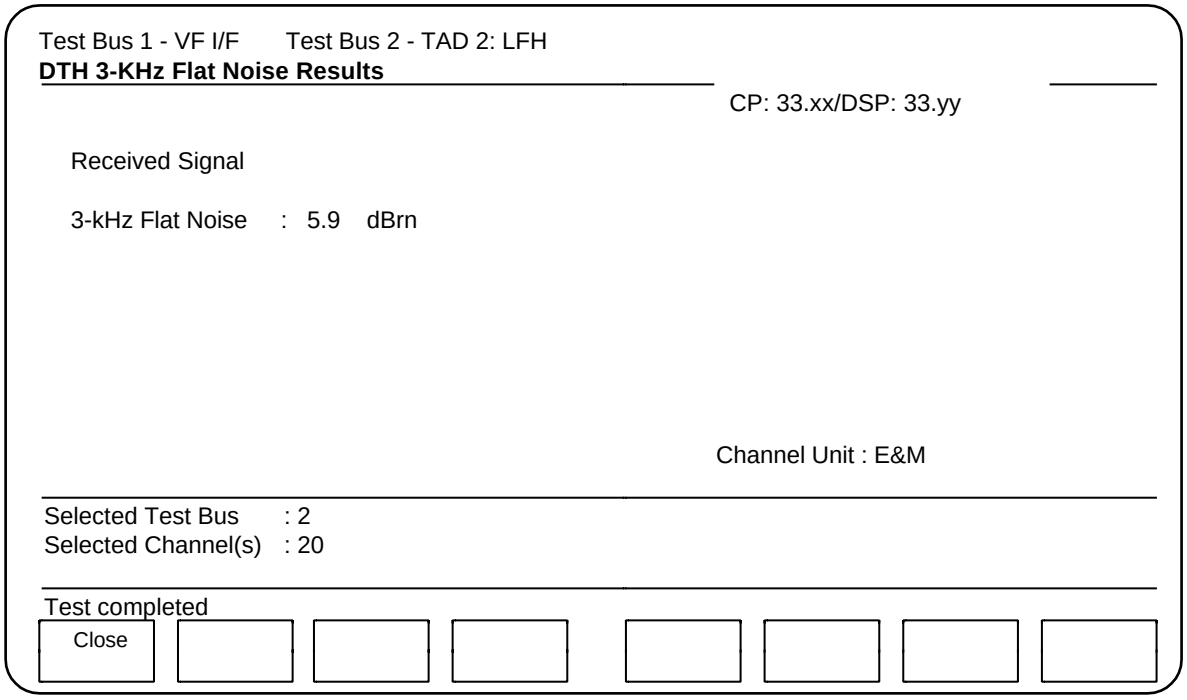
### 3-kHz Flat Noise test

Noise is the amount of power the channel conveys by that has no association with the signal of interest. During 3-kHz Flat Noise measurement, the DTH measures the background noise power, once filtered, through a 3 kHz low-pass filter. Figure 6-8 shows the results screen.

To perform a 3-kHz Flat Noise test:

1. Highlight 3-kHz Flat Noise and choose the **`Select`** softkey.
   *The results screen appears.*

**Figure 6-8**
**3-kHz Flat Noise Results screen**




### Test results

The following results appear on the screen:

- 3-kHz Flat Noise in dBrn

### Return Loss test

A Return Loss test consists of three measurements:

- echo return loss
- singing return loss low
- singing return loss high

Each of these measurements calculates the ratio of the power of the transmitted signal to the power of the received signal.

The received signal is known as the echo or singing signal. The other end of the circuit must apply quiet termination during the measurement.

When the test is complete, the DTH receives the following:

- RMS running sum of the Received Signal Echo Return Loss
- RMS running sum of the Received Signal Singing Return Loss Low
- RMS running sum of the Received Signal Singing Return Loss High
- The DTH converts the RMS running sum into a power level, and derives the loss with respect to the level of the transmitted signal.

Figure 6-9 shows the results screen.

To perform a Return Loss test:

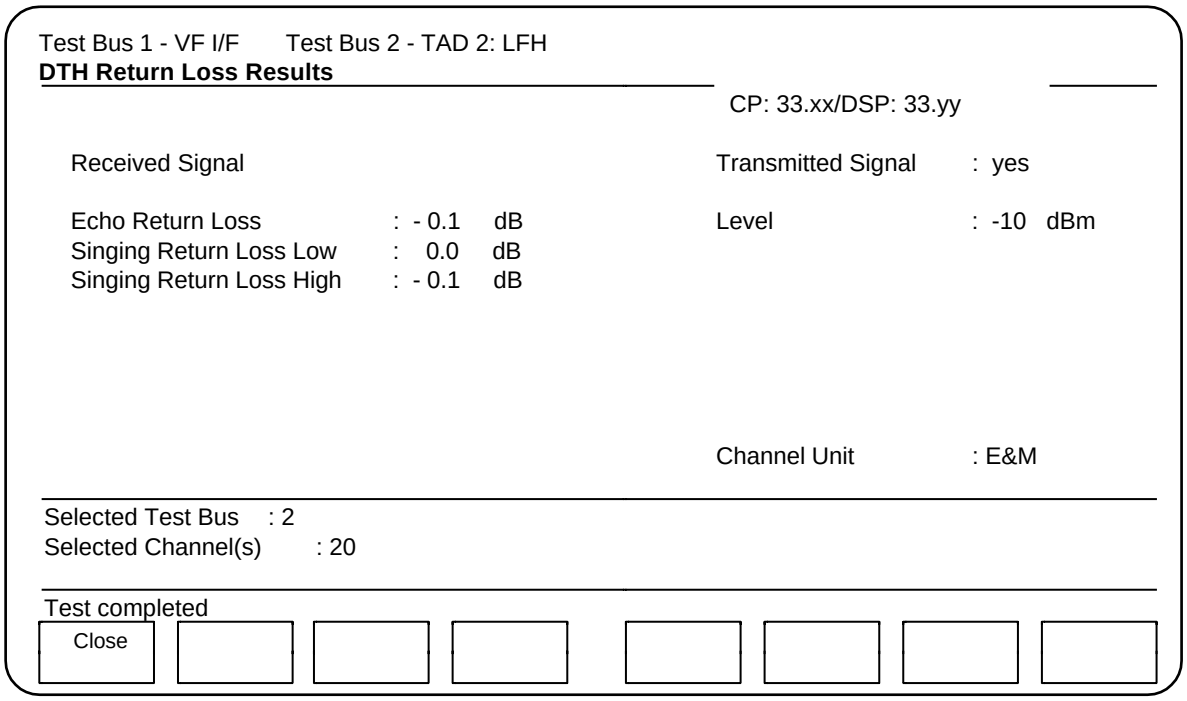
1. Highlight Return Loss and choose the **`Select`** softkey.
   *A 'Enter signal level (- 10 -> -2 dBm):' message appears.*
2. Enter the desired level and press **`Return`**.
   *The results screen appears.*

For the Echo Return Loss test, the DTH sends a signal and measures the level of the returned signal. It returns the power ratio in dB between the transmitted and received signals.

For the Singing Return Loss test, the DTH returns two results:

- Singing Return Loss Low (corresponding to the singing of the lower edge of the voice band)
- Singing Return Loss High (corresponding to the upper edge of the voice band)

**Figure 6-9**
**DTH Return Loss Results screen**




Before transmitting a signal, specify its power level (-10 to -2 dBm). To perform this test, provide a quiet termination signal at the far-end.

### Test results

The following results appear on the screen:

- Echo Return Loss in dB (-13 to 58 dB)
- Singing Return Loss Low in dB (-13 to 58 dB)
- Singing Return Loss High in dB (-13 to 58 dB)

## Transients test

This test consists of the following measurements:

- Impulse Noise
- Gain Hits
- Phase Hits
- Dropouts

on a single channel. The DTH measures the transients in the presence of a 1004 Hz holding tone. To ensure that hit and drop out counter have protection

against low-frequency noise, and noise at the upper end of the voice band, the DTH uses a front-end bandpass filter which passes energy near 1 kHz.

You can set the blanking rate, from which the DTH derives the blanking interval. The blanking interval is the minimum delay between counts of two events of the same type (for example, two phase hits).

The detection of a dropout blocks the counting of hits or impulse noise for a time beginning when the dropout is first qualified, and ending one second after the dropout ends. It counts simultaneous gain and phase hits in the absence of dropout.

A qualification interval (about 4 ms) avoids counting individual cycles of a damped oscillation impulse. The DTH only counts those phase hits, gain hits, and dropouts that exceed their threshold for longer than the qualification interval. For each transient measurement, the DTH shows the results measured for that second. Figure 6-11 shows the results screen.

