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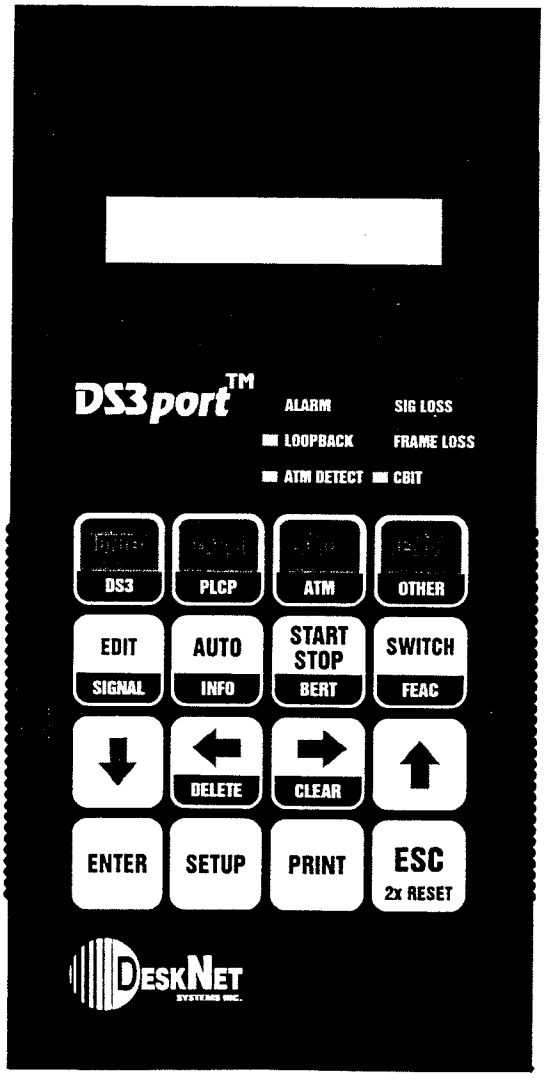
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DS3port Operating Guide

Supplement May, 1994



DESKNET™ SYSTEMS INC.

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Supplement - DS3port Operating Guide, Version 1.0

Supplement DS3port Operating Guide - May 1994

The following pages should be used as a supplement the DS3port Operating Guide, Version 1.0 that follows. These changes and corrections will be incorporated into new printings of the DS3port Operating Guide, but the edition, Version 1.0, will not change.

Information in this supplement supersedes the DS3port Operating Guide, Version 1.0. The DS3port Operating Guide, Version 1.0, directly follows this addendum.

Models, Serial Numbers, Software Revision

This supplement describes the operation of the following DeskNet products.

- DS3port Craftsman, Software Revision PR1.6 and greater.
- DS3port Dataman, Software Revision PR1.6 and greater.

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DS3 Corrections and Additions

M13 Framing Format

M13 framing will be active whenever "M13-BIT FRAMING" is selected as the DS3 Framing Format from within the DS3 Setup Option menus. The framing will remain in M13 format, ***even when ATM Cell transmission is occurring***.

FEAC Detection

The reception of FEAC codes will not cause the Alarm LED to light. This was not stressed in the original operating guide.

PLCP Alarms

Receiving DS3 BERT patterns or DS3 Alarm and IDLE codes will result in the activation of various PLCP alarms since the PLCP framing information will not be present in the DS3 signal.

ATM DETECT LED

The ATM Detect LED will occasionally light when receiving pseudo random patterns sent within PLCP framing. This occurs because the patterns result in 4 sequential bytes followed by what appears to be a valid ATM Cell header checksum.

"Send ONCE" Error Generation

Errors that are sent once by pressing the ENTER key *and* are transmitted using more than one bit within a DS3 or PLCP frame may occasionally be distributed across frame boundaries resulting in no detection of the error at the connected equipment.

Monitor DS3

Errored Information Blocks or EIB errors represent the number of information blocks in which one or more errors occurred. Information blocks are sequential blocks of the DS3 frame bounded by a framing bit. They are 85 bits long. Comparison of EIB counts to BPV errors will help you to determine whether the error source is "bursty" in nature. A small count of EIB errors relative to a larger count of BPVs indicates "bursty" error conditions.

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Update - Bit Error Rate Testing

Introduction

This section should be used ***in place of*** "Quickstart - Bit Error Rate Testing" in the DS3port Users Guide.

General BERT Testing

Please note the following general observations regarding Bit Error Rate Testing with the DS3port.

- The DS3port is capable of sending bit patterns within the DS3 payload, within the PLCP payload, and within ATM Cell payload.
- The DS3port has 7 pre-programmed patterns, including the standard PRSB patterns, available for BERT testing. These patterns are selected from within the SETUP BERT menu.
- The DS3port can be set to transmit patterns that contain errors as a rate of 1.0 E^{-3} and 1.0 E^{-6}. This option is selected using the SETUP BERT menu.
- The DS3port can send individual errors during BERT testing. Pressing the ENTER key while running a BERT test will send a single bit pattern error.
- DS3 and PLCP BERT will continue to operate in the background so that you can leave the BERT screens and check the DS3, PLCP, and ALARM results. Pressing BERT DS3, or BERT PLCP, will return you to the test in progress.
- ATM BERT testing will always begin anew whenever BERT ATM is pressed.
- While viewing any BERT display EDIT CLEAR can be used to clear the results and restart the test.
- There are 8 BERT displays that can be viewed while running a test. They are accessed using ⇦⇨ . They provide the Bit Error Rate (BER), count of errors (ERRS), count of bits received (BITS), rate in errors per second (E/S) for the current second, errored seconds (ESEC), threshold seconds (THSEC), error free percentage (EFREE), and the total number of seconds the BERT test has been running (TTL SEC).

DS3 BERT Testing

The DS3port has the capability to transmit BERT test patterns, defined in the default BERT setup (refer to *"BERT Setup Options"*), within the DS3 payload. This is a BERT pattern that is surrounded by DS3 framing information.

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Please Note: *The DS3port must receive a BERT pattern from another source, usually a DS3port or itself (via looping back the complete DS3 stream), in order to analyze the BERT measurements correctly.*

Please Note: *When in DS3 BERT the ATM CELL DETECT LED ceases to operate.*

The following steps describe the operation of DS3 BERT. It is assumed that a loopback cable is attached from the OUT to the IN jacks on the DS3port connector panel. It is also assumed that a default BERT pattern and NO ERROR Injection has been selected within BERT Setup.

Figure 1

```
DS3 BERT
SYNCHRONIZING          >
```

1. From the TOP Level Menu press BERT then DS3. The display should briefly appear as shown in Figure 1 and then end up as Figure 2. In the first display "SYNCHRONIZING" indicated that the DS3port was busy aligning itself to the BERT pattern. The DS3port might also briefly indicate Out-Of-Frame or OOF during this time in the upper right corner.

Figure 2

```
DS3 BERT
NO ERRORS              <
```

2. Figure 2 shows that the DS3port is now transmitting the selected BERT pattern within the DS3 payload and has aligned to it. It also indicates that NO ERRORS have been detected. Note, that in the lower right hand corner of all BERT displays, a moving "activity" indicator ">" appears. Whenever a correct and identifiable BERT pattern is detected the activity indicator will move from ">" to "<".

Figure 3

```
DS3 BERT          LOS
NO ERRORS              <
```

3. Now, remove the loopback cable and the display will indicate that the DS3port has lost signal (there is an LOS in the upper right side of the display). See Figure 3.

Figure 4

```
DS3 BERT
9.6245E-07             >
```

4. Now replace the connector, but "jiggle" it slowly back into place to cause errors at the receiver, then seat it firmly. This may take a few attempts. The BERT display will now show a calculated error rate similar to Figure 4.
5. The Error Rate shown in the lower left corner will be constantly *decreasing* in this case.

Figure 5

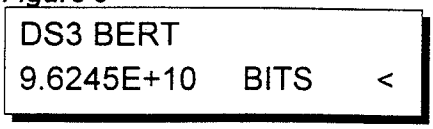
```
DS3 BERT
0.000E+00  ERRS        <
```

6. Press EDIT CLEAR to restart the BERT test and clear the results. the display will again indicate no errors as in Figure 2.
7. Use the ⇨ key once to view the Error Count display. Figure 5 indicates that no errors have been detected.

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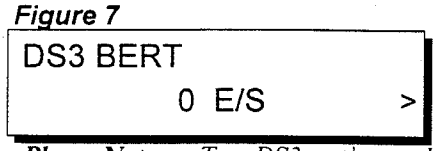
8. Individual errors can be transmitted by pressing the ENTER key. Press the ENTER key now and watch as the Error count, as shown in Figure 5 increases.

Figure 6



9. Press ⇨ and a display similar to Figure 6 shows a count of the number of correct bits received since the BERT was started. This number should be increasing rapidly.
10. Press ⇨ key again, and a display similar to Figure 7 shows a count of the number of errors per second being received. Unless you have turned on Error Generation this number will be 0.

Figure 7



11. Use the ⇨ key to examine the other BERT displays. Remember that EDIT followed by CLEAR is used to reset any of these displays to zero.

Please Note: *Two DS3port's may be used to test an individual DS3 circuit but care must be taken to specify the same BERT patterns within the BERT SETUP options. If this is not done the receiving DS3port will NEVER frame itself to the incoming BERT signal.*

PLCP BERT Testing

PLCP BERT operates similarly to DS3 BERT described above. The BERT pattern is transmitted within the 125 microsecond PLCP frame.

To select PLCP BERT, from the top level menu, press BERT and then PLCP.

Please Note: *When in DS3 BERT the ATM CELL DETECT LED ceases to operate.*

ATM BERT Testing

ATM BERT operates similarly to DS3 BERT described above. The BERT pattern is transmitted within the ATM cell structure using TRANSMIT HEADER #1's settings for VPI and VCI Virtual Cell streams. The DS3port uses ATM Receive Filter #1's header to recover the BERT pattern.

Please Note: *Receive Filter 1 must be setup so that the ATM cells arriving with the BERT pattern MATCH its value. If this is not done the DS3port will not be able to perform ATM BERT analysis.*

To select ATM BERT, from the top level menu, press BERT and then ATM.

ATM BERT will operate at 100% bandwidth whenever Constant Header #1 is selected as the Cell Generation method. To use less than 100% of the bandwidth for ATM BERT the following 4 steps must be taken:

1. TXMIT HEADER #1 payload must be set to BERT PAYLOAD using the EDIT BERT keys when editing the TXMIT HEADER 1 payload.

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2. Turn on ROUND-ROBIN ATM Cell Generation mode.
3. Start ATM BERT by pressing BERT ATM.

Please Note: *The DS3port will take longer to "SYNCHRONIZE" if ATM BERT is used at low utilization. Up to 30 seconds may be required to synchronize to 5% bandwidth ATM Bert streams that are using PRSB patterns.*

Please Note: *The activity indicator will only move when the virtual circuit carrying the BERT payload is being received. If this indicator remains stopped the virtual ATM cell stream carrying the BERT payload is no longer present.*

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Test Storage and Retrieval

The DS3port can store the following test result in its memory for later recovery.

- Error Counters For DS3, PLCP, and ATM - All Error results are stored whenever MEMORY is pressed while viewing any one of the Error Displays.
- DS3 BERT - stored by pressing MEMORY within the DS3 BERT displays.
- PLCP BERT - stored by pressing MEMORY within the PLCP BERT displays.
- ATM BERT - stored by pressing MEMORY within the ATM BERT displays.

These results are time and date stamped and labeled with the current test tag. To re-call them for review Press MEMORY from the top level and use the arrow keys to scroll and select a individual stored test. Once the test you wish to recall is present on the LCD display press ENTER to bring up the actual test results.

Tests viewed in this manner **can be printed or downloaded** by pressing PRINT while they are being viewed. Below are a few examples of this feature.

Storing DS3, PLCP BERT Results and the DS3port Error Counters

The following example shows how DS3 and PLCP BERT results may be stored in the DS3port and retrieved at a later date.

Figure 8

```
DS3 BERT
NO ERRORS                >
```

1. From the top level press BERT DS3 (assuming a loopback cable is attached) to begin the DS3 Bit Error Rate test. A display similar to Figure 8 should result.

Figure 9

```
DS3 BERT
3.000E+00  ERRS          >
```

2. Press ENTER 3 times causing 3 individual bit errors. Press the ⇨ key to view the Error display. It will look something like Figure 9.
3. Now press the MEMORY key to store these results.

Figure 10

```
PLCP BERT
0.000E+00  ERRS          >
```

4. Press PLCP to start the BERT PLCP test. Notice that the error count is reset since this is a new test. A display similar to Figure 10 should result. Again use the ENTER key to cause 10 errors.
5. Now press MEMORY to store the PLCP BERT results.

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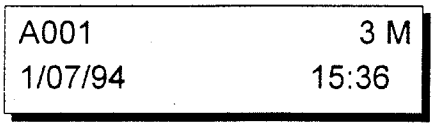
6. Now that we have stored BERT we will also learn to store the error counter values. Press ESC to get to the Top Level menu. Then press MONITOR DS3. The standard DS3 error counters will be available. Press MEMORY to store them. Whenever error counters get stored, the DS3port stores not only the current group that you are viewing (DS3) but also stores the PLCP and ATM counters.

The DS3port now has stored 3 groups of test results. DS3 BERT, PLCP BERT, and all the error counters. The DS3port can now be powered OFF and then ON. The results will not be lost.

Retrieving Stored Tests

The following example shows how to retrieve and view stored test results.

Figure 11



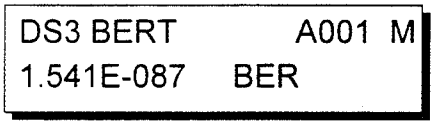
1. From the Top Level menu press the MEMORY key. A display similar to Figure 11 will result. This display indicates that you are viewing the stored test record that is labeled A001, and that it was stored on January 7th, 1994 at 2:36 P.M. The display also indicates that there is a total of 3 stored tests. The Flashing "M" in the upper right side of the display lets you know that you are viewing stored tests not real-time results.

Figure 12



2. Press the ⇨ to view the headers description. In this case it is "DS3 BERT RECORD" since that is the first test result we stored. See Figure 12
3. You are viewing only a test record "header" that contains the test tag, storage date/time, and the record type. To see the actual stored results they must be recalled using the ENTER key. Press the ENTER key to recall the DS3 BERT test results.

Figure 13



4. Figure 13, shows the resulting DS3 BERT display. It looks almost like a "live" BERT test. The flashing "M" lets you know that you're viewing a stored result. The ⇦⇨ now allow you to see the different BERT results that were stored. Use the ⇨ key once to view the ERRORS display. Note that 3 errors were recorded which exactly matched the number of errors sent during the actual DS3 BERT test. Refer back to Figure 9.
5. ENTER will switch you back to the record header mode. From here you can select the other stored tests, and use ENTER to view their results. Experiment until you are comfortable with this operation.

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Printing and Downloading Stored Results

The following example shows how to print or download stored test results. Please make sure that the DS3port is connected to a serial printer or a computer running a terminal emulation program. Refer to Page 61 of the Operating Guide for further information.

1. Select the DS3 BERT results from memory and view them. (Follow the previous sections instructions to find out how this is done.) A display similar to Figure 13 should be showing.
2. Press the PRINT key. The complete DS3 BERT results, as shown below, will be sent to the printer or computer. PRINT, when pressed while viewing a stored memory record, will result in a printout or download exactly as if an active test was being performed.

Example DS3 BERT Test Printout

```
DS3port   PR 1.6
TEST TAG: A001  1/07/92  6:36
DS3  BERT
1.541E-08 BER
3.000E+00 ERRORS
1.947E+08 BITS
     3 ESEC
     0 THSEC
 40.00% EFREE
DUR:  0:00:05
```

Clearing Stored Tests

Stored test results can be deleted in one of two ways. While viewing a record header or actual test results EDIT DELETE will remove **only that record.** To remove **all the DS3port's stored tests** EDIT CLEAR must be pressed from the record header display.

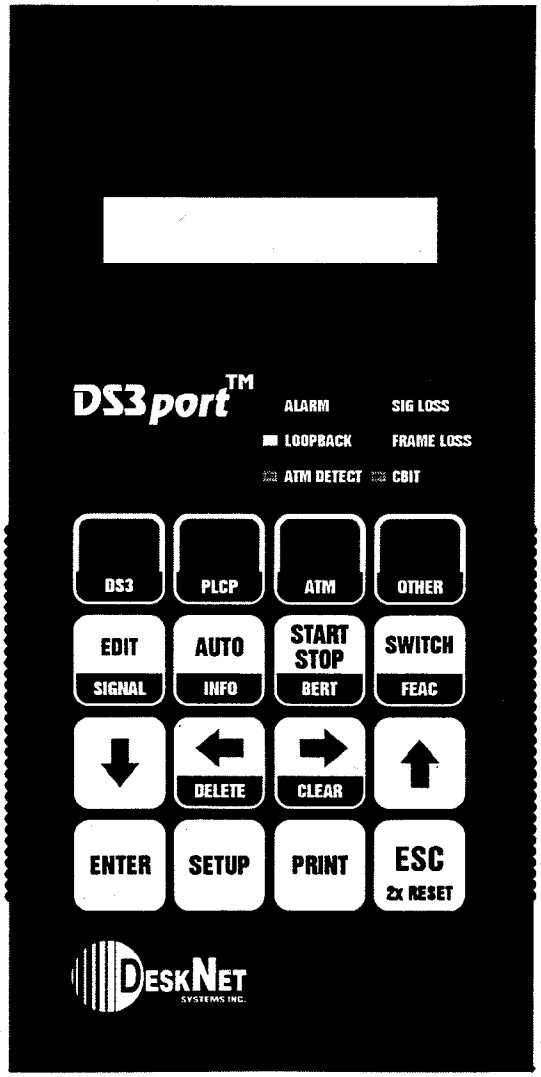
Please Note: *Please use caution when deleting stored test result. Once deleted they can never be recovered.*

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DS3port Operating Guide

Revision 1.0



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Introduction

DeskNet Systems...

Strongly advises our customers to read this operating manual. At a minimum the "Read This First" section should be read. The DS3port is a *comprehensive* network analyzer. To *effectively* use the DS3port, time must be set aside for Operating Manual study.

DS3port Operating Guide

Printing History

MARCH 1994	**Version 1.0 - Production Release**
December 1993	**Version 0.1 - Beta 3.0 Release**
October 1993	**Preliminary Edition**

New editions are complete revisions of the manual. Update packages are issued between editions. They contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update. The edition does not change when an update is incorporated.

Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correlation between product updates and manual updates.

Models, Serial Numbers, Software Revision

This manual describes the operation of the following DeskNet products. All Serial Numbers are covered by this manual.

- DS3port Craftsman, Software Revision "**PR 1.0**" or greater
- DS3port Dataman , Software Revision "**PR 1.0**" or greater

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Packing List

The following items are included with the DS3port (all models):

- DS3port Operating Manual
- AC Adapter/Charger
- Black Cordura Nylon Carrying Case
- DB-25 to RJ-11 converter and RJ-11 printer/computer cable.

If your DS3port package does not contain the items from the list above, please contact DeskNet Systems Inc. Customer Service.

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Warranty

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Warranty

The information contained in this document is subject to change without notice. DeskNet Systems makes no warranty of any kind with regard to this material, including but not limited to, the implied warranties or merchantability and fitness for a particular purpose.

DeskNet Systems shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

The DeskNet DS3port is warranted against defects in material and workmanship for a period of one year from date of shipment, except in the case of batteries and accessories as specified in the next paragraph. During the warranty period, DeskNet Systems will, at its option, either repair or replace products which prove to be defective.

Exceptions: DS3port battery and accessories are warranted for 90 days from the date of shipment

DeskNet Systems warrants that its software and firmware designated by DeskNet Systems for use with an instrument will execute its programming instructions when properly installed on that instrument. DeskNet Systems does not warrant that the operation of the instrument software, or firmware will be uninterrupted or error free.

Unauthorized Service

The installation of substitute parts or the installation of any instrument modification not authorized by DeskNet Systems is specifically forbidden. The performance of such unauthorized service will negate the instrument warranty or any maintenance agreements.

Return the instrument to DeskNet Systems Inc. for authorized service and repair.

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Obtaining Technical Assistance

Before Calling Technical Support

1. Check your DS3port Setup Options
2. Use the double ESC sequence to restart the unit.
3. Re-check the selected DS3port USER SETUP GROUP
4. Re-check your DS3port Setup Options
5. Try using the RESTORE FACTORY SETTINGS option.

When Calling Technical Support

Please provide DeskNet Technical Support with the following information:

1. Your Name and Company Name
2. DS3port Model
3. DS3port Serial Number
4. DS3port Software Revision that appears upon power-up.
5. Any Error Messages or Flags that appear on the Display.
6. Make, Model Numbers, and Configurations of Equipment Under Test.
7. When possible, a hand drawn image of the test configuration should be faxed to DeskNet before calling.
8. A printout of the DS3port's Setup Parameters.

Phone Numbers

1-800-DESKNET	DeskNet Toll Free Technical Support
1-914-273-6209	DeskNet Technical Support Fax
1-914-273-6232	DeskNet Sales and General Information

Toll Free Technical Support is only available to DeskNet customers who have purchased one or more DeskNet products. Technical support is available from 9:00 AM to 5:00 PM Eastern Standard Time.

Mailing Address

DeskNet Systems Inc.
84 Business Park Drive
Armonk, New York 10504

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Notices, Warnings, and Operating Restrictions

WARNINGS

1. This product complies with UL 1950 (2/26/93). This compliance has been certified for both the United States and Canada by ETL Testing laboratories and will carry the ETL listing mark.
2. This product meets the requirements of FCC Part 15 - Subpart A, electronics emission and susceptibility.
3. For protection from electric shock hazard, power cord ground must not be defeated.

Operating Restrictions

The following general safety precautions must be observed during all phases of operation, service and repair of this instrument. Failure to comply with these precautions or with specific warnings in this manual violate safety standards of design, manufacture, and intended use of this instrument. DeskNet Systems Inc. assumes no liability for the customers failure to comply with these requirements.

Environment

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

Service and Adjustment

Service and adjustment of this instrument is to be performed only by trained DeskNet Systems service personnel.

Electric Shock Hazard

Do not remove the system covers. To avoid electric shock, use only the supplied power module.

AC Adapter / Charger

Only the DeskNet supplied AC Adapter/Charger may be used with this equipment. Use of any other AC Adapter/Charger is expressly forbidden and will void all Warranty rights.

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The AC 110 volt socket-outlet shall be installed near the equipment and shall be easily accessible. Failure to have this outlet easily accessible may constitute a safety hazard.

Explosion Hazard

Do not operate the system in the presence of flammable gases.

Hazardous Material

Should the LCD display be damaged the liquid crystal material can leak. Avoid all contact with this material, especially swallowing. Use soap and water to thoroughly wash all skin and clothing contaminated with the liquid crystal material.

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Read This First

Using This Operating Guide

The DS3port User's Manual is a complete reference that describes how to operate the DS3port and provides detailed descriptions of various test procedures. It is not meant to be a DS3, or ATM tutorial; some familiarity with DS3, ATM and wide-area networking in general is required to effectively use the DS3port.

Operating Guide Organization

The DS3port Users Manual contains a few chapters on general product information, a series of "Quickstart" chapters with numerous test examples, a group of "Setup Option" chapters detailing all the programmable features of the DS3port, and two chapters dealing with test storage, retrieval, download and printing.

The fastest way to begin testing with the DS3port is to continue with this "Read This First" chapter and then go directly to the "Quickstart" testing chapter that best suites your needs. Once familiar with basic DS3port operation the Setup Options chapters should be referenced to understand all the capabilities of the DS3port.