It has information on the current state of the:

- three impulse counters
- three gain counters
- phase counter
- dropouts counter

To perform a Transients test:

1. Highlight Transients and choose the **`Select`** softkey.
   *The Entry screen appears.*

2. Enter the desired values and choose the **`Execute`** softkey.
   *The results screen appears.*

### The test's parameters

When you select the Transients option, the Transients Test Parameters Entry screen appears (Figure 6-10). The test's parameters are:

- Impulse or Gain Threshold 1, 2, 3 - the impulse threshold must be greater than 30 dBmC, and less than, or equal to, 93 dBrnC. The gain threshold must be greater than, or equal to, 2 dB and less than, or equal to, 10 dB.
- Phase Threshold - the phase threshold in degrees. Can be either 5, 10, 15, 20, 25, 30, 35, 40, or 45 degrees.
- Counting Rate - using the scroll keys, select the counting rate expressed in units or 125 microsec. increments. You can select either 4, 8, 16, 50, or 100 counts per second.
- Duration - the tests duration. The format is add hh:mm:ss where:

— d is the number of days

— hh is the hour

— mm is the minutes

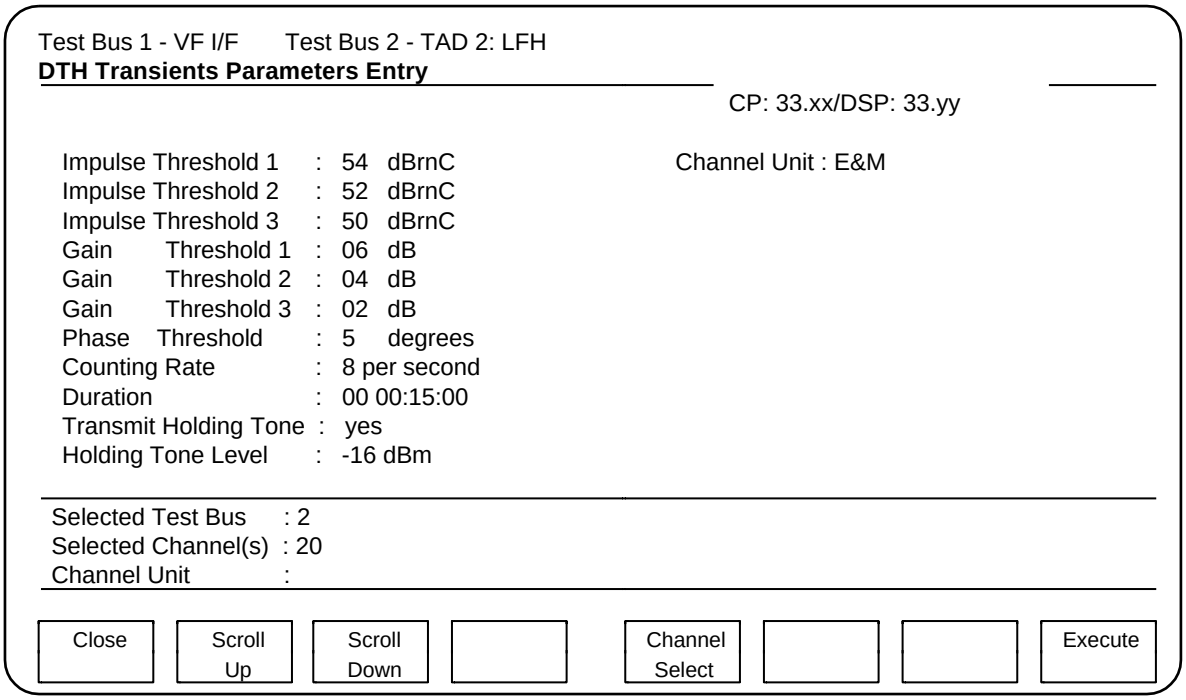
— ss is the seconds

Enter only digits in this field, do not enter the separator (:). The maximum duration is 9 days, 23 hours, 59 minutes, 59 seconds (09 23:59:59), and it must be greater than zero. The default duration is fifteen minutes.

- Transmit Holding Tone - to send a Holding Tone, enter Yes; otherwise enter No.
- Holding Tone Level - the level of the Holding Tone the DTH transmits. The tone's range is -40 to +3 dBm.
- Channel Unit - the channel unit

***Note:*** You can check the status of the test at any time.

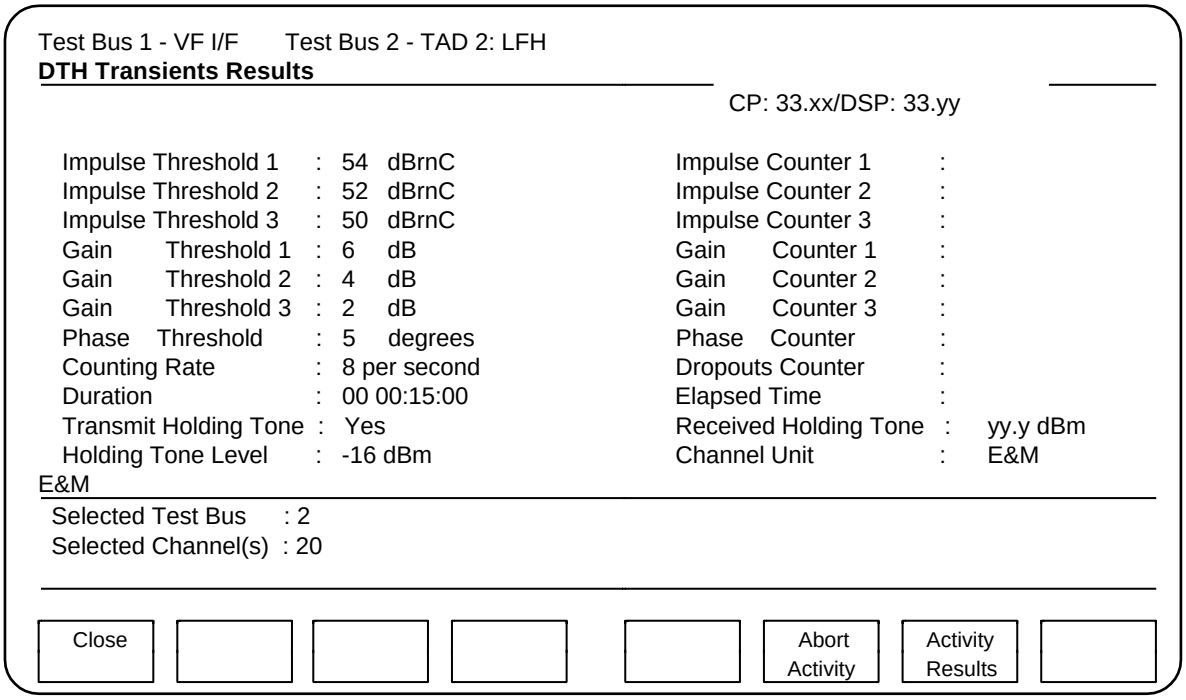
**Figure 6-10**
**Transients Test Parameters Entry screen**




## Displaying Transients results

This procedure explains how to display the DTH Transients Results screen, shown in Figure 6-11.

**Figure 6-11**
**DTH Transients Results screen**




### Test results

The following results appear on the screen:

- Input parameters - for the test, as on the Parameters Entry screen
- Impulse and Gain Counters 1, 2, 3 - the counts for the three levels
- Dropouts Counter - dropout rate result for the corresponding Counting Rate field. A dropout occurs when the loss of the received signal increases by 12 dB or more compared to the level at the start of the measuring interval. The DTH counts Dropouts when the level of the holding tone decreases for a period of time longer than the qualification interval.
- Elapsed Time - elapsed time since the start of the test
- Received Holding tone - received holding tone result for the corresponding Transmitted Holding Tone field

If the test is not complete, select the **`Activity Results`** softkey to update the results.

## Phase Jitter test

This test measures the amount of incidental phase modulation present in the system. This disturbing effect causes the zero-crossing of a signal to jitter.

The DTH can measure the peak-to-peak Phase Jitter of a 1004 Hz holding tone. Part of the measurement can be due to the background noise.

This is not a continuous measurement. It is performed in one shot that lasts for approximately four seconds. Therefore, the information in the results reflects the average of the peak-to-peak jitter during the four second window.

The peak-to-peak Phase Jitter, and the RMS running sum of the holding tone are shown in the results screen (Figure 6-12).

To perform a Phase Jitter test:

1. Highlight Phase Jitter and choose the **`Select`** softkey.

   *YA 'Do you need a holding tone? (Y/N):' message appears.*

2. If you select N:

   *The DTH initiates the test, and displays the results screen without the transmitted holding tone.*

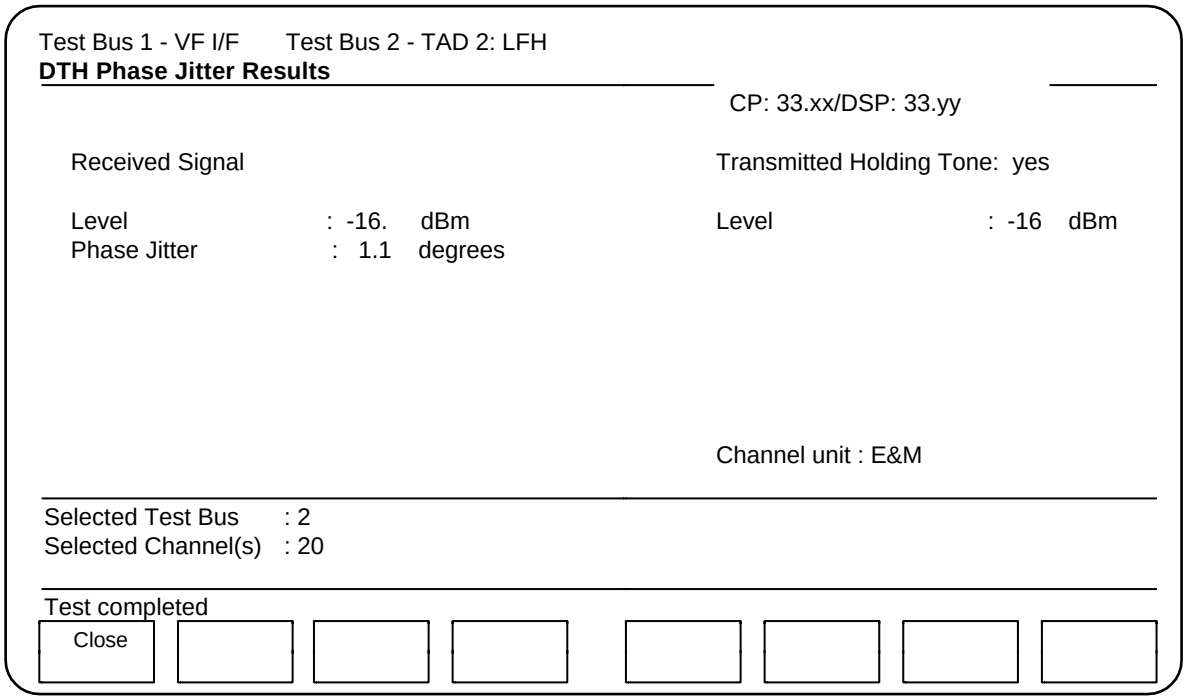
3. If you reply with Y:

   *A 'Enter desired level (-40 -> +3 dBm) message appears:'*

4. Enter the level and press **`Return`**.

   *The results screen appears.*

**Figure 6-12**
**DTH Phase Jitter Results screen**



### Test results

The following results appear on the screen:

- Received Signal Level in dBm
- Phase Jitter in degrees
- Transmitted Holding Tone, either yes or no
- Transmitted Holding Tone Level, in dBm

## Stimuli commands

Place a stimulus on a single channel, after you put it in the idle or connected state. A stimulus remains until you abort or an error occurs, such as loss of signal on the TAD.