A Word About Examples and Directions

The examples and direction contained in this manual assume that the DS3port is being operated for the first time, straight from the factory. It is important to understand that the DS3port contains many circular lists and menus and that the unit you are using enters these menus at the position last used (unless the tester has been RESET or Powered Off). These menus may not be in the same positions that are assumed in this manual. Simply use the arrow keys, ⇦⇨⇧⇩ to find the displays presented by the directions and examples should this occur.

"RESET"ing the DS3port

The DS3port can be RESET by pressing the ESC key twice within 1 second. This Reset function performs a self-test, reset, and leaves the user at the Top Level display. It is useful for placing the DS3port in a known state.

Please Note: *RESET does not restore factory default settings. To restore factory default settings you must select RESTORE FACTORY DEFAULTS from the General SETUP menu option list.*

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Using ESC

The DS3port keypad has an Escape key located in the lower right corner of its keypad. This key, when pressed once, returns you to the top level menu. Whenever you are finished with a particular function (i.e.. Setup, Monitor, Test) you can use the ESC key to return you to the top level. Pressing ESC twice in succession, as indicated above, resets the DS3port.

Low Battery Warning

The DS3port will begin flashing "LOW BATTERY" warnings on the top line of the display when the internal Ni-Cad battery has *60 seconds* of operating time left. Once this 60 second time expires the DS3port will cease to function. It is suggested that the 60 seconds be used to Store the current tests results. The DS3port may be connected to the supplied AC Adapter/Charger and recharged without 1st shutting it off.

Please Note: *The AC Adapter/Charger should never be disconnected while the DS3port is powered on. This may result in the corruption of current or stored tests results.*

Shortcut - Quick Display Switching

The DS3port usually maintains a large number of counters and other results in each of its MONITOR modes (i.e.. MONITOR DS3 has 42 result displays available. Scrolling between them using the ⇦⇨⇧⇩ keys can be tedious. The DS3port has a method for cycling between just the particular result displays that a user desires. To use the SWITCH display option:

1. Select the first display that you wish to view using ⇦⇨⇧⇩.
2. Press ENTER. A number, in this case 1, will appear on the right bottom display line. This indicates it will be the 1st display in the Switch list.
3. Select additional displays pressing ENTER to add them to the SWITCH list.
4. Now, simply press the SWITCH key to cycle between the selected displays.
5. EDIT DELETE will clear a displayed entry from the list. Subsequent EDIT DELETE key-presses will continue to clear the remaining elements from the list.

Please Note: *Quick Display switching is not available when viewing Alarms or FEAC information.*

Shortcut - Key-press's

A number of keypad shortcuts exist to help speed the experienced user during operation. It is not always necessary to press ESC, enter the top level, and then select a new function. Functions of the same type (i.e.. SETUP DS3, SETUP

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ALARMS, SETUP ATM or MONITOR DS3, MONITOR ATM) can be directly accessed by simply pressing the second selection key.

Examples of this:

❑ Normal Operation

- From the top menu press SETUP then DS3
- Setup you DS3 options then press ESC
- Press SETUP then ATM
- Setup you ATM options then press ESC

❑ SHORTCUT Key-press's

- From the top menu press SETUP DS3
- Setup your DS3 options then press ATM
- Setup your ATM options then press ESC

A Word About User Setup Groups

The DS3port internally stores four (4) distinct groups of User Setup Options labels SETUP 1 through SETUP 4. Each SETUP Group contains over two dozen configurable options. (Refer to "A Word About Setup Options" below.)

The DS3port uses only one (1) SETUP Group at any given time, but a different SETUP Group can be selected as described in the example below. Once a new SETUP Group has been selected the DS3port resets itself, this takes about 2 seconds, and begins using the setup options specified within the new SETUP Group.

Using SETUP Groups, it is possible to store up to four (4) different complete test configurations and switch rapidly between them. For example, a DS3port could contain the following SETUP Groups:

- SETUP 1 - Configured for a specific manufacturers DS3 ATM Switch
- SETUP 2 - Configured for pseudo random DS3 BERT testing
- SETUP 3 - Configured to loopback ATM Cells
- SETUP 4 - Used to test for the presence of management cell streams

Any time a particular Setup Option is changed within a SETUP Group it is saved only within that Setup Group. For Example, Setting DS3 Line Build Out ON in SETUP Group 3 *does not mean that it will also be set ON in SETUP group 1.*

Please Note: *Upon arrival from the factory, the DS3port has each of its SETUP groups programmed identical to the default settings specified within this operating guide.*

User Setup Group Example

To switch the active SETUP group to a new one do the following:

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1. From the Top Level DS3port Menu press the SETUP key. NOTE: the bottom display line now reports either "SET 1", "SET 2", "SET 3", or "SET 4" indicating the current SETUP Group.
2. Use ⇦ or ⇨ to select a new SETUP Group. Once the desired SETUP Group is displayed press the ENTER key.
3. The DS3port will now Beep, Reset, and re-configure itself based upon the options previously stored within the selected SETUP group.

A Word About Setup Options

The DS3port has over two dozen Setup options that configure the unit to operate in a variety of modes. These options are accessed by pressing the SETUP key *followed by a secondary* selection key. For example, SETUP followed by DS3 presents the DS3 Setup Option list for review and editing.

The Setup Options themselves are presented in a circular list which is accessed using ⇧⇩. As each Setup Option is displayed, on the top line of the display, the bottom line indicates the current setting for that option. The current setting is indicated by an asterisk (*) at the end of the second display line. Alternate settings for the option being viewed are selected in one of three ways depending on the type of Setup Option.

1. With some Setup Options a selection list is accessed using the ⇦⇨ arrows on the keypad. Once the new setting is displayed on the bottom line of the display the user selects it by pressing the ENTER key. An asterisk (*) will now appear at the end of the line.
2. Other Setup Options require the user to enter a numeric or text value. This is accomplished by pressing the EDIT key to enter the Edit mode. Edit mode is indicated by a flashing "E" in the upper right corner of the display. Once in Edit mode ⇦⇨ select the digit or character to change, ⇧⇩ changes the value of the digit or character. The changed value is then saved by pressing ENTER to Exit and Save the edited value. While in the Editor pressing the EDIT key again will Quit the Editor without updating the numeric or text value.
3. Finally other, more complex Setup Option are set using a combination of methods 1 and 2 above. ⇦ or ⇨ are used to display a selection which can also be Edited.

Setup Option Examples

❑ Changing a DS3 Setup Option using a Selection List. From the Top Level display:

- Press SETUP then DS3 to enter the DS3 Setup Option list.
- Use ⇧⇩ until "DSX XMT LN BLDO" is seen
- Notice it is set for "ON" indicated by the asterisk (*)
- Use ⇦⇨ to switch between the two options, ON or OFF

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- Stop when "OFF" is displayed
- Press ENTER to select "OFF"
- Notice the * appeared at the end of display line 2.
- Use ⇦⇨ and ENTER to change the selection back to "ON"
- Press ESC to exit the DS3 Setup Option list.

❑ Changing a Setup Option using the Editor. From the Top level display:

- Press SETUP and SETUP again to enter the General Setup Option list.
- Use ⇧⇩ until "TIME" is displayed
- Press EDIT to enter the Editor
- Use the ⇦⇨⇧⇩ to enter the correct time
- Notice the AM/PM indicator automatically adjust when you pass 12
- Press ENTER to Exit the Editor and Save your change

A Word About Automatic Framing Detection

The DS3port continuously performs automatic detection of the C-Bit or M13* framing formats. This analysis is not "fool-proof", if the application identification channel of an M13 signal is all 1's because of the lack of sub-rated signals then the DS3port will detect C-Bit Framing, *although it is not present*. This is a limitation inherent in the ANSI standards.

The following items characterize the operation of Automatic Framing Detection

- A **lit** CBIT LED on the DS3port front panel indicates that CBIT framing is being automatically detected and that the DS3port Framing Format setup option is set for CBIT operation.
- A **dark** CBIT LED on the DS3port front panel indicates that M13 framing is being automatically detected and that the DS3port Framing Format setup option is set for M13 operation.
- A **blinking** CBIT LED on the DS3port front panel indicates that the currently detected framing does not match the DS3 Framing Format setup option. In most cases DS3 Framing Format setup option should then be changed to match the received framing. (See SETUP OPTIONS - DS3)

Please Note: *Whenever ATM testing (transmission) is taking place the DS3port is forced to be in C-Bit framing, as required by all the ATM specifications.*

Please Note: ** M13 framing is the recognized industry standard term for what ANSI terms "M23 Framing Application". "M13" will be used throughout this document.*

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The DS3port

INTRODUCTION

Congratulations on your purchase of the DS3port handheld DS3 and ATM network analyzer. With the DS3port, you can quickly and easily test any part of a T3 network for proper operation. In addition, the DS3port provides the capability to test and analyze ATM services.

This manual describes the operation of the DS3port. We suggest that you read it carefully to become familiar with all the DS3port's features and testing procedures.

Capabilities

- Craftsman
  - Line Power Monitoring
  - Monitors All DS3 Framing and Pattern Errors
  - Generates DS3 Framing and Pattern Errors
  - Monitors and records All DS3 Alarms and Events
  - Generates DS3 Alarms
  - Provides Extensive DS3 Bit Error Rate (BER) Testing Capability
  - Provides Test Storage and Retrieval
  - Provides Test Result Printouts
- Dataman
  - Monitors PLCP Framing and Pattern Errors
  - Generates PLCP Framing and Pattern Errors
  - Provides PLCP BER Testing
  - Includes all Features of the Craftsman Model
  - Provides Extensive ATM Testing Capability:
  - Transmits up to 4 different Virtual ATM Cell Streams with user assignable bandwidth and payloads.
  - Allows Up to 4 user programmable ATM Header Filters.
  - Steady, Burst, or Round-Robin cell transmission.
  - Provides ATM Virtual Cell Stream BER Testing.
  - Automatic Discovery of Active Virtual Circuits

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DS3port Controls and Connections

The Front Panel

Figure 1 is a representation of the DS3port front panel, including the keypad, LCD display, and indicator LED's. A description of each key's function is also included.

- Keypad - The DS3port has a 16-key keypad that is color coded for ease of operation. Generally:
  - Two key-presses, the first selecting the function (i.e.. Monitor, Setup, Test) and the second selecting the protocol (i.e.. DS3, ATM, PLCP) are normally required when choosing an operation.
  - The blue keys in the top row begin specific tests.
  - The white keys help you select, setup and edit and control the flow of information on the display.
  - ⇦⇨⇧⇩ provide scrolling capabilities whenever lists or other information are displayed.
- Display - The DS3port has a 2 line by 16 character LCD Display.
- LED's - The DS3port has six (6) LED indicators built into its front panel. They function as follows:

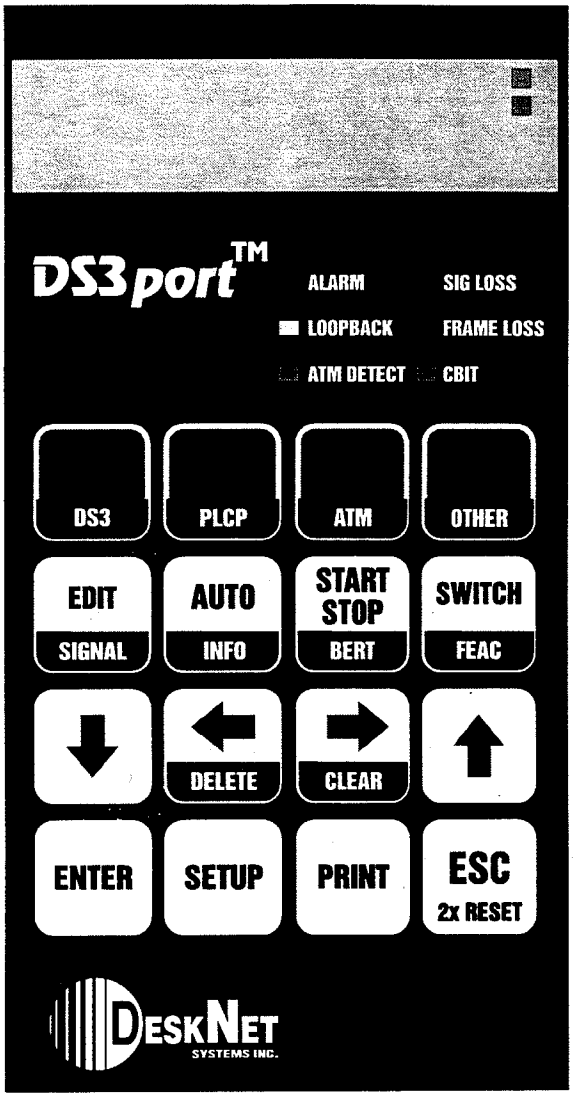
1. ALARM - lights whenever an alarm or event is detected and added to the Alarm list. This LED's will shut off whenever the current Alarm list is viewed by the user. New alarm or event occurrences will re-light this LED. See the ALARM monitoring chapter for more information. The ALARM LED Does NOT indicate the reception of FEAC signals. MONITOR FEAC must be used to view received FEAC codes.
2. LOOPBACK - lights whenever the DS3port is set to loop received DS3 payload or ATM cells from its receiver back through its transmitter. Loopback modes are used for In-Service testing.
3. ATM DETECT - lights whenever the presence of ATM cells is detected by the DS3port. This LED will not function when the DS3port is operating in DS3 or PLCP BERT modes.
4. SIG LOSS - when lit, indicates loss of signal power at the DS3 INPUT connection and/or a very low ones density causing "drop-out" of the DS3 signal.
5. FRAME LOSS - when lit, indicates loss of DS3 framing.
6. CBIT - this LED indicates three separate conditions:
   - LED ON - CBIT framed signal is being received and the DS3 Framing Format setup option is set to CBIT.
   - LED OFF- M13 framed signal is being received and the DS3 Framing Format setup option is set to M13.

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- BLINKING LED - the received framing does not match the framing set as the DS3 Framing Format.

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Figure 1: The DS3port Front Panel



Bouncing Ball Indicator

Backlit LCD Display.

Alarm and Status LEDs

KEYPAD

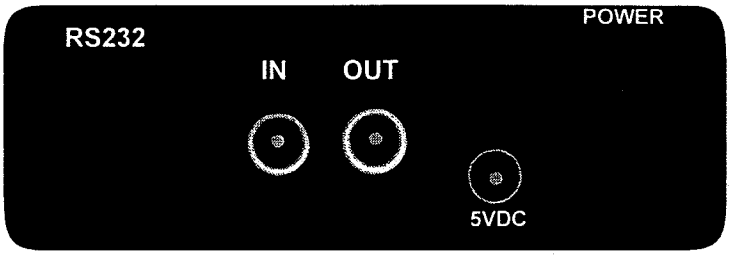
MONITOR	displays the error counters.
ALARMS	displays the Alarm List.
XMIT	starts transmission of ATM cells or DS3/PLCP Error Generation.
MEMORY	stores and retrieves test results.
DS3	
PLCP	
ATM	are all used as secondary selection keys.
OTHER	used to select optional features.
INFO	used with MONITOR to obtain DS3port info
EDIT	places the DS3port in Editor mode for use during Setup and with CLEAR and DELETE.
AUTO	allows the user to start one of the Automatic test modes.
START	
STOP	used in many varied ways.
SWITCH	used to quickly switch between displays.
SIGNAL	used after MONITOR to obtain the power level of the received DS3 signal.
ARROWS	allows movement through displayed lists.
BERT	used to begin Bit Error Rate Testing.
FEAC	used with MONITOR and XMIT to access Far End Alarm and Control functions.
DELETE	
CLEAR	used with EDIT to zero individual displays or groups of results.
ENTER	used to make selections and save changes.
SETUP	used to access the various setup parameters within the DS3port.
PRINT	used to obtain printouts or download results to a personal computer.
ESC	used to get to the top level of DS3port menus OR pressed twice to RESET the DS3port.

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The Connector Panel

Figure 2, is a representation of the DS3port connector panel, including the Power, RS232, and Network connectors. Please reference it as needed.

Figure 2, The DS3port Connector Panel



- 5VDC - input jack used to attach the AC Adapter/Charger supplied by DeskNet.
- RS232 - an RJ-11 female jack that accepts the DeskNet supplied serial conversion cable through which downloads to a PC or Printer are accomplished.
- Network Connections - BNC IN and OUT connectors that are attached to the DS3 network. OUT supplies a DSX transmit level with or without Line Build-Out. IN receives DSX, or DSX MON inputs.

Please Note: *DeskNet recommends that BNC cables at least 1 foot or longer be used to connect to equipment.*

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Quickstart - General

INTRODUCTION

The following "Quickstart" chapters will demonstrate the test capabilities of the DS3port by example. It is assumed the DS3port setup options are set as shipped from the factory and that a short coax cable is connected between the IN and OUT DS3 ports.

If you are unsure as to the SETUP option state of the DS3port you should restore it to the factory defaults as follows:

1. Press ESC to return to the Top Level menu.
2. Press SETUP and check that the correct SETUP Group is being used.
3. Press SETUP a second time to access the DS3port generic setup menus.
4. Use until "RESTORE FACTORY SETTINGS" is displayed.
5. Press ENTER and wait for the asterisk (*) to appear on display line 2.
6. Press ESC two times rapidly to RESET the DS3port.

Before beginning each of the various Quickstart sections press ESC once to insure that you start each section with the DS3port at its Top Level menu.

Fast Display Switching

The DS3port has many different result displays, switching between the few that you are interested in can be tedious. To eliminate this problem a shortcut display switching mechanism has been added. For example there are 42 separate DS3 error displays. The DS3port has a method for cycling between just the particular result displays that a user desires. Below is a demonstration of how to use the SWITCH display option to cycle between selected DS3 Error displays:

- ❑ Press MONITOR DS3 to enter the DS3 Error Displays. Select the first display that you wish to view using ⇧⇩.
- ❑ Press ENTER. A number, in this case 1, will appear on the right bottom display line. This indicates it will be the 1st display in the Switch list.
- ❑ Select additional displays pressing ENTER to add them to the SWITCH list.
- ❑ Now, simply press the SWITCH key to cycle between the selected displays.
- ❑ DELETE will clear a display entry from the list.

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Fast display switching is also available in all other MONITOR modes (i.e.. MONITOR ATM , MONITOR PLCP, Etc.).

"Freezing" Displays

Each of the result counters and displays can be "frozen" while being viewed by pressing the START/STOP key. This stops only the display, the actual results are still being acquired in the background. Pressing START/STOP again allows the result counter to resume displaying.

Clearing Monitor Counters and Counter Groups

Individual result counters can be reset to zero (0) by pressing EDIT and then DELETE or CLEAR while the counter is being displayed. This can be done even while the display is stopped. (See paragraph above.)

EDIT DELETE, performs the secondary function of removing a Switch List display from the currently active list.

Power ON

If you have not yet connected the cable between IN and OUT do so now and RESET the DS3port using Double ESC. You should see the following indications on the DS3port front panel:

1. After copyright and other notices the display will read "DS3port Select Function"
2. The red ALARM LED will be off.
3. The green ATM DETECT LED will be lit and the green CBIT LED will be lit. The "Bouncing Ball" will be moving.

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Quickstart - DS3 Network Testing

DS3 Power Monitor

The DS3port has the capability to measure the signal strength of the received DS3 signal. Two values are available for display:

1. Volts - Maximum voltage measured
2. dBm - power referenced across a 75 ohm load. 0 dBm corresponds to a DS3 Signal level of approximately 0.39 Vp.

To check the DS3port signal power from the top level menu press the SIGNAL key. Wait a few seconds and the power will be displayed. The ⇦⇨ keys can be used to cycle between Vp and dBm.

DS3 Error Monitoring

The following steps will show how to examine the various DS3 error displays.

Figure 3

BPV	COUNT
0	

1. Press MONITOR then DS3 (they are located on the same key).
2. You will be presented with a Bipolar Violation Count display similar to that in Figure 3.
3. BPV indicates that you are monitoring Bipolar Violations. COUNT indicates that an actual count of the violations is being displayed. "0" indicates that no violations have been recorded.

Figure 4

BPV	COUNT
327675	

4. Now loosen the IN BNC connector and remove and replace it a few times. This will cause bipolar violations and result in the count changing. Leave the connector attached. See Figure 4.
5. Now press ⇧ which will result in Figure 5, depicting the Errored Information Block count.

Figure 5

EIB	COUNT
327675	

6. Use ⇧ to scroll through the other error types. You will see F-BIT (Framing bit errors), P-BIT (Parity bit errors), C-BIT (C-Bit Parity errors), FEBE (Far End Block Errors), and DS3 TTL. Most of these counters should be non-zero and will move if the BNC connection is disturbed.

Figure 6

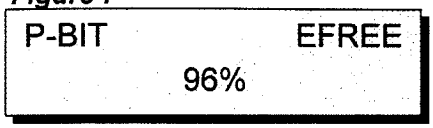
BPV	RATE
0 E/S	

7. You will also notice that the SIG LOSS (signal loss) and FRAME LOSS (framing loss) LED indicators will light whenever the connection is broken. The red ALARM LED should also light and stay on.

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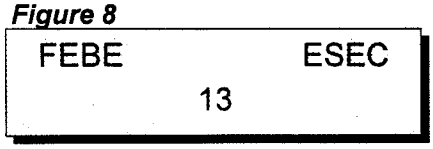
8. Now, press ⇩ and notice that you can scroll backwards through the displays you saw in the previous steps.

Figure 7



9. Now, press ⇨ the display changes as indicated in Figure 6. The error counter is replaced with a new display format. A RATE for the currently displayed error is shown indicating Errors Per Second (E/S) instead of an actual count.

Figure 8



10. Use ⇦⇨ and experiment with the other display types: AVER (Bit Error Average), ESEC (Errored Seconds), THSEC (Threshold Errored Seconds), and EFREE (Error Free Percentage). See Figure 7 and Figure 8 for some examples.

Please Note: *Errored Seconds is simply the total count of seconds in which one or more errors occurred. It does not reflect the availability or unavailability of service as required for the more strictly defined "Errored Second" of CCITT recommendation G.821. A G.821 analysis package is being prepared as an upgrade to the DS3port.*

DS3 Error Insertion and Alarm Generation

The DS3port can insert and generate 10 different DS3 errors and/or alarms conditions. In general errors can be set ON to send continuous errors, sent individually one error per user key-press, or turned OFF. Alarms can be turned ON or OFF by the user. All error generation is controlled with the following keys:

- START/STOP is used to turn continuous error transmission ON or OFF
- ENTER is used to send individual errors

Combinations of inserted errors and alarms can be sent as long as the combined conditions are not mutually exclusive, e.g. sending an AIS alarm will override the generation of an IDLE signal and CBIT framing error insertion. The following steps will demonstrate the operation of the DS3 Error and Alarm insertions capabilities.

Table I lists the 10 different Errors and Alarms that can be generated by the DS3port. Examples of error and alarm generation follow the table.