The stimulus options are:

- Frequency & Level Signal - the DTH places a signal with the level and frequency you chose on the channel. The level ranges from -40 to +3 dBm, in 1 dB steps. The frequency ranges from 304 to 3504 Hz, in 1 Hz steps.
- Gain Slope Signal - the DTH places a gain slope signal, for which the frequency component level is selectable in the range -40 to +3 dBm, in 1 dB steps, on the channel.
- Peak-to-Average Ratio (PAR) signal -the DTH places a PAR signal with a selectable level in the range -30 to - 12 dBm, in 1 dB steps, on the channel.
- Non-Linear Distortion (NLD) signal - the DTH places an NLD signal on the channel. The signal level is selectable in the range -3 to -33 dBm, in 1 dB steps.
- Quiet Termination - the DTH places a quiet termination is placed on the channel.
- Analog Loopback - you can apply analog loopback to only on one channel. It does not loopback the signaling bits.

### Selecting a stimulus

To select a stimulus:

1. On the Analog Tests and Monitoring screen, select the desired stimulus.

   *Depending on the stimulus you chose, the DTH attempts to place the stimulus on the channel or requests more information.*

2. Once the stimulus is no longer required, choose the **`Abort Activity`** softkey to stop the stimulus.

# Signaling commands

## Call DTH

Use the Call DTH command to place a call on a previously specified idle channel. When you select ‘Call DTH’, you are prompted for the up to 20-digit telephone number (a ‘-' is used as a one second pause) and dialing class. Signaling information is taken from the channel configuration table. This command is accepted if the channel is idle or allocated. Error messages appear for system problems.

Switch-provisioned channels use MF dialing. Analog-provisioned channels use either DTMF or DP dialing.

**Table 6-1**
**ASCII dial code assignments**

| Keyboard key | DTMF code | MF code | DP/SF code |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |
| A | A | Ring back | invalid |
| B | B | code 12 | invalid |
| C | C | KP1 | invalid |
| D | D | KP2 | invalid |
| * | * | ST | invalid |
| # | # | invalid | invalid |
| - | one second | one second | one second |

***Note:*** The called directory number must be in answer mode, or you receive the error message: 'Call could not be completed; time-out'. After establishing a connection, both channels enter Connected mode.

To use the Call DTH command:

1. Select Call DTH.

   *The 'Enter dial class (O=MF, I=DTMF, 2=DP, 3=SF):' prompt appears.*

2. Press **`Return`**.
3. Enter the dialing class.

   The *'Enter start dialing scheme (O=LS, I =GS, 2=DD, 3=WS, 4=1D):' prompt appears.*

4. Press **`Return`**.

   *The 'Enter phone number' (up to 20 digits)' prompt appears.*

5. Enter the number and press **`Return`**.
6. The DTH attempts to place the call.

### Answer DTH command

The Answer DTH command places a channel in the answer mode. You must enter the TAD and channel parameters. Signaling information comes from the channel configuration table. The channel must be idle or allocated. You must also specify the channel unit type.

### Change Supervision

The DTH prompts for the next supervision state. It can be either:

- Busy - the supervision changes to off-hook or busy. The channel should be idle or ringing.
- Idle - the supervision changes to on-hook or idle. The channel should be in the Connected or Ringing state before issuing this command.
- Ring - the supervision changes to ringing if the channel unit supports
- Seize - the supervision changes to Seize if the channel unit supports it.

Reply to the prompt, and press **`Return`**; a 'Supervision changed' message appears.

The channel can be idle, allocated, or connected.

### Disconnect command

Disconnect disconnects a connected channel, and changes its supervision to on-hook. (A channel is connected when the Answer and Call commands establish the call.) You must disconnect Both ends need. Use this command to disconnect a channel after performing a series of tests. Disconnect requires the TAD and channel parameters.

## Signaling and Voice Monitoring

The DTH allows you to do signaling and voice monitoring on a DS0 channel. It supports two operation modes, monitor or split. Both modes allow you to dial-up a remote device/person (call back). The entry screens are shown in Figure 6-13, and Figure 6-15.

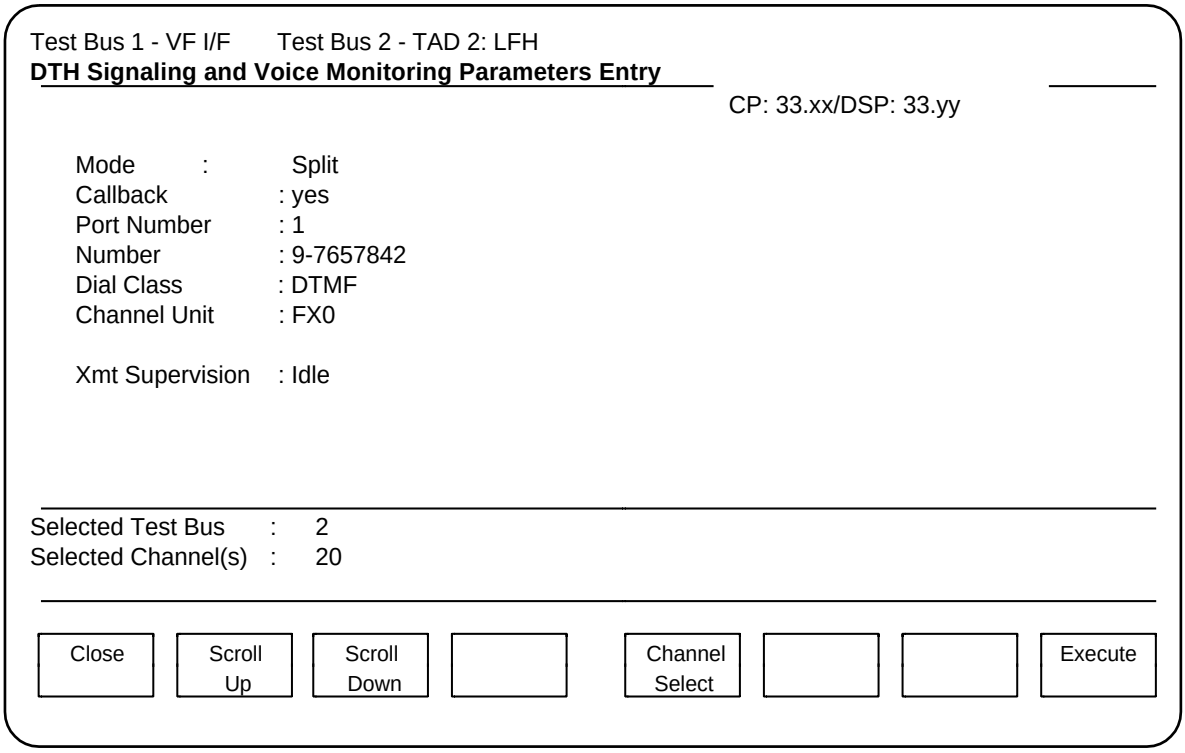
- Monitor - bridge the DTH on a DS0 channel through the Digital Cross Connect (DCC). You can listen to each direction of a channel (two-way monitor).
- Split - both ends of a split DS0 channel terminate on the DTH. You can then access either end of the split DS0 channel.

During on-line voice monitoring, you have access to these functions:

- Monitor supervision - supervision on the DS0 channel(s) is always monitored. Available for both monitor and split mode. It also detects winks.
- Change supervision - the DTH can change supervision on the transmit side of a DS0 channel. Available only in split mode.
- Outpulse digits - the DTH outpulses digits on a terminated DS0 channel. Available only in split mode.
- Send Wink - the DTH sends a wink on the transmit side of the DS0 channel. Available only in split mode.
- Capture digits - the DTH captures dialed digits of all kinds (MF, DTMF, DP, and SF) on the receiving side of a DS0 channel. Available for monitor and split modes.

The channel may be connected and/or allocated to the user giving the test command. It must be idle before issuing the command. The stimuli on the channel remains until you abort the test, or until the DTH detects a fatal system error.

**Figure 6-13**
**Signaling and Voice Monitoring Parameter Entry (split mode) screen**




To perform signaling and voice monitoring:

1. Highlight Signalling and Voice Monitoring.

   *The Entry screen appears.*

2. Enter the appropriate parameters as outlined in “Signaling and Voice Monitoring parameters”.
3. Choose the **`Execute`** softkey.

   *The appropriate Monitoring Activity screen appears.*

## Signaling and Voice Monitoring parameters

These are the Signaling and Voice Monitoring parameters:

- Mode - the voice monitoring mode of interest, either:
  - — Split (default)
  - — Monitor

  ***Note:*** If you change the monitoring mode to monitor mode, the Signaling and Voice Monitoring Parameter Entry (Monitor) screen (Figure 6-16), appears and becomes the current Signaling and Monitoring Parameter Entry. In this case, the monitor mode becomes the default configuration.

Otherwise, the Signaling and Voice Monitoring Parameter Entry (Split) screen (Figure 6-14, remains and you can continue to select parameters.