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Table I

Error or Alarm Type	Methods of Transmission	Description
BPV - Bipolar Violations	SEND ONCE	Causes a line code violation in the outgoing transmit stream.
FERF - Far End Receive Failure Alarm	OFF, ON	Sets the X1 and X2 DS3 overhead bits to 0, indicating a receive failure.
BLUE1 ALARM - Alarm Indication Signal	OFF, ON	Allows for the generation AIS BLUE alarm type 1. The DS3 payload is set a repeating 1010 pattern.
BLUE2 ALARM - Alarm Indication Signal	OFF, ON	Allows for the generation AIS BLUE alarm type 2. The DS3 payload is set a repeating 1010 pattern. All C-Bits are set to 0.
IDLES - the DS3 IDLE pattern "1100"	OFF, ON	Sends the 1100 IDLE pattern within the DS3 payload. Overridden by BLUE Alarms.
FEBE - Far End Block Error Indications	OFF, ON, SEND ONCE	Sends Far End Block Errors by setting the three FEBE bits to 0.
PBIT - Parity Bit Errors	OFF, ON, SEND ONCE	Inverts the PBIT Parity indication bits signaling a parity error.
FBIT - Framing Bit Errors	SEND ONCE	Inverts all 28 framing bits during of a DS3 frame.
Force DS3 OOF	OFF, ON	Forces DS3 Out-Of-Frame Condition
CBIT - CBit Parity Framing Errors	OFF, ON, SEND ONCE	Inverts the three CBIT parity indicators.
LOS - Loss Of Signal	OFF, ON, SEND ONCE	Simulates a loss of transmit signal.

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Please Note: ***Errors and Alarms can be independently turned ON and OFF. Multiple Error and Alarm conditions can be simultaneously generated. IF THEY ARE LEFT ON the other transmission test modes of the DS3port may NOT OPERATE. BECAUSE OF THIS a DS3port RESET (ESC ESC) or power down will RESET all ERROR and ALARM generation to OFF.***

Please Note: *AIS (Blue Type 1), AIS (Blue Type 2), and IDLE generation are mutually exclusive. Only one of these can be active at a given time. The last one activated using START/STOP will over-ride any others set on previously.*

Figure 9

```
SEND BPV  ERRS
```

1. The DS3 Error and Alarm insertion displays are accessed by pressing XMIT followed by DS3 which results in the display depicted in Figure 9. Once this display is visible pressing the ENTER key will send a single line code violation out of the DS3port. Each press of the ENTER key will result in another violation being sent.

Figure 10

```
SEND FERF  ERRS
```

2. Pressing ⇧ once results in the display show in Figure 10. Pressing the START key now will result in the constant generation of the FERF (X-Bit) alarm by the DS3port. This fact is indicated on the display after START is pressed by the letters ACTV (Active) in the lower right corner of the LCD as indicated in Figure 10.
3. You will notice that the red ALARM LED lights as soon as you activated FERF. Press STOP to turn off this alarm condition. ACTV will disappear. The ALARM LED remains on indicating that an alarm has been recorded and not yet viewed by the user. For more information see "*Alarm Detection, Storage, and the Alarm List*".

Figure 11

```
SEND BPV        ERRS
SEND ONCE
```

4. Now press ⇧ until the display show in Figure 11 is present. This display is used to send CBIT errors. As before use the ENTER key to send one single CBIT error. Every time ENTER is pressed you will see the message "SENT" displayed briefly on the bottom line indicating the error has been transmitted.

You can switch between the DS3 error counter displays and the DS3 error transmission displays by pressing ESC and then either MONITOR DS3 or XMIT DS3. Notice that the error counters (C-BIT, P-BIT, etc.) increment each time you send an individual error. If you turn error generation on, the counters run continuously.

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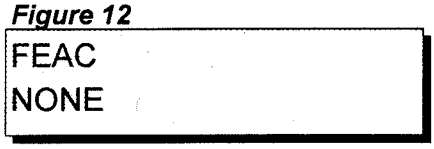
FEAC Testing

The DS3port can recognize and transmit all the Far-End Alarm and Control Signals used by C-Bit framed DS3 equipment to send alarm and/or status information from the far-end terminal back to the near-end terminal and to initiate DS3 and DS1 loopbacks at the far-end terminal.

FEAC Monitoring

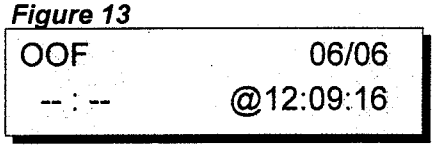
The DS3port records and maintains a list of the received FEAC codes and their duration. This list is assessable using the MONITOR FEAC keys. The following example shows how the FEAC list is accessed.

Figure 12



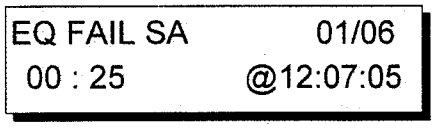
1. From the top level press MONITOR FEAC. If no FEAC Alarms of Control signals have been detected by the DS3port a display similar to Figure 12 results.

Figure 13



2. When FEAC Signals are received the DS3port FEAC display appears similar to Figure 13. That figure indicates that the DS3port has received 6 FEAC Alarm or Control Signals and that you are viewing number 6 or 6 which happens to be a DS3 Out of Frame Alarm. This alarm occurred at 12:09 and 16 seconds and is still occurring since its duration field is not yet filled in "--:--".

Figure 14



3. ⇧⇩ can be used to view the other FEAC codes received. Figure 14 shows a typical display indicating a DS3 Equipment Failure, Service Affecting, Alarm that occurred at 12:07 and 5 seconds and lasted for 25 seconds. Table II below, lists all the FEAC codes recognized by the DS3port and their display abbreviations.

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Table II

FEAC Alarm or Control Code	Display Abbreviation
DS3 Equipment Failure, Service Affecting	EQ FAIL SA
DS3 Loss-Of-Signal / High Bit Error Ratio	LOS HBER
DS3 Out-Of-Frame	OOF
DS3 AIS Received	AIS RCVD
DS3 IDLE Received	IDLE RCVD
DS3 Equipment Failure, Non-Service Affecting	EQ FAIL NS
Common Equipment Failure, Non-Service Affecting	COMMON EQP
Multiple DS1 Loss-Of-Signal / High Bit Error Ratio	MULTI DS1
DS1 Equipment Failure, Service Affecting	DS1 FAIL S
Single DS1 Loss-Of-Signal / High Bit Error Ratio	SINGLE DS1
DS1 Equipment Failure, Non-Service Affecting	DS1 FAIL N
Line Loopback Activation Displays For XMIT FEAC - this is actually a combination of a Line Loopback Activation Code + a line identifier code which results in the identified line being looped back.	ACTV LOOP - On top display line indicates Activate code will be sent when ENTER is pressed. DS3 LINE - Send activate code for the whole DS3 line DS1 LINE-No. x -Send activate code for DS1 line # x DS1 LINE-ALL - Send activate code for all DS1 lines
Line Loopback Deactivation Displays For XMIT FEAC - this is actually a combination of a Line Loopback Deactivation Code + a line identifier code which results in the identified line being removed from loopback.	DACTV LOOP - On top display line indicates Deactivate code will be sent when ENTER is pressed. DS3 LINE - Send activate code for the whole DS3 line DS1 LINE-No. x -Send activate code for DS1 line # x DS1 LINE-ALL - Send activate code for all DS1 lines
Line Loopback Activation Receive Displays for MONITOR FEAC	A DS3 LINE - Activate Loopback of the whole DS3 line A DS1 # 4 - Activate Loopback of DS1 line 4 A ALL DS1 - Activate Loopbacks of all DS1 lines
Line Loopback Deactivation Receive Displays for MONITOR FEAC	D DS3 LINE - Deactivate Loopback of the whole DS3 line D DS1 #4 - Deactivate Loopback of DS1 line 4 D ALL DS1 - Deactivate Loopbacks of all DS1 lines

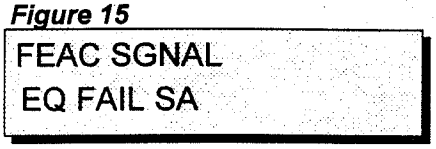
FEAC Transmission

The DS3port allows the user to transmit FEAC Alarm or Loopback Activation / Deactivation codes. As in all DS3port error or alarm generating modes an alarm or error is selected then turned ON or OFF using the START/STOP key or sent one time using the ENTER key. The following examples indicate how to send FEAC codes.

Please Note: *FEAC codes cannot be transmitted unless the DS3port's DS3 Framing Format option is set to CBIT or ATM Transmission is active (since this forces the DS3port to be in CBIT framing format).*

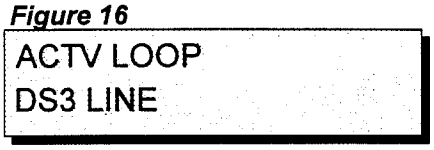
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Figure 15



1. To enter FEAC transmit mode press XMIT FEAC from the top level. A display similar to Figure 15 will result. It indicates that the DS3port is ready to transmit a DS3 Equipment Failure Service Affecting FEAC code. Pressing START/STOP will turn the continuous transmission of this code ON or OFF. The alarm code can be sent individually using the ENTER key. The work SENT will be flashed briefly on the display to indicate its transmission.

Figure 16



2. The ⇦⇨ Arrow keys can then be used to select the different FEAC signals to be sent. A list of these is presented in Table II.
3. To send Loopback Activation or Deactivation codes the ⇧⇩ Arrows keys are used until a display similar to Figure 16 is present. It indicates that a Activate Loopback code will be transmitted when ENTER is pressed. The second line indicates that the code for complete DS3 line loopback will be sent. The appropriate loopback code is selected using the ⇦⇨ Arrow keys. Again, reference Table II for the appropriate codes.

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Quickstart - PLCP Network Testing

PLCP Error Monitoring

Please Note: *You cannot monitor PLCP Errors if the DS3port is set to DS3 PAYLOAD LOOPBACK default operating mode. Once set to DS3 payload loopback the incoming information is turned directly around and any PLCP framing is not examined. Of course using PLCP BERT or ATM cell transmission will stop this mode of operation and the PLCP error counters will be activated.*

Please Note: *You can press MONITOR PLCP to view the error counters BUT they will not function if the DS3port is in DS3 payload loopback.*

The following steps will show how to examine the various PLCP error displays.

Figure 17

PLCP BIP8	COUNT
0	

1. From the top level menu press MONITOR then PLCP. You will be presented with a PLCP Bit Interleaved Parity Error Display similar to Figure 17.

Figure 18

PLCP BIP8	COUNT
152	

2. The display is presenting a count of the number of Bit Interleaved Parity Errors detected by the DS3port. If a signal is present at the DS3port receiver, "jiggling" the coax input to the DS3port will cause BIP 8 errors to be recorded and a display similar to
3. Figure 18.
4. There are 4 different PLCP errors that the DS3port tracks. Each is selected using ⇧⇩. They are:

Figure 19

PLCP FRAM	RATE
3 E/S	

- BIP8 - Bit Interleaved Parity Errors
- FRAM - PLCP Framing Errors
- FEBE - PLCP Far End Block Errors
- TTL - a numeric total of the above results

Figure 20

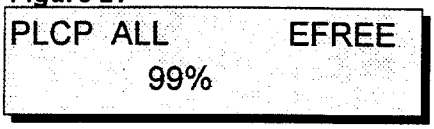
PLCP FEBE	AVER
1.0 E -3	

5. PLCP errors can be displayed in one of four formats. Each is selected using ⇦⇨. They are:

- COUNT as the number of actual numbers
- RATE in errors/second

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Figure 21



- AVER as a rolling average since the monitoring began
- EFREE error free percentage operation.

6. Figure 19, Figure 20, and Figure 21, depict a few of the potential PLCP error displays.

PLCP Error Insertion and Alarm Generation

The DS3port can insert and generate 6 different PLCP errors and/or alarms conditions. In general errors can be set ON to send continuous errors, sent individually one error per user key-press, or turned OFF. Alarms can be turned ON or OFF by the user. All error generation is controlled with the following keys:

- START/STOP is used to turn continuous error transmission ON or OFF
- ENTER is used to send individual errors

Combinations of inserted errors and alarms can be sent as long as the combined conditions are not mutually exclusive. The following steps will demonstrate the operation of the PLCP Error and Alarm insertions capabilities.

Table III lists the 6 different Errors and Alarms that can be generated by the DS3port. Examples of error and alarm generation follow the table.