- Callback - whether or not there is a need for a connection with a remote device
- Port Number - one of the four DTH ports
- Number - the number to be dialed to access the remote device/person. You can enter up to 20 digits in this field.
- Dialing Class - can be DTMF or DP
- Channel Unit - the Channel Unit type
- Xmt Supervision - the initial transmit (Xmt) supervision state, either:
  - — Idle
  - — Busy
  - — Seize
  - — Ring

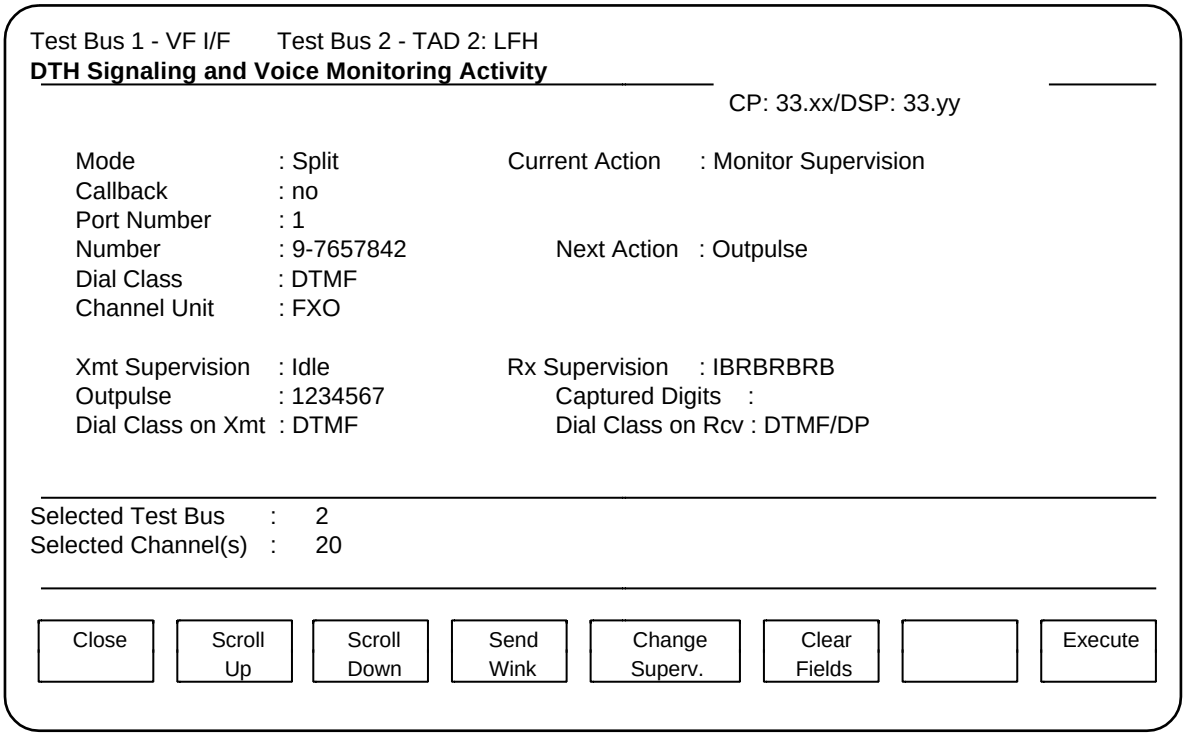
The supervision states Seize and Ring are available for only some of the channel units. If you select a transmit supervision state that does not exist for the selected channel unit, the following message appears:

*Request denied; Supervision undefined for channel unit specified.*

### Monitoring activity in split mode

The Signaling and Voice Monitoring Activity screen for split mode look like Figure 6-14.

**Figure 6-14**
**Signaling and Voice Monitoring Activity (Split mode) screen**




The Next Action field allows you choose from the following:

- Monitor Supervision (done in the background)
- Outpulse (digits)
- Capture digits

If you choose Outpulse, enter up to 20 digits in the Outpulse field, and select the **`Execute`** softkey.

Select the next Xmt Supervision state to be sent, which depends on the channel unit terminating the other end of the DS0 channel. By selecting the **`Change Supervision`** softkey, you can send one of the following supervision states on the transmit side:

- Idle
- Busy
- Seize
- Ring

You can select the Dial Class on the transmit side (Xmt). It can be DTMF, DP, MF, or SF.

Select the Dial Class on the receive side (Rcv). It can be DTMF/DP, MF, or SR Upon capturing digits, this field becomes a result field, displaying the actual received dial class.

Select either Monitor Supervision, Outpulse Digits, or Capture Digits at one time. You can Send Wink on the transmit side of the monitored channel and Change Supervision at any time by using the appropriate softkey. The supervision change is done according to the selected state in the activity screen.

The **`Clear Fields`** softkey clears the Captured Digits and Rcv supervision fields.

### Activity results

Once in the Signaling and Voice Monitoring Activity screen, you can not modify either these fields:

- Mode
- Callback
- Port number
- Number
- Dial class
- Channel unit

Select those parameters in the parameter entry screen. They appear on the Signaling and Voice Monitoring Activity screen for information purpose only.

The Current Action field shows the action the DTH is processing, typically the Monitor Supervision action mode. You can not access this field.

If you select Next Action as Outpulse, this field becomes Outpulse while outpulsing occurs. On completion of this activity, the field returns to the Monitor Supervision.

To change the supervision on the transmit side, select the desired Transmit Supervision state, and press the **`Change Supervision`** softkey. The Xmt Supervision state becomes the current one. You can send a wink and a supervision change at any time on the transmit side, without regard to the Current Action.

You can not access the Rx Supervision and Captured Digits fields. They display the received supervision states and captured digits. The DTH displays

the last 20 received supervision states and the last 20 captured digits. The following convention describes the Rx supervision field:

- I - Idle
- B - Busy
- S - Seize
- R - Ring
- W - Wink
- ? - Non-existing received supervision state for the channel unit you chose. This tells you that there is something wrong in the actual configuration.

While processing an activity such as Capture Digits or Outpulse, any change in the receive (Rx) supervision state and/or any detected winks appear in the Rx. supervision field. This is because the action of monitoring the received supervision is always done in background.

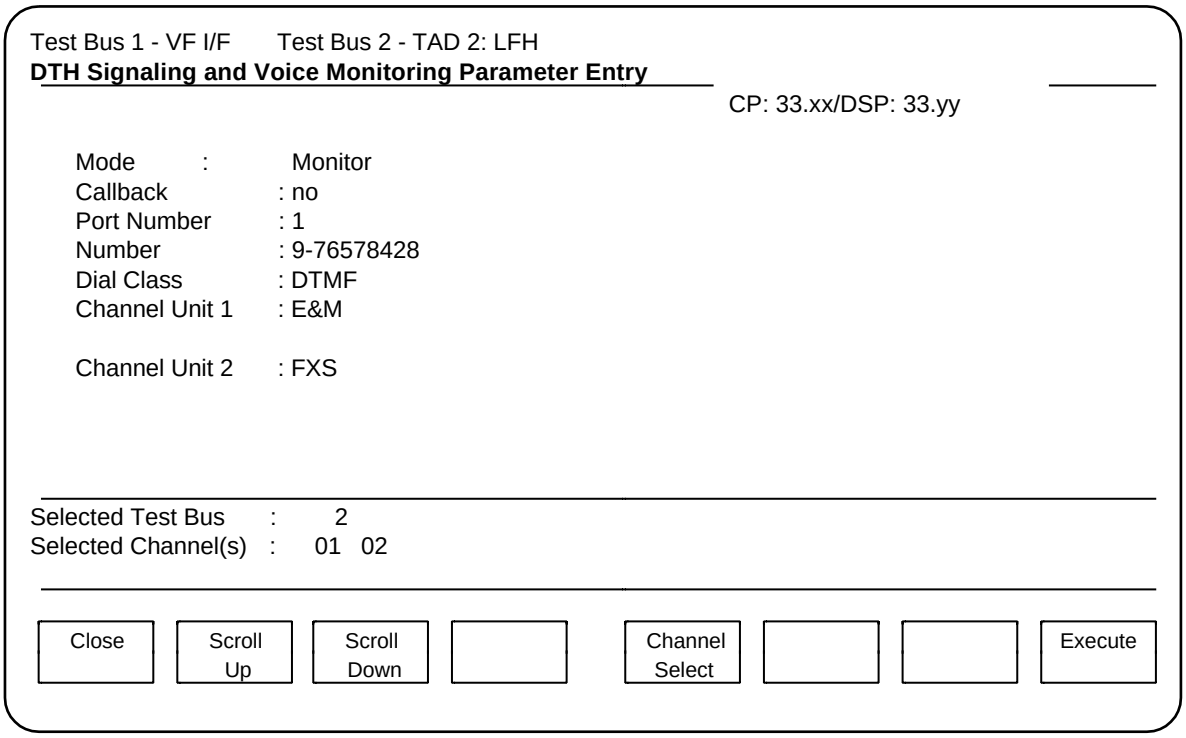
To return to Monitor Supervision, scroll the desired option when in the Next Action field. When you select the **`Execute`** softkey, the current mode becomes Monitor Supervision. Use the Monitor Supervision action to stop an activity such as Outpulse or capture digits.

To outpulse digits, select Outpulse in the Next Action field. Then, move to the Outpulse field and enter the list of digits you want to send on the transmit side. To modify the Dial Class on the transmit side, move to the Dial Class on Xmt field. Selecting the **`Execute`** softkey starts the process of outpulsing digits on the transmit side of the monitored channel.

To Capture Digits on the receiving side, select Capture Digits in the Next Action field. Then, move to the Dial Class on Rx field to select the dial class you expect on this receiving side.

Selecting DTMF/DP, means that the dial class on the receiving side could be either DTMF (Dual Tone Multifrequency) or DP (Dual Pulse). The DTH analyzes the first received digits, determines if the class is DTMF or DP, and displays the class in Dial Class on Rx.

**Figure 6-15**
**Signaling and Voice Monitoring Parameter Entry (monitor mode) screen**



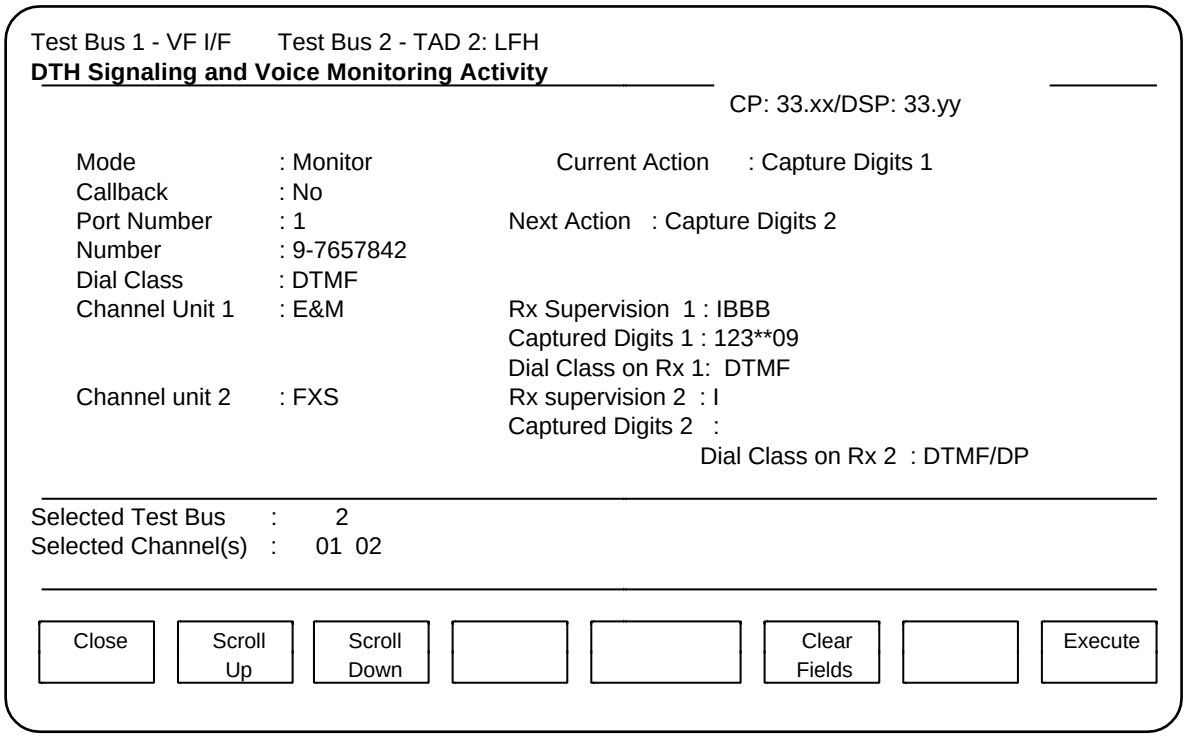

In monitor mode, the parameters remain the same as they are for split, except for the channel unit type fields. You can select two channel unit types to monitor.

> ***Note:*** If you change the monitoring mode to monitor mode, the Signaling and Voice Monitoring Parameter Entry (Monitor) screen (Figure 6-16), appears and becomes the current Signaling and Monitoring Parameter Entry. In this case, the monitor mode becomes the default configuration. Otherwise, the Signaling and Voice Monitoring Parameter Entry (Split) screen (Figure 6-14), remains and you can continue to select parameters.

## Monitoring activity in Monitor mode

The Signaling and Voice Monitoring Activity in Monitor Mode appears in Figure 6-16.

**Figure 6-16**
**Signaling and Voice Monitoring Activity (Monitor mode) screen**




While monitoring activity, you can change the Next Action field to be one of the following:

- Monitor Supervision
- Capture Digits 1 (capture on first selected channel)
- Capture Digits 2 (capture on second selected channel)

In monitor mode, there are no **`Send Wink`** or **`Change Supervision`** softkeys.

# DTH108 Test Line Call Origination

DTH 108 Test Line Call Origination is used to place a call on a TAD and channel to access the ADTT (Advanced Digital Trunk Testing) feature patch available on the DMS family of digital switches.

This functionality directs a DTH to carry out an inverted BERT on a specific trunk group member which terminates on a type 108 test line at a distant switch. The test line provides a digital loopback so that is tests both directions of the digital trunk. The DTH at the near-end (NE) switch originates the call, sets up the connection, and generates the bit pattern sent to the far-end (FE). The same DTH also measures the errors in the pattern looped-back from the FE. The screen has four fields where you can specify the:

1. type of test to be run, either Home Office Verification (78), Operational (Maintenance Busy Override), (18), or Transmission (08)
2. trunk under test's (TUTs) four-digit Trunk Group Number
3. TUT’s four-digit Trunk Group Member Number
4. phone number to reach the test line (eight digits maximum) (for Home Office tests, this field is left blank)

You can obtain each of these pieces of data from the BER Test Results.

If there is no VF I/F card, a single DS1 card handles both TADs.

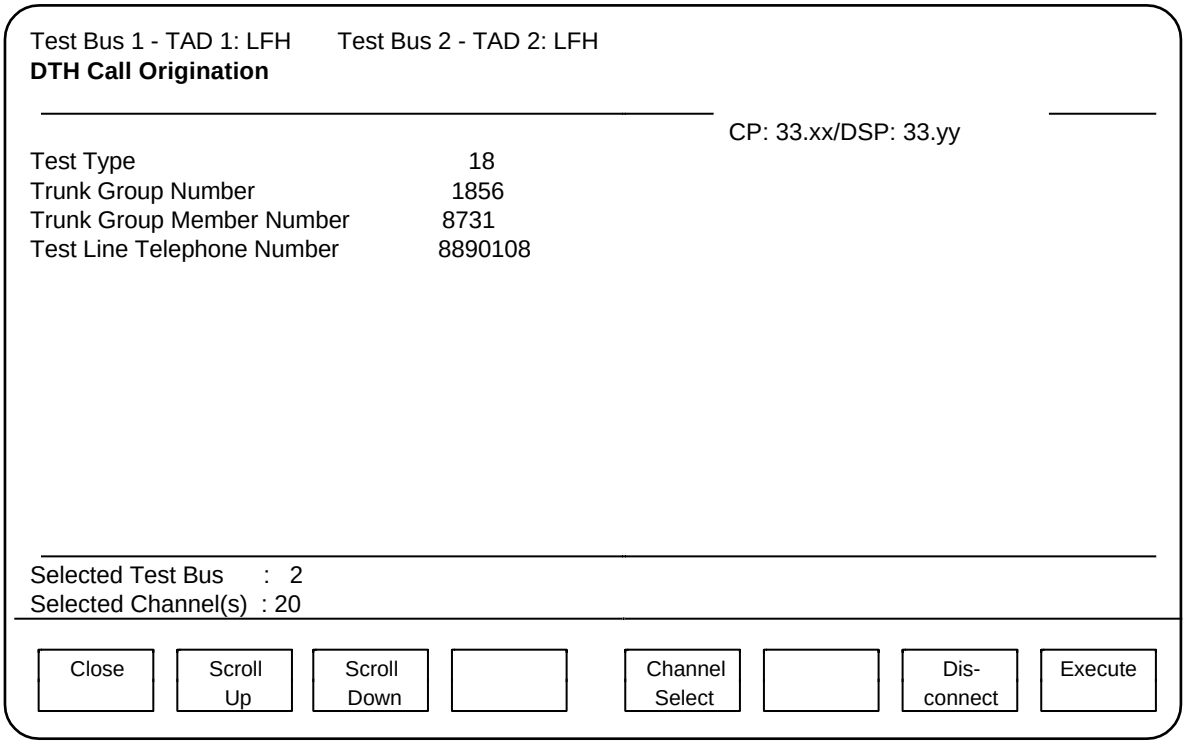
## Running a Transmission or Maintenance Busy Override test

To initiate call origination, and then a BERT to perform either a Transmission (08) or a Maintenance Busy Override (18) test:

1. Select Test Line Call Origination from the Menu of DTH Operations.

   *The "DTH call origination screen" appears.*

**Figure 7-1**
**DTH Call Origination screen**




2. Select the type of test to be run by placing its corresponding number in the field. Use the **`Scroll Up`** or **`Scroll Down`** softkeys to move through the three choices.
3. Press **`Down Arrow`** to move the cursor to the Trunk Group Number field, and enter a valid four-digit number.
4. Move the cursor to the Trunk Group Member Number field, and enter the appropriate four-digit number.
5. Now place the cursor in the Test Line Telephone Number field. Enter the Far-End Test Line Number assigned to the test line.
6. Choose the **`Channel Select`** softkey to reach the Selected Test Bus field. Enter either a I or a 2 to represent the TAD number.
7. After entering the TAD, the cursor automatically moves to the Selected Channels field. Enter the desired two-digit channel number between 0 1 and 24, and press **`Enter`** and choose the **`Execute`** softkey.
8. Wait about ten seconds for a wink from the switch (refer to "Messages" for an explanation of the possible messages you may receive here).

   *If the channel is accessible, a 'Call connected' message appears.*

   *If the call is successful, a 'Call connected after 2nd wink' message appears.*

9. After receiving this message, verify the channels status by choosing the **Status** softkey on the DTH Menu of Options, and then the **Channel Status** softkey.
10. After viewing the channel's status, choose the **Close** softkey to return to the Menu of DTH Options to begin testing.
11. To perform a BERT, follow the instructions under "Running the BERT". A brief description of the steps is:
    a. Select Digital Tests and Monitoring on the Menu of DTH Options.

    *The Digital Tests and Monitoring screen appears.*

    b. Select the Bit error ratio option from the Digital Tests and Monitoring screen.

    *The Bit Error Ratio Test Parameters Entry screen appears.*

    c. Select the parameters.
    d. Choose the **Execute** softkey to begin the test. The system attempts to perform a BER measurement on the selected TAD and channel for the specified duration. Either the following messages appear, depending on the circumstances:
        i. 'Test in progress; Waiting for synchronization.'
        ii. 'Test in progress; Synchronization achieved.'
        iii. 'Unable to synchronize. Invalid DSO format specified.'
        iv. 'Test aborted; Failed to start loopback.'
    e. You can check the status of the test at any time. For instructions, refer to "Displaying channel status". To display the results of the test, refer to "Displaying Bit Error Ratio Test results".
12. When testing on that trunk is complete, go back to DTH Call Origination. Use the **Disconnect** softkey to release the channel.