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Table III

Error or Alarm Type	Methods of Transmission	Description
YELLOW - PLCP Yellow Alarm	ON, OFF	Controls the value of the yellow signal bit in the G1 path status octet of the PLCP frame.
P-FEBE - PLCP Far End Block Errors	ON, OFF, SEND ONCE	Inserts FEBE errors in the PLCP transmit stream.
BIP-8 - PLCP Bit Interleaved Parity 8 Bit	ON, OFF, SEND ONCE	Inserts Bit Interleaved Parity errors in the transmit stream.
P-FE - PLCP Framing Errors	SEND ONCE	Inserts PLCP frame alignment errors by inducing single bit errors in the PLCP A1 and A2 framing octets.
PLCP OOF - Forces the PLCP Out-of-Frame	ON, OFF	Inserts continuous errors in the A1, A2 framing octets so that the PLCP receiver will be forced out of frame.
POI-P - Path Overhead Identification Parity	ON, OFF, SEND ONCE	Inserts parity errors in the path overhead identification (POI) octets located in the PLCP frame.

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Quickstart - Automatic Testing

The DS3port has a variety of Automatic, or self-running, test modes. All are accessed by pressing the AUTO key from the top level menu, selecting a test using ⇧⇩, and pressing ENTER. The following sections describe these tests and demonstrates their operation.

Automatic Tests, Full Scan

This test automatically discovers all active virtual circuits present on an ATM link. It does this by systematically changing the DS3port's receive filters and don't care conditions until all areas of cell activity have been isolated and identified. When using FULL SCAN please remember the following:

1. There must be sufficient activity on a virtual circuit to guarantee its discovery. All Scanning tests allow the selection of Fast, Medium, Slow, and User scan times. Faster scans will miss activity on virtual circuits that have a slow periodic rate of occurrence. The SCAN TIME value used under the USER setting can be programmed as an Automatic Test Setup Option. Setting large SCAN TIME values (see *"Automatic Testing Setup Options"*) will allow for the detection of cells which arrive at a very low rate but will result in longer times to complete the scan.
2. This test is best suited for networks where no knowledge of the virtual circuit configuration is available. If the range of possible virtual header values is bounded the Bounded Scan (BNDED SCAN) should be used.

Please Note: *To detect Round-Robin ATM transmission SLOW scans must be used.*

The Full Scan operates as follows:

Figure 22

AUTOMATIC	TESTS
FULL SCAN	F

1. From the top level menu press AUTO. You should see a display similar to Figure 22. (If FULL SCAN is not showing use ⇧⇩ until it appears.) The "F" indicates that a Fast Scan has been selected. ⇦⇨ Allows selection of "M"edium, "S"low, or "U"ser defined test speeds. Press ENTER to begin the scan.

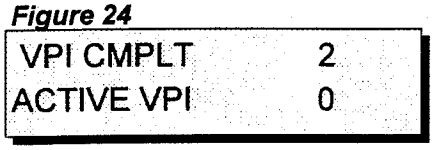
Figure 23

SCAN VPI's	1
LAST VPI : 3	<>

2. After pressing ENTER you will see a display similar to Figure 23. It indicates that the DS3port is scanning for activity within virtual paths. A flickering symbol in the lower right corner indicates that the scan is progressing. The number in the upper right side of the display increments for each virtual path in which activity is found. The bottom line indicates that activity was last detected on VPI 3.

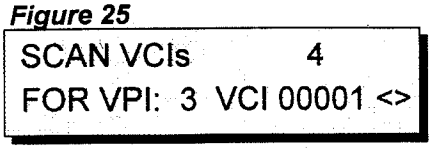
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Figure 24



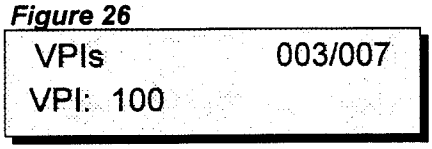
3. After scanning for VPI activity the DS3port indicates on the top display line that it has completed the VPI scan, the number of active VPI's found and on the bottom display line the actual VPI's on which activity was detected. A display similar to Figure 24 will appear for a brief instant. The DS3port now begins the second step of Full Scan, VCI search.

Figure 25



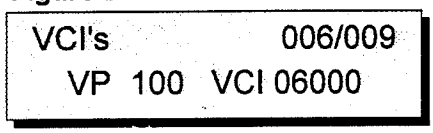
4. Displays similar to the VPI progress displays track the progress of the VCI activity search. A display similar to Figure 25 indicates that VCI scan is underway, in this instance, within VPI 3. Each VPI detected during step 3 above will be scanned during this step.

Figure 26



5. Once complete the DS3port stores two activity lists that are available for the user to view. The VPI activity list is entered at the end of a scan. It displays each VPI found as shown in Figure 26. The upper right pair of numbers indicates that you are viewing VPI 3 of 7 on which activity was found. Use the ⇦⇨ **arrows** to scroll through the list of active VPI's.

Figure 27



6. The DS3port also maintains a list of VPI VCI activity. Use the ⇧ arrow to see the VPI VCI activity list (⇩⇧ arrows switch between the two lists). Figure 27 indicates that VPI/VCI activity pair 6 of 9 found is being viewed. Again, use the ⇦⇨**arrows** to scroll through the list of active VPI/VCI pairs.

Automatic Tests, Bounded Scan

The Bounded Scan operates exactly as detailed in the Full Scan ATM activity search with one exception. When Bounded Scan is selected the DS3port uses the VPI RANGE and VCI RANGE values, configured as Automatic Tests Setup Option parameters, to limit the address range over which the DS3port searches.

Bounding the address space to search provides for a much quicker test time.

Automatic Tests, Full Scan VPI

The Full Scan VPI test operates exactly as detailed in the Full Scan ATM activity search but stops the search process once all the active VPI's have been located. No attempt is made to locate the individual VCI's active within each virtual path. It is very fast.

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Automatic Tests, Bounded Scan VPI

The Bounded Scan VPI test operates similar to the Full Scan VPI above but uses the VPI RANGE values, configured as Automatic Tests Setup Option parameters, to limit the VPI search range. It is the fastest ATM activity test available on the DS3port.

Automatic Tests, Review Scan

The Review Scan option in the AUTO menu allows a user to view the last scan results stored by the DS3port. Pressing ENTER with REVIEW SCAN displayed allows the user to cycle between the VPI and VPI/VCI scan result lists.

Automatic Tests, Fast Interleave ATM Transmission (FAIT) Testing

The following FAIT tests send ATM cells, formatted as setup in TXMIT HDR #1, at the Utilization percentages noted. Unlike Round-Robin or Burst transmission the Header 1 cells are interleaved with UNASSIGNED ATM cells at a much higher rate that is possible using Round-Robin. (Round Robin cell header updates are performed every 100 ms so that on the average over a 2 second period the Utilization specified is met.) FAIT transmission switches the Header 1 cells with UNASSIGNED cells at a much faster rate. These tests are useful when checking ATM switch cell buffer overflow, performance and traffic policing. However please note the following:

- This method of cell transmission requires ALL the internal resources of the DS3port. Because of this, NO OTHER testing or monitoring can be performed while the DS3port is transmitting in this mode. Once entered a single ESC is required to remove the DS3port from FAIT mode.

There are 9 different FAIT tests available as indicated in the list below. Also indicated is the exact number of Header 1 / Unassigned cells transmitted in continuous sequence. To begin a FAIT test select the test with the ⇦⇨ arrows then press ENTER.

	HDR#1 Cells	Unassigned Cells	Utilization
1. FAIT 99% UTIL	49,500	500	.990
2. FAIT 85% UTIL	4,000	700	.851
3. FAIT 80% UTIL	3,000	700	.811
4. FAIT 75% UTIL	1,500	500	.750
5. FAIT 67% UTIL	1,000	500	.666...
6. FAIT 50% UTIL	500	500	.500
7. FAIT 33% UTIL	500	1,000	.333...

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8. FAIT 25% UTIL	500	1,500	.250
9. FAIT 1% UTIL	500	49,500	.010

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Quickstart - Alarm Detection, Storage, and the Alarm List

Alarm Detection

The DS3port maintains a history of alarms and events that occur during operation. Table 4 list the types of alarms and events that are detected by the DS3port.

Table 4

	List of Detected Alarms and Events
1	LOS - Indicates Loss of Signal
2	OOF - Indicates Out-of-Frame Condition
3	AIS - Indicates BLUE Alarm Reception
4	IDLE - Indicates IDLE "1100" Pattern Reception
5	FERF - Indicates X-Bit (Far End Received Failure) Reception
6	CBIT - Indicates Change in Application Identification Channel
7	COFA - Indicates Change of Frame Alignment Event
8	YEL - Indicates PLCP Yellow Alarm Reception
9	FEI - Indicates PLCP Framing Octet Error
10	BIP - Indicates that PLCP BIP-8 has been detected
11	PLST - Indicates PLCP Link Status Code Change
12	FEBE - Indicates PLCP Far End Block Errors have occurred
13	LOF - Indicates loss of DS3 Framing Event
14	POOF - Indicates PLCP Out-of-Frame Event

Any time one or more of these alarms occurs the red ALARM LED will light. The alarm and its start time will be stored in the DS3port's Alarm List and the DS3port will begin timing its duration. The DS3port will record up to 32 different alarm events. Once this limit is reached no further alarm events will be recorded until the current alarm list is cleared.

Please Note: *When the DS3port is in DS3 Payload Loopback operation all PLCP alarms should be ignored. If necessary the PLCP alarms and error monitoring can be disabled from the SETUP PLCP menu to eliminate PLCP alarms whenever the DS3port is in this operating mode.*

Figure 28

```
ALARMS
NONE
```

1. The DS3port's Alarm List is viewed by pressing the ALARMS key from the top level menu. If no Alarms are present the display will be similar to that shown in Figure 28.

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2. Viewing the Alarm List causes the ALARM LED to turn OFF. If additional Alarms occur the ALARM LED will once again turn ON. In this way the ALARM LED indicates to the user the presence of additional ALARMS.
3. Using a DS3port with a loopback cable attached press ESC ESC to RESET the tester.
4. Disconnect the attached loopback cable causing a loss of signal and note that the ALARM LED lights. Press the ALARMS key to view the Alarm List display as shown in Figure 29. NOTE: the ALARM LED will go OUT.
5. The upper right hand corner holds two numbers divided by a slash (/). The first number is the number of the Alarm you are viewing in the list. The second number shows the total number of Alarms stored in the list.
6. Figure 29 shows that you are viewing Alarm #1 in a list of only 1 Alarms. If instead the numbers had been 013/032 you would be looking at Alarm 13 out of 32.

Figure 29

LOS	001/001
-- -- : -- --	@13:00:00

7. The top left side of the display shows the type of Alarm recorded. In this case it is LOS or Loss of Signal. (This is expected since nothing is connected to the DS3port)
8. The lower right side of the display shows the time at which the Alarm occurred, in this case 13:00 or 1:00 P.M. The lower left side of the display shows the duration of the Alarm in HOURS:MINUTES format. In this case, Figure 29, shows "--:--", indicating that the Alarm is still "open". This means that the Alarm is still present and active.

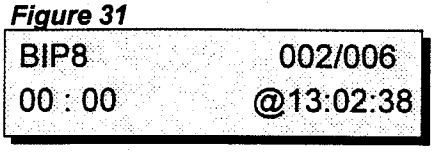
Figure 30

LOS	001/006
02 : 38	@13:00:00

9. Now, take a loopback cable and connect the DS3port transmitter (OUT) to its receiver (IN). Connect and disconnect the cable a few times to cause additional alarms. After the loopback is connected the SIG LOSS and FRAME LOSS LED will go OUT but the ALARM LED will turn ON again. You should be left with a display similar to Figure 30.
10. Figure 30 indicates that the DS3port has now stored an additional 5 Alarms (a total of 6 are stored). It also indicates that Alarm 1, the currently viewed LOS alarm, had ceased (been "closed") after 2 minutes and 38 seconds.
11. Use the UP and DOWN Arrows to scroll through the remaining Alarms in the list. When you reach the last Alarm, in this case Alarm 6, the list will begin again from the bottom. Your displays will differ in some respects but the following displays are typical of the results you should see.