    *A a 'Connection has been dropped' message appears.*

13. Choose the **Close** softkey to return to the Menu of DTH Options. If testing is complete, highlight Logoff and choose the **Select** softkey.

## Performing a Home Office Verification test

To initiate call origination and then perform a BERT to perform a Home Office Verification (HOV) (78) test:

1. Select Test Line Call Origination from the Menu of DTH Operations.

   *The DTH Call Origination screen" appears..*

2. Select the type of test to run by placing its corresponding number in the field. Use the **Scroll Up** or **Scroll Down** softkeys to move through the three choices.
3. Use **Down Arrow** to move the cursor to the Trunk Group Number field, and enter a valid four-digit number.
4. Move the cursor to the Trunk Group Member Number field, and enter the appropriate four-digit number.

5. Now place the cursor in the Test Line Telephone Number field. Enter the Test Line Number assigned to the test line.
6. Use the **Channel Select** softkey to reach the Selected Test Bus field. Enter either a I or a 2 to represent the TAD number.
7. After entering the TAD the cursor automatically moves to the Selected Channels field. Enter the desired two-digit channel number between 0 and 24, and press **Enter** and select the **Execute** softkey.
8. Wait about ten seconds for a wink from the switch (refer to 'Messages' below for an explanation of the possible messages you may receive here).

   *If the call completes, a 'Call connected' message appears.*

9. After receiving this message, verify the channel's status by selecting the **Status** softkey on the DTH Menu of Options, and from there,the **Channel Status** softkey.
10. To perform a BERT:
    a. Select Digital Tests and Monitoring on the Menu of DTH Options.

       *The Digital Tests and Monitoring screen appears.*

    b. Select the Bit error ratio option from the Digital Tests and Monitoring screen.

       *The Bit Error Ratio Test Parameters Entry screen appears.*

    c. Select the parameters.
    d. Choose the **Execute** softkey to begin the test. The system attempts to perform a BER measurement on the selected TAD and channel for the specified duration,. You may see either the following messages, depending on the circumstances:
       i. 'Test in progress; Waiting for synchronization.'
       ii. 'Test in progress; Synchronization achieved.
       iii. 'Unable to synchronize. Invalid DSO format specified.
       iv. 'Test aborted; Failed to start loopback.'
    e. You can check the status of the test at any time. For instructions, refer to "Displaying channel status". To display the results of the test, refer to "Displaying Bit Error Ratio Test results".
11. When testing on that trunk is complete, go back to DTH Call Origination. Use the **Disconnect** softkey to release the channel.

    *A 'Connection has been dropped' message appears.*

12. Choose the **Close** softkey to return to the Menu of DTH Options. If testing is complete, highlight Logoff and choose the **Select** softkey.

## What to do if you can not achieve synchronization

If you can not achieve synchronization on a particular channel, move to another channel. To do this:

1. Choose the **`Abort Activity`** softkey, and reply with Y to the “Are You Sure’ question.
2. Use the **`Close`** softkey to return to the Menu of DTH Options.
3. Highlight Test Line Call Origination, and select the **`Disconnect`** softkey.

   *A ’Connection has been dropped’ message. appears*

4. Choose the **`Channel Select`** softkey, insert a different channel number, and select the **`Execute`** softkey.
5. If you receive a ‘Call Connected’ message, continue using the appropriate steps as described in the above two procedures.

## Messages

Here are the possible Call Disposition messages, along with explanations.

### Call could not be completed: Line busy

A busy tone (60 ipm) was detected.

### Call could not be completed: Reorder

A reorder tone (120 ipm) was detected.

### The test access port is locked out

On the specified teat access port (TAP), the DTH is detecting a sustained off-hook condition from the NE switch. It expected an on-hook (idle) condition. It is impossible to seize the circuit.

Near-end TAP locked out - Generally, this indicates an error in the switch or DS1 link from the DTH to the switch. For example:

- the switch did not detect the clear-forward condition (sustained on-hook from the DTH) associated with an earlier call.
- the signaling bit from the DTH did not change to on-hook as directed by DTH software
- the trunk serving as the chosen TAP was manually busied and set to off-hook by an operator at a switch MAP
- the DS1 interface card, either in the DTH or in the switch failed

The locked-out TAP may be restored to service during a routining cycle.

You may attempt calls on other TAPs in the same TAD, that is, in the same DTH-to-DMS DS1 link. If several successive calls on the same TAD encounter TAP lock-out, conserve the X.25 network resources. Do this by temporarily suspending tests that use this TAD.

### Call could not be completed: First wink was not received

The DTH sent the NE switch a seizing signal, but did not receive wink during a specified time interval.

Near-end TAP wink failure - Failure of the first wink is usually a switch error.

- There may be no available MF receivers at the time of the call attempt.
- The signaling bit from the DTH did not change to off-hook as directed by DTH software.
- The switch did not detect the off-hook transition.
- An operator at a switch MAP incorrectly data filled tables describing the trunk serving as the selected TAP.

A wink failure may be momentary, but several successive wink failures at least a minute apart generally indicate a persistent problem, suspend further attempts.

If there is a pattern of wink failures on several TAPS of the same TAD suspend tests using this TAD.

### Call could not be completed: Busy detected after first wink

The DTH received the first wink, it sent MF digits, and it detected a 60 ipm tone. The second wink was expected. The DTH was also monitoring for answer (sustained off-hook), 120 ipm tone, and time-out.

The TUT is busy because of a maintenance condition or routine traffic. Attempt the test again, but not within an interval that includes most of the holding times observed by the operating company for the trunk group being tested.

### Call could not be completed: Reorder detected after first wink

The DTH received first wink, it sent MF digits, and detected a 120 ipm tone. The second wink was expected. The DTH was also monitoring for answer (sustained off-hook), 60 ipm tone, and time-out.

Near-end reorder - The possibilities are:

- invalid priming digits
- invalid trunk group numbers
- invalid member numbers
- trunks or trunk groups that are system busy
- cases where the entire trunk group is busy

Further attempts may succeed. Consider a pattern of successive failures on the same trunk group or same interoffice facility before further attempts.

### Call could not be completed: Time-out after first wink

The DTH received first wink and MF digits were sent. No further signals (wink, answer, 60 ipm tone, or 120 ipm tone) were received during a specified time interval.

Near-end time out - Failure to receive neither the second wink nor any other result (NE reorder, NE busy, or NE busy). This indicates a switch error in most cases. There could be a call setup error due to a switchover in a switch peripheral. Failure of the digital tone detectors in the DSP firmware of the DTH is a remote possibility.

Further attempts may succeed. The re-attempt approach used for NE wink failure is probably applicable.

### Call connected after first wink

The DTH received first wink, MF digits were sent, and the DTH detected a sustained off-hook. The second wink was expected. An answer signal at this point may be appropriate for HOV calls and connection appraisal to local directory numbers. The DTH was also monitoring for 60 ipm tone, 120 ipm tone, and time-out.

Since any answer signal represents establishment of a connection with some termination device, do not immediately take down the call.

A answer signal in lieu of the second wink is possible for HOV calls and some connection appraisal calls. Else, there is a NE error. Possibly the DTH failed to detect the second wink.

### Call not completed: Busy detected after second wink

The DTH received second wink, and detected a 60 ipm tone. It expected the answer signal (sustained off-hook). The DTH was monitoring for answer, 60 ipm tone, 120 ipm tone, and time-out.

This may mean that FE busy means that all far-end test lines corresponding to the specified directory number are busy.

Since routining is an intensive process, and since multiple routining processes are normal, frequent FE busy conditions may mean that test submissions are too frequent. The routining process must automatically change the interval between test submissions to busy node, to minimize ineffective attempts.

### Call not completed: Reorder detected after second wink

The DTH received second wink, and detected a 120 ipm tone. It expected the answer signal (sustained off-hook). The DTH was monitoring for answer, 60 ipm tone, 120 ipm tone, and time-out.

Interpretation of FE reorder depends on how call processing is arranged for the FE test lines. Configure switches to apply:

- 60 ipm busy tone when the call group of test lines are all busy
- 120 ipm reorder tone when there are other far-end errors

Following this recommendation for FE reorder could mean that the directory number outpulsed from the NE is invalid at the FE. There could be distortion of the MF digits sent from the NE.

Consider the pattern of similar errors before further attempts to the same FE.

### Call not completed: time-out after second wink

The DTH received second wink. It received no further signals (answer, 60 ipm tone, or 120 ipm tone) d during a specified time interval. It expected the answer signal (sustained off-hook).

Generally, this is the failure of the called test line to answer the call. For example, the FE DTH may have failed. However, there are other possibilities. Either the near-end switch or DTH did not detect the answer signal or the 120 ipm or 60 ipm tone treatments. There could be a problem in the FE switch.

Consider the pattern of similar errors before further attempts to the same FE.

### Call connected after second wink

The DTH received second wink, and detected a sustained off-hook. It was monitoring for answer, 60 ipm tone, 120 ipm tone, and time-out.