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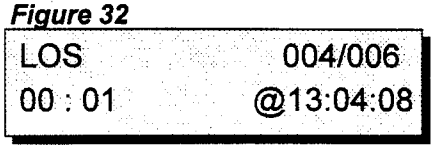
Figure 31



12. Figure 31 indicates Alarm 2 of 6 was a BIP8 or PLCP Interleaved Parity Error event that began at 13:02:38 (1:02 PM and 38 seconds). It lasted less than a second indicated by the duration of 00:00.

Please Note: *Duration's of 00:00 indicate alarms or events that occurred for a fraction of a second.*

Figure 32



13. Figure 32 indicates that Alarm 4 of 6 was another LOS (loss of signal) that began at 13:04 and lasted 1 second. This was caused by inserting and removing the cable connections.

To clear out the DS3port's Alarm List press EDIT and CLEAR. This will result in a display as indicated in Figure 28. This *deletes the complete* Alarm List.

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Quickstart - Bit Error Rate Testing

DS3 BERT Testing

The DS3port has the capability to transmit BERT test patterns, defined in the default BERT setup (refer to *"BERT Setup Options"*), within the DS3 payload. This is a BERT pattern that is surrounded DS3 framing information.

Please Note: *The DS3port must receive a BERT pattern from another source, usually a DS3port or itself (via looping back the complete DS3 stream), in order to analyze the BERT measurements correctly.*

Please Note: *When in DS3 BERT the ATM CELL DETECT LED ceases to operate.*

The following steps describe the operation of DS3 BERT. It is assumed that a loopback cable is attached from the OUT to the IN jacks on the DS3port connector panel. It is also assumed that a default BERT pattern and NO ERROR Injection has been selected within BERT Setup.

Figure 33

DS3 BERT
NO ERRORS

1. From the TOP Level Menu press BERT then DS3. The display should look like Figure 33. The DS3port is now transmitting the selected BERT pattern in the DS3 payload and has detected it and indicates that NO ERRORS have been detected.

Figure 34

DS3 BERT LOS
NO ERRORS

2. Now, remove the loopback cable and the display will indicate that the DS3port has lost signal (there is an LOS in the upper right side of the display). See Figure 34.

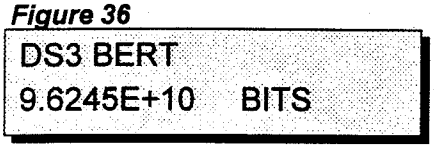
Figure 35

DS3 BERT
9.6245E-07

3. Now replace the connector, but "jiggle" it slowly back into place to cause errors at the receiver. This may take a few attempts. The BERT display will now show a calculated error rate similar to Figure 35.
4. The Error Rate shown in the lower left corner will be constantly *decreasing* in this case. This occurs because the BERT errors occurred in a burst when the cable was reconnected and the DS3port is calculating a moving average BERT error over time by dividing the number of errors by the total number of bits being received. Since no more errors are occurring BUT more bits are being received the resultant ERROR rate decreases.

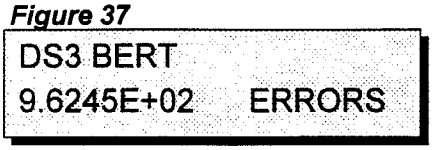
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Figure 36



5. Press ⇦ and a display similar to Figure 36 shows a count of the number of correct bits received since the BERT was started. This number should be increasing rapidly.
6. Press ⇦ key again, and a display similar to Figure 37 shows a count of the number of errored bits received since the start of the test. This number should be low and should not be moving anymore (it only counted when the connector was jiggled).

Figure 37



7. EDIT and CLEAR can be used to reset any of these displays to zero. Clearing the error count will cause the DS3port to return to a "NO ERROR" display as shown in Figure 33.

Please Note: *Two DS3ports may be used to test an individual DS3 circuit but care must be taken to specify the same BERT patterns within the BERT SETUP options. If this is not done the receiving DS3port will NEVER frame itself to the incoming BERT signal.*

PLCP BERT Testing

PLCP BERT operates similarly to DS3 BERT described above. The BERT pattern is transmitted within the 125 microsecond PLCP frame.

To select PLCP BERT, from the top level menu, press BERT and then PLCP.

Please Note: *When in DS3 BERT the ATM CELL DETECT LED ceases to operate.*

ATM BERT Testing

ATM BERT operates similarly to DS3 BERT described above. The BERT pattern is transmitted within the ATM cell structure using TRANSMIT HEADER #1's settings for VPI and VCI Virtual Cell streams. The DS3port uses ATM Receive Filter #1's header to recover the BERT pattern.

Please Note: *Receive Filter 1 must be setup so that the ATM cells arriving with the BERT pattern MATCH its value. If this is not done the DS3port will not be able to perform ATM BERT analysis.*

To select ATM BERT, from the top level menu, press BERT and then ATM.

ATM BERT will operate at 100% bandwidth if whenever Constant Header one is selected as the Cell Generation method. To use less than 100% of the bandwidth for ATM BERT the following 4 steps must be taken:

1. TXMIT HEADER #1 payload must be set to BERT PAYLOAD using the EDIT BERT keys when editing the TXMIT HEADER 1 payload.
2. Turn on ROUND-ROBIN ATM Cell Generation mode.
3. Activate Round-Robin with XMIT ATM.

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4. View the ATM BERT Results by pressing BERT ATM.

Please Note: *You must not enter ATM Monitor Mode (Using MONITOR ATM) or ATM BERT of Less than 100% will stop functioning. In order to restart partial ATM BERT you must repeat steps 3 and 4 above.*

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Quickstart - ATM Network Testing

ATM Testing

In this section you will learn how to view ATM results, setup Receive Filters, setup ATM Cell Headers, and the different ATM Cell transmission modes that are supported by the DS3port. To start Press ESC to get to the Top Level.

Monitoring ATM Cells

Please Note: *You cannot monitor ATM Cells if the DS3port is set to a default operation mode of DS3 PAYLOAD LOOPBACK and you have not run any ATM tests. Note: the LOOPBACK LED is a partial indication of this since it is lit whenever DS3 Payload Loopback is selected.*

To monitor ATM cells, from the Top Level menu do the following:

1. Press MONITOR and then ATM. You will see a display similar to Figure 38. It depicts the count of ATM cells that were received with Incorrect Header Checksums (HCERR).

Please Note: *Unlike other examples elsewhere in this manual you cannot generate HCERRs by disconnecting and re-connecting the BNC input cable.*

Figure 38

```
ATM HCERR    COUNT
             0
```

2. Pressing ⇧ changes the display to show the number of ATM Cells received that *match* the current Receive Filter, FLTR1. This number will be increasing steadily, since the factory settings cause the DS3port to transmit continuous unassigned cells (VPI=0 VCI=0, rest of the header=0). Also the Receive Filter is factory set to match VPI=0, VCI=0. See Figure 39.

Please Note: *The HCERR counter overflows at 20,475 cells per second. If Header errored checksums arrive at a rate greater than this they will be ignored. They will also NOT be counted by the total TTL counter.*

Figure 39

```
ATM FLTR1    COUNT
32367883
```

3. Press ⇧ to display Receive Filter 2's (FLTR2) Cell Count display. Since the Filter is not selected the display indicates NOT ACTIVE. See Figure 40.

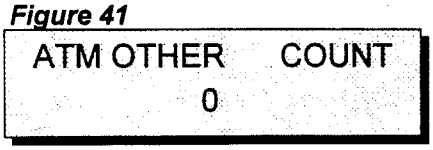
Figure 40

```
ATM FLTR2    COUNT
NOT ACTIVE
```

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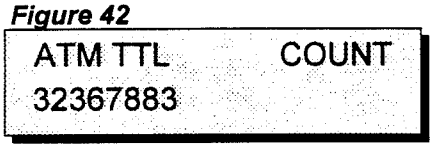
4. Using ⇧ three more times you will pass similar displays for Receive Filters 3 and 4 and finally arrive at the display indicated in Figure 41. This "OTHER" display shows all the received cells that *do not match* the currently active Receive Filter. In this case it will show zero (0) since all transmitted cells match Received Filter 1. See Figure 39.

Figure 41



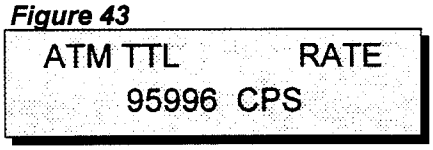
5. Press ⇧ again to display the TTL (Total) Cell count. In this case it should be the same as FLTR1's count. The Total count reflects the overall count of received cells in Filters 1-4 and HCERR. See Figure 42.

Figure 42



6. Press ⇨ to change the display type from an actual count to a rate. This display shows the rate of cell reception in cells per second. See Figure 43.

Figure 43

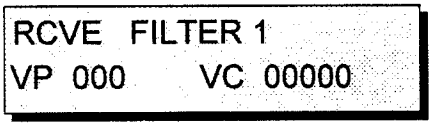


7. Removing the cable will stop the counters and the DS3port will display NOT VALID (since the DS3port has lost signal and CBIT framing). Restoring the cable connection will restart the counters.

Changing the Receive Filter

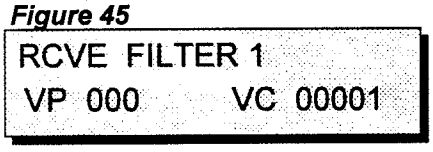
1. Press ESC, to enter the Top Level menu, then Press SETUP and ATM to enter the ATM Setup Options displays. Scroll using ⇧⇩ until "RCVE FILTER 1" is displayed.

Figure 44



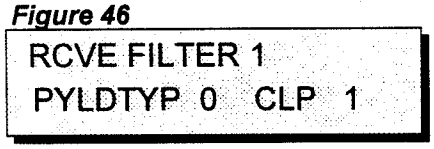
2. The first display seen, shown in Figure 44, displays the Receive Filters VPI, VCI setting. Change this setting by entering the Editor (press EDIT) and using ⇦⇨⇧⇩ to select and change the VPI/VCI as indicated in Figure 45, VPI=000 and VCI=00001. Press ENTER when done.

Figure 45



3. Use ⇨ to select the Payload Type and Cell Loss Priority (PYLDTYP and CLP) display for the Receive Filter. Edit these values, by pressing EDIT, as shown in Figure 46 , PYLDTYP=0 and CLP=1. Make sure to press ENTER when done to exit and save the changes made in the Editor. Now ESC to the top level menu.

Figure 46



4. Now view the ATM counters using MONITOR ATM. The only counters that should be active are OTHER and the TTL. The Receive Filter 1 counter is 0 since the received cells *do not match* the new Receive Filter 1 value.

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Changing the Transmit Cell Header

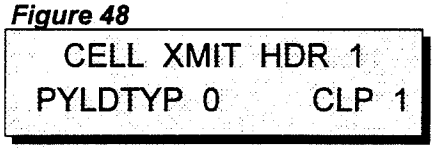
1. We will now change the currently transmitted cell header to the same settings as Receive Filter 1 set above. Use ESC to get to the top level, then SETUP ATM, and find the CELL XMIT HDR 1. It should be set as in Figure 47.

Figure 47



2. Use the Editor to change the VC indication to "00001". Remember to Press ENTER when done Editing. Now use ⇨to view the Payload Type and Cell Loss Priority Settings. Again Edit the CLP to a "1". Save your changes with ENTER. The display should resemble Figure 48.

Figure 48



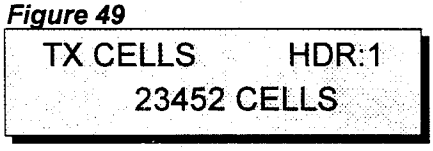
3. Use ESC MONITOR ATM to return to the ATM counter display. Only the OTHER and TTL counters are running. *This doesn't seem to make sense since we just changed the transmitted header to match Receive Filter 1, but Receive Filter 1 is not counting!* We must *activate* the new settings as demonstrated in the section below.