# Message list

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (1) Request denied; Command restricted to administrator | Only user with administrator privileges may perform this command. | Ask administrator to perform activity. |
| DTH (2) Request denied; hardware diagnostics in progress | Hardware diagnostics in progress | 1 - Wait until diagnostics are complete.<br>2 - Reboot DTH: but first 'busy' all associated trunks. |
| DTH (3) Request denied; DTH is locked by system administrator | Cannot use the DTH, the system administrator has locked it. | Request system administrator to unlock it. |
| DTH (4) Activity has been aborted | Abort activity executed | Repeat activity |
| DTH (5) Request denied; No activity or results pending on specified channel(s) | No test results available for TAD and channel combination selected | Verify that TAD and channel combination are the correct ones. |
| DTH (6) Request denied; not channel(s) owner | 1 - A local user trying to use channels owned by the Admin user.<br>2 - Admin user trying to use channels allocated by Local user. | 1 - Log out and back in again as admin user, and repeat activity, or log in as admin user, de-allocate channel(s), and continue.<br>2 - Login as local user, de-allocate channel(s) and continue. |
| DTH (7) Request denied; Channels are not in the same state | Pressed the Selected Ch. State softkey for channels that are not in the same state. | 1 - Use Channel Status softkey instead<br>2 - Select channels that are in the same state. |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (8) Request denied; Channels are not performing a joint activity | Selected Abort activity on one or more channels not performing the same functions. | Select only channel(s) used for activity, then perform abort activity. |
| DTH (9) Request denied; No test results available for specified channel | 1 - Results already retrieved<br>2 - Channel(s) selected does not have test result spending | 1 - Re-run last test<br>2 - Select a channel(s) containing pending results. |
| DTH (10) Request denied; No channels specified | Have not selected channel(s) to be used in performing activity. | Select channel(s), and re-try activity. |
| DTH (11) Request denied; No TAD specified | Failed to specify TAD to be used for activity. | Select appropriate TAD, and re-try activity. |
| DTH (15) Request denied; This is a single channel command | Selected more than one channel to perform an activity requiring one channel. | Reduce channel selection to one. |
| DTH (16) Request denied; Channel(s) specified in use. | Activity attempted on a channel(s) already in use. | 1 - Select idle channel and re-try activity.<br>2 - Abort current activity on specified channel, and re-try desired activity. |
| DTH (17) Request denied; Channel in connected state | 1 - Attempted to abort a function on a channel whose state is ‘connected’.<br>2 - Attempted to originate call on channel whose state is ‘connected’. | 1 - Use Call Origination’s Disconnect softkey instead of Abort Activity.<br>2 - Chose a different channel. |
| DTH (19) Request denied; Loss of signal on specified TAD | 1 - TAD cable fault (broken or disconnected).<br>2 - Temporary facility fault.<br>3 - Problem in switch. | 1 - Repair fault in TAD cable<br>2 - Wait to see if facility recovers.<br>3 - Call switch support |
| DTH (20) Request denied; Results pending on channel(s) | 1 - Attempted to abort activity on channel that has pending test results<br>2 - Attempted to initiate new test on channel that has pending test results | Retrieve results from channels(s) before attempting any other activity |
| DTH(21) Request denied; channel(s) not in connected state | Attempted to disconnect channel(s) not in connected condition (idle). | Choose a ‘connected’ channel and perform a disconnect. |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (22) Request denied; Feature is not present | DTH not equipped to perform activity requested. | 1 - Change DTH's configuration.<br>2 - Try alternate activity. |
| DTH (23) Request denied; insufficient test resources available | 1 - All test engines busy<br>2 - No originating channels available<br>3 - Test engine malfunction | 1 - Wait for available test engine, and re-try activity.<br>2 - Add more DS0 circuit packs.<br>3 - Re-boot DTH. |
| DTH (24) Request denied; invalid digits use | Entered invalid digits in Call Origination fields<br><br>***Note:*** (pound sign (#) is not a digit | Remove all invalid digits from fields(s) and re-try activity. |
| DTH (26) Request denied; invalid duration specified | Selected duration of 0 00:00. | Select a valid test duration between 1 second and 9 days, 23 hrs., 59 min., and 59 seconds. |
| DTH (27) Request denied; invalid loop back device specified | Specified MJU unit on a DS facility. | Use 'None' as the loop back device. |
| DTH (28) Request denied; test in progress waiting for synchronization | 1 - Digital test attempted prior to call origination<br>2 - Temporary facility fault<br>3 - Signaling fault in facility | 1 - Originate call, after connection, start activity<br>2 - Wait for fault to clear<br>3 - Call switch support |
| DTH (29) Test in progress; synchronization achieved | Successful start of test. | Informational message |
| DTH (30) connection has been dropped | 1 - DTH user disconnected the channel | 1 - Proceed with other activities<br>2 - Originate call again and re-start activity. |
| DTH (31) Request denied; channel(s) must be idle to be allocated | Attempted to allocate non-idle channels | Change channel(s) to idle, and allocate them. |
| DTH (32) Channel(s) allocated | The channel(s) requested have been allocated | Informational message |
| DTH (33) Request denied; Channel(s) specified not in allocated state | Attempted to de-allocate channel(s) not allocated | Check channel(s) status and select only allocated channel(s), then de-deallocate them. |
| DTH (34) Channel(s) decollated | Successfully de-allocated the channel(s) | Informational message |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (41) Call connected | Call placed using Call DTH; function successfully connected | Informational message |
| DTH (42) Answer DTH in progress | Call placed using Answer DTH, but it has not yet been answered | 1 - Wait for a complete connection (there is a 60 second time-out).<br>2 - Call never connected, switch/facility fault, contact switch/facility maintenance group. |
| DTH (47) Test in progress | Current test not completed | Wait for test to complete, or abort it. |
| DTH (48) Test in progress; Warning High BPVs on TAD | Fault in facility. High BPVs have occurred (not-fatal) | 1 - Wait for facility to recover.<br>2 - Call support group for defective facility. |
| DTH (49) Tests in progress; WARNING - Frame failures on TAD | Fault in facility. Frame slips have occurred (fatal). | 1 - Wait for facility to recover.<br>2 - Call support group for defective facility.<br>3 - Change framing format in DTH or switch. |
| DTH (50) Test done | Test successfully completed | Informational message |
| DTH (51) Test done; Warning High BPVs on TAD | 1 - Test complete, but DTH detected high BPVs.<br>2 - DTH's framing format does not match that of switch. | A transient facility fault may have occurred, re-try test. If fault persists, contact switch facility maintenance group. |
| DTH (52) Test done; Warning - Frame failures on TAD | Test completed, but during test, DTH detected frame slips | May have been transient facility or switch hardware fault; re-run test. If fault persists, contact switch/facility maintenance group |
| DTH (53) Activity aborted: DS1 card was removed | 1 - DS1 circuit pack removed during test.<br>2 - DS1 card fault | Busy trunks on TAD; power down DTH; re-install DS1 packs power up DTH, re-run test. |
| DTH (54) Activity aborted; loss signal detected | 1 - Loss of signal detected during test<br>2 - DTH hardware fault | 1 - Facility/switch, re-run test; if fault persist, contact switch/facility maintenance group<br>2 - Run DTH diagnostics |
| DTH (55) Activity aborted; loss of signal detected | 1 - Loss of signal detected during test.<br>2 - DTH hardware unit | 1 - Facility/switch fault, re-run test; if fault persists, contact switch/facility maintenance group<br>2 - Run DTH diagnostics |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (56) Activity aborted by hardware diagnostics | Invoked hardware diagnostics which terminated current activity | Re-try activity upon completion of diagnostics. |
| DTH (57) Answer DTH connected | Call connected | Informational message |
| DTH (60) Operational measurements accumulated since reset | Accessed Operational Measurements screen | Examine screen to obtain desired information |
| DTH (62) Input is out of range | Parameters inserted not within proper range | Insert valid parameters |
| DTH (63) Incorrect login | 1 - Wrong or misspelled user name or password<br>2 - ROM pack changed | 1 - Check with DTH admin for a valid login.<br>2 - Invoke password recovery procedure |
| DTH (64) Password change is on line | Password successfully updated. | Informational message |
| DTH (65) Password change rejected | 1 - Confirmation password does not match previously-entered password<br>2 - Keyboard malfunction | 1 - Select Change Password again and re-enter password.<br>2 - Troubleshoot or replace terminal. |
| DTH (66) Lockout already in effect | Attempted to lock an already locked DTH | Informational message |
| DTH (67) Lockout now in effect | DTH Lock successfully completed | Informational message |
| DTH (68) Lockout not in effect | Attempted to unlock an unlocked DTH | Informational message |
| DTH (69) Lockout has been canceled | Successfully unlocked previously-locked DTH | Informational message |
| DTH (70) Request denied; Channel (s) on TAD are in use | Channel(s) and TAD selected are performing previously-initiated procedures. | Abort activities on TAD before changing TAD configuration. |
| DTH (71) New TAD configuration on-line | System successfully updated TAD configuration. | Informational message |
| DTH (75) Hardware diagnostic complete | Hardware diagnostics that were initiated have finished. | Informational message |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (76) Request denied; Function not supported by DS1 NT7F24 | Not used | Not used |
| DTH (77) Request denied; Channel already connected with different channel unit | The channel requested is already being used by another unit (for example, MJU) | 1 - Select a different channel<br>2 - Disconnect the selected channel from channel unit and re-try test. |
| DTH (78) Supervision changed | Pressed the Change Supervision softkey | Informational message |
| DTH (79) Request denied; Supervision undefined for channel unit | The selected channel unit does not support the chosen supervision state. | 1 - Choose a different supervision state.<br>2 - Select a different type of channel unit. |
| DTH (80) Request denied; Supervision changes restricted to once per second | Attempted to change supervision too quickly pressed the keys too fast | Type more slowly |
| DTH (83) Request denied; the activity requires B8ZS TAD configuration | The test configuration requires the TAD to be configured as B8ZS | Change TAD configuration to B8ZS and re-try test. |
| DTH (86) Call could not be completed; time-out | Message no longer in use | Message no longer in use |
| DTH (87) Test aborted; Call not connected | Test could not be run because call could not be connected. | Informational message |
| DTH (88) Activity aborted; DS0 card removed | Activity initiated could not be performed because DTH's DS0 card was removed. | Install a DS0 card |
| DTH (91) Request denied; channel is not available for use | DS0 card removed from DTH while a BERT was in progress | 1 - Power down DTH and re-install DS0 card.<br>2 - Reset DTH to redistribute test resources. |
| DTH (92) Request denied; channel not associated with a TAD | Attempted a digital test on a channel associated with ROTL (typically channels on TAD1). | Choose a channel associated with DTT section of the DTH (typically TAD 2) |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (93) Request denied; TAD not available | 1 - Attempted to change configuration of a TAD associated with a ROTL.<br>2 - A DS1 card is either defective or was removed. | 1 - Select a TAD associated with DS1 card.<br>2 - Install DS1 card or replace defective one. |
| DTH (94) Request denied; ROTL is not active | Attempted to perform a test that requires ROTL functionality | 1 - Start ROTL functionality.<br>2 - If you suspect a defective ROTL, run ROTL diagnostic procedures. |
| DTH (95) Request denied; ROTL active | Initiated ROTL calibration procedures while it was actively in use. | Stop ROTL, and re-try calibration procedures. |
| DTH (96) Request denied; VF interface not available | Attempted to select the ROTL menu in a DTH that has no VF circuit pack. | 1 - Informational message.<br>2 - Install ROTL pack in DTH. |
| DTH (97) Request denied; Specified VF port cannot be made busy or idle | Hardware problem in VF pack. | 1 - Perform DTH diagnostics.<br>2 - Replace VF circuit pack. |
| DTH (98) Request denied; Specified VF port is already blocked | Attempted to block a ROTL port that is already blocked. | Informational message |
| DTH (99) Specified VF port is already idle | Attempted to free a ROTL port that is already free. | Informational message |
| DTH (100) New 105-testline provisioning on-line | Successfully provisioned the 105-testlines in the DTH. | Informational message |
| DTH (101) New calibration value stored | Successfully calibrated the ROTL's values. | Informational message |
| DTH (102) ROTL functionality started | ROTL is now ready for use. | Informational message |
| DTH (103) ROTL functionality stopped | ROTL is no longer functioning. | Informational message |
| DTH (104) ROTL port blocked | Pressed the Block Port softkey. | Informational message |
| DTH (106) ROTL port unblocked | Pressed the Abort Activity softkey. | Informational message |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (107) Request denied; Use Stop ROTL to abort activity on ROTL | Attempted to use the Abort Activity softkey for ROTL channel. | Use Stop ROTL to abort activity on ROTL. |
| DTH (108) calibration values cleared | Pressed the Clear softkey. | Informational message |
| DTH (109) Request denied; Invalid pseudo-random pattern specified | Specified an improper pseudo-random pattern. | Choose a valid pattern. |
| DTH (110) Unable to synchronize invalid DS0 format specified | Specified improper DS0 format. (Old message) | Choose a valid format. |
| DTH (111) Request denied; Invalid bit rate specified | Chosen bit rate not in range of valid parameters. | Specify a valid bit rate. |
| DTH (115) Request denied; BERT must be in progress for error injection | Attempted to inject errors when BERT was not active. | Re-try during an active BERT. |
| DTH (116) Reset has been started | Reset begun. | Informational message |
| DTH (118) One error will be injected shortly | Requested error injection will occur soon. | Informational message |
| DTH (119) MJU operation failed | Requested operation could not be accomplished. | 1 - No MJU available.<br>2 - Defective MJU. |
| DTH (120) MJU operation succeeded | Requested operation was executed. | Informational message |
| DTH (121) Activity has been aborted; Warning-failed to remove loop | Aborted the activity, but MJU failed to clear loopback. | Reset MJU |
| DTH (122) Test done; Warning-failed to remove loop back | Test completed OK, but MJU failed to clear loopback. | Reset MJU |
| DTH (123) Test done; Warning High BPVs and failed to remove loop back | Test completed OK; bipolar violations occurred on TAD, but MJU failed to clear loopback. | Reset MJU |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (124) Test done; Warning-frame failures and failed to remove loopback | Test completed OK, but frame slips occurred on TAD, and MJU failed to clear loopback. | Reset MJU |
| DTH (125) activity aborted; Failed to start loop back | Activity aborted, but MJU failed to initiate loopback. | Reset MJU |
| DTH (126) Activity aborted; Digital monitor failure | Not used | Not used |
| DTH (127) Wink sent | Pressed the Send Wink softkey. | Informational message |
| DTH (130) Request denied; This is a two channels command | Two channels required to perform command, only one specified. | Specify a second channel. |
| DTH (134) The test access port is locked out | On specified TAP, DTH detected a sustained off-hook condition from near-end switch. | 1 - Run diagnostics on DTH DS1 card from local terminal.<br>2- Reset DTH |
| | Switch failed to detect clear forward condition of earlier call. | Have switch support rts TAP trunks. |
| | DS1 card in switch or DTH failed. | 1 - Run diagnostics on DTH DS1 card from local terminal several times. I f diagnostics fail consistently, replace card; else reset DTH.<br>2 - If faults continue to occur on DTH when testing random trunks, replace DS1 card. |
| | Signaling bit from DTH stuck in on-hook state. | Reset DTH |
| | TAP was Made Busy and set to off-hook by MAP operator. | Contact switch support to learn trunks’s state. |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (135) Call not completed; first wink not received | 1 - DTH sent seizing signal to near-end switch, but no wink returned within allotted time.<br>2 - No MF receivers available.<br>3 - Signaling bit from DTH stuck in on-hook state. | 1 - Attempt test (call) again. Normally, this error is a momentary condition (submit test at least one min. apart)<br>2 - Persistent failures may require resetting DTH. |
| | 1 - Near-end switch may not have detected off-hook transition.<br>2 - Tables describing specified TAP trunk are incorrectly data filled. | 1 - Contact switch support t0 learn trunks's state.<br>2 - Verify that tables describing TAP are correctly data filled. |
| DTH (136) Call not completed; Busy detected after first wink | 1 - DTH sent MF digits, and a 60 ipm tone was detected.<br>2 - TUT is Made Busy.<br>3 - Routine traffic active on faulty link. | Re-try test (call) |
| DTH (137)Call not completed; Reorder detected after first wink | 1 - DTH received first wink; MF digits sent, and reorder (120 ipm) tone detected.<br>2 - Trunk faulty or trunk on a faulty link. | 1 - Attempt additional tests on other trunk group members. A pattern of failures on the same members suggests that near-end switch does not recognize digits sent. Verify that near-end switch is correctly datafilled to process digits.<br>2 - Random test failures of trunks in different trunk groups but in same facility may indicate a bad link. Check linked facility. |
| | Invalid priming digits | Consistent premature answer signals on specific trunk or trunk group may require verification of number translations in near-end switch |
| | 1 - Invalid trunk group numbers (that is, attempting to test an incoming trunk).<br>2 - Invalid member numbers. | 1 - Contact near-end switch support group and verify that TUT is an outgoing trunk. |
| | Out pulsing failure on TUT | |
| | 1 - Trunk trunk groups SB (system busy).<br>2 - Entire trunk group busy. | Verify that trunk group not in system busy state. |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (138) Call not completed; Time-out after first wink | First wink received by DTH and MF signals sent. but no further signals received within allotted time. | Attempt test (call) again. Normally, this error is a momentary condition (submit test at least one min. apart). |
| | Set up error due top switch over in switch peripheral. | Contact switch support to determine if switch over has occurred. If so, re-try test when switch over has completed. |
| | Failure of digital tone detectors in DSP firmware of DTH. | Persistent failures may require resetting DTH. |
| DTH (139) Call connected after first wink | DTH received first wink, and MF digits, off-hook detected, but answer was received instead of second wink. | Continue test since answer signal indicates a call connection. |
| | DTH may have failed to detect second wink. | Run diagnostics on DTH to determine if it is faulty. May require replacement if faults are found. |
| DTH (140) Call not completed; Busy detected after second wink | DTH received second wink followed by a busy (60 ipm) tone. | Re-try test after a short interval |
| | All far-end test lines corresponding to directory number are busy. | Re-try test after a short interval |
| DTH (141) Call not completed; Reorder detected after first wink | DTH received second wink followed by a re-order (120 ipm) tone. | Re-try test after a short interval |
| | Directory number out pulsed from near-end is invalid at far-end. | Consistent re-order may require verification of number translations in far-end switch for specified test line. |
| | Distortion of MF digits sent from near-end to far-end could have occurred. | Additional verification of TUT may be necessary to locate distortion generating points. |

**Table 8-1**
**DTH generated messages**

| Condition | Possible cause | Corrective action |
|---|---|---|
| DTH (142) Call not completed; Time-out after second wink | DTH received second wink but no further signals were detected within allotted time. | 1 - Attempt test (call) again. Normally, this error is a momentary condition (submit test at least one min. apart).<br>2 - Persistent failures may require resetting DTH. |
| | Either far-end DTH or its 108-test lines may have failed. | Run diagnostics on far-end DTH to determine if it is faulty. |
| | Near-end switch of DTH failed to detect answer busy or re-order tone treatments. | 1 - Run diagnostics on far-end DTH to determine if it is faulty.<br>2 - run another test using same near-end DTH, but a different far-end DTH. |
| | Problem in far-end switch | Notify far-end switch support of problem. |
| DTH (143) All connected after second wink | DTH received second wink, sustained off-hook detected. | Normal call connection, please proceed with activity. |
| DTH (144) Test done; WARNING: Premature far-end release | 1 - Call released by far-end test line or be either switch before DTH completed specified BERT.<br>2 - Disconnect Timer set to less than BERT duration. | Examine Disconnect Timer value in far-end DTH. It must be greater than expected BERT duration. |
| DTH (145) Call not completed; Continuity check failure after first wink | TOPS or facility problem, may be a temporary condition. | 1 - Contact switch support (translations).<br>2 - Re-try test |
| DTH (146) Call not completed; Continuity check failure after second wink | TOPS or facility problem, may be a temporary condition. | 1 - Contact switch support (translations).<br>2 - Re-try test |
| DTH (147) Call not completed; disconnect after first wink | TOPS or facility problem, may be a temporary condition. | 1 - Contact switch support (translations).<br>2 - Re-try test |
| DTH (148) Call not completed; Disconnect after second wink | TOPS or facility problem, may be a temporary condition. | 1 - Contact switch support (translations).<br>2 - Re-try test |

Network Test Systems

# Digital Test Head

Operations

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