Please Note: *Changes to most ATM Cell Transmit Setup parameters DO NOT TAKE EFFECT immediately, you must use TXMIT ATM to begin transmission with the new parameters. This protects the user from sending incorrectly formatted cells into the network.*

Please Note: *Read the preceding note AGAIN - its important!*

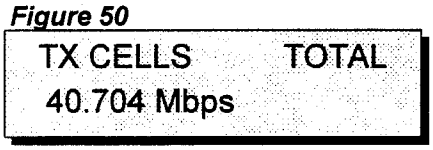
Activating ATM Cell Transmission

Figure 49



1. Press ESC to return to the top level. Press TXMIT ATM to begin transmission of cells with the new parameters. This display will look like Figure 49. It shows a count that ATM cells are being transmitted using the header defined in TXMIT HDR 1.
2. ⇧ can be used to view the transmit cell counts for headers 2-4. The ⇦⇨ Arrows can be used to view the transmit count in percent of the total bandwidth or in Mbps.

Figure 50



3. Use ⇦⇨⇧⇩ combinations until the display looks like Figure 50. This display indicates that ATM cells are being transmitted at the full DS3 rate of 40.7 Mbps.
4. The TXMIT ATM screens will always allow you to see the number of cells of each header being transmitted.

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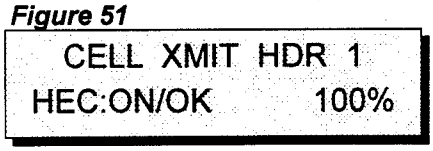
5. The STOP / START key may be used from any XMIT ATM display to control cell generation. If STOP is pressed then the current ATM transmission is halted and UNASSIGNED cells are generated continuously. Pressing START will re-start the previously interrupted transmission mode.

Round-Robin Multiple Header Transmission

This section describes how to setup three (3) separate transmit headers with different values and assign a portion of the overall bandwidth to each. Using the Receive Filters each separate cell stream can be counted and compared with the overall bandwidth.

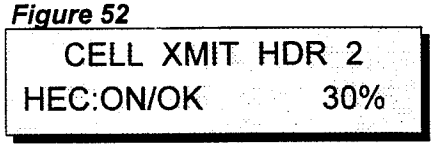
1. Press ESC SETUP ATM to re-enter the ATM Setup Menu. Find CELL XMIT HDR 1 using UP/DOWN Arrows. Make sure its VPI VCI settings are VPI=000 and VCI=00001.

Figure 51



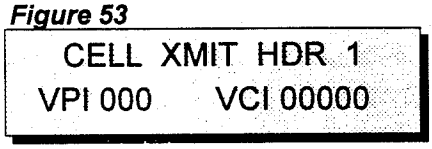
2. Now press ⇦ or ⇨ until the Header Checksum / Bandwidth screen is displayed as in Figure 51.
3. Press EDIT and ⇨, then use the ⇩ to select 30% bandwidth allocation for Header 1. Press ENTER to save this change. See Figure 52.

Figure 52



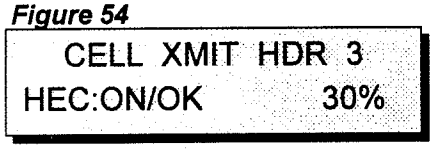
4. Press ⇧ to view the bandwidth for Header 2. Edit it to be 40%. (Remember to Press ENTER) Use ⇦ twice to view Header 2's VPI, VCI settings. They should be set to "000" and "00000". Leave them this way. See Figure 53.

Figure 53



5. Press ⇧ to view Header 3's VPI, VCI settings. Change them to VP=000 and VC=00003. Use ⇨ twice to view Header 3's bandwidth setting and edit it to 30%. (Remember to Press ENTER) See Figure 54.

Figure 54



We have now setup three different ATM cell headers with the characteristics shown in **Table 5**: (Review them within SETUP ATM using ⇦⇨⇧⇩ and if necessary Edit them until they match **Table 5**.)

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Table 5

Header	VPI	VCI	Payload Type	Cell Loss Priority	Bandwidth
HDR 1	"000"	"00001"	0	1	30%
HDR 2	"000"	"00000"	0	0	40%
HDR 3	"000"	"00003"	0	0	30%

Figure 55

```
CELL      GENERATION
HDR 1:    CONSTANT
```

6. It is now necessary to set the DS3port for ROUND-ROBIN Transmission so that the three header setup above will be sent. Within the ATM SETUP menus find the CELL GENERATION display. It is currently set for constant generation of HDR 1. See Figure 55.

Figure 56

```
CELL      GENERATION
ROUND ROBIN          *
```

7. Select ROUND-ROBIN using ⇨ and then Press ENTER. See Figure 56.
8. Use ESC to return to the Top Level. To start ROUND-ROBIN transmission Press TXMIT then ATM. You will see a display showing the total number of ATM cells being transmitted as described above.
9. Use ESC to enter the Top Level and SETUP ATM to view the ATM Setup Options. Now find and edit Receive Filters 1 to 3 so that they match Transmit Header 1 to 3. Make sure each of the 4 header fields is filled in correctly (VP VC PYLDTYP and CLP).

Figure 57

```
ATM FLTR1      RATE
     28800 CPS
```

10. Press ESC and MONITOR ATM to view the ATM counters. Use ⇧⇩ until ATM FLTR1 is showing. Use ⇦⇨ and view the count, rate, bandwidth, and percentage bandwidth of ATM cells received that match Receive Filter 1. See Figure 57, Figure 58, and Figure 59.

Figure 58

```
ATM FLTR1          BW
12.2100 Mbps
```

11. Notice that all four representations of Receive Filter 1's counters indicate equivalent values for ATM cell reception at a 30% rate that was set for TXMIT HDR 1.

Figure 59

```
ATM FLTR1          %BW
30.00%
```

12. Now use ⇧ to display Receive Filter 2's counts. The display will indicate "NOT ACTIVE". Press the SETUP key to activate Receive Filter 2. Use ⇦ or ⇨ to change the display format and notice that it matches the 40% value setup for TXMIT HDR 2. See Figure 60, Figure 61, and Figure 62.

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Figure 60

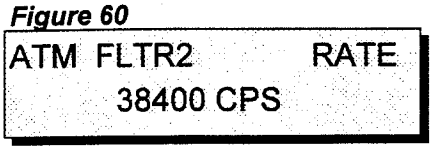


Figure 61

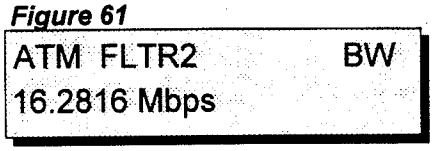
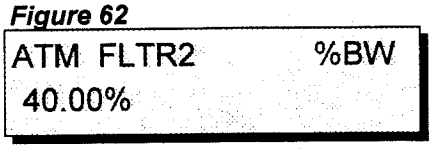


Figure 62



13. Experiment by changing the ATM Transmit Headers and Receive Filters to become more familiar with DS3port operation.

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DS3port Programmable Setup Options

Introduction

The following sections detail each of the available setup options within the DS3port network analyzer. These programmable options allow the DS3port user great flexibility in selecting test methods and in customizing operation to meet all DS3 testing needs.

Remember that the DS3port contains 4 User Configuration groups labeled SET 1, SET 2, SET 3 and SET 4. All of the options presented in the next few pages are available in each SET.

General Setup Options

The General Setup Options address features that determine overall operation of the DS3 tester. The following Setup Options are accessed by pressing SETUP and SETUP a second time. Factory defaults are indicated by a ✓ mark.

1. DEFAULT OP MODE - defines the initial operating mode of the DS3port upon power-up. This default operating mode can be overridden during operation by the user.
   - ✓ ATM CELL XMIT - the DS3port will transmit the ATM cells defined by the ATM Setup parameters.
   - DS3 PAYLD LPBCK - the incoming DS3 payload is re-framed and transmitted.
   - IDLE GENERATION - the outgoing DS3 payload is set to a repeating "1100" pattern.
   - CELL LOOPBACK - all incoming cells with correct Header Checksums, are re-framed and transmitted.
   - DS3 BERT - the DS3port will transmit the default BERT pattern (see BERT Setup Options) within the clear channel DS3 payload.
   - ATM BERT - the DS3port will transmit the selected BERT pattern (see BERT Setup Options) within the virtual channel / path defined in ATM Header 1.
   - PLCP BERT - the DS3port will transmit the default BERT pattern (see BERT Setup Options) within the PLCP payload.

Please Note: *PLCP and ATM monitoring cannot be performed when the DS3port is in DS3 PAYLD LPBCK.*

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Please Note: *If the Internal Clock is used to time the transmitted cell stream occasional unassigned cells will be transmitted due to mismatches between the timing of the recovered cells and the transmitted cells. Using the Recovered Clock option (in the DS3 Setup Parameters) will stop this from occurring.*

2. LOS ACTION - specifies whether the error counters are to be maintained during a loss of signal.
   - ✓ MAINTAIN COUNTERS - the counters will begin where they left off after a signal interruption
   - RESTART CNTRS - the counter will begin at zero (0) whenever signal is interrupted
3. DATE - set to current date
4. TIME - set to current time
5. MONITOR ENTRY - specifies whether the error counters are to be maintained when switching between displays.
   - ✓ MAINTAIN COUNTERS - the counters are to be maintained and returned to every time a monitor mode is entered.
   - RESTART CNTRS - the error counters will begin at zero (0) whenever a new monitor mode is switched to.
6. ALARM BUZZER - the DS3port "beeps" whenever a non-functioning key is pressed.
   - ✓ ON
   - OFF
7. TEST LABEL - an alpha-numeric label that is stored with each saved test result. This label auto-increments after each test.
   - ✓ A001
8. PRINTER MODE - defines when the serial port of the DS3port is activated. NOTE: "prints" also means "downloads" if the DS3port is connected to a computer instead of a printer.
   - ✓ USER ACTIVATED - the DS3port prints only when the user request a printout with the PRINT key.
   - ALARM/EVENT - Not Implemented
   - THRESHOLD - Not Implemented
9. PRINTER OUTPUT - defines the content of the information sent to the DS3port's serial port. NOTE: "prints" also means "downloads" if the DS3port is connected to a computer instead of a printer.
   - ✓ ERRORS & ALARMS - Not Implemented
   - ERRORS ONLY - Not Implemented
   - ALARMS ONLY - Not Implemented

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10. BAUD RATE - specifies the BAUD rate of the serial port.
    - ✓ 9600
    - 2400
    - 1200
11. RESTORE FACTORY SETTINGS - used to reset the DS3port so that all setup options within the current SETUP Group are set as they were when shipped from the factory. When this screen is displayed simply press ENTER and an asterisk * will appear when the DS3port has been reset.

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Setup Options - DS3

The following Setup Options are accessed by pressing SETUP and then DS3. Factory defaults are indicated by a ✓ mark.

1. DS3 XMT LN BLDO - adds a Line Build-out to the transmitter output.
   - ✓ ON
   - • OFF
2. TRANSMIT TIMING - determines the clock source of the transmitted DS3 signal.
   - ✓ INTERNAL - uses the onboard 44.736 Mhz clock.
   - • LOOP RECOVERED - uses the clock recovered from the received DS3 signal.
3. DS3 FRAME FRMAT - determines the DS3 framing format used.
   - ✓ C-BIT FRAMING - forces the DS3port to use the C-BIT framing format for transmission and reception.
   - • M13 FRAMING - forces the DS3port to use the M13 framing format for transmission and reception.

Please Note: *If the framing format changes within a test errors will be indicated and the CBIT LED will blink. Using the AIC to identify framing does not always work because this bit is not guaranteed to be set correctly.*

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Setup Options - Alarms

The following Setup Options are accessed by pressing SETUP and then ALARM. Factory defaults are indicated by a ✓ mark.

1. THRESHOLD ERROR - the number of errors that must be seen in a one second interval for the Threshold Error counter to increment.
   - ✓ 30 - user editable with the EDIT key
2. BLUE AIS DETECT - determines the Alarm Indication Signal (or BLUE alarm) detection algorithm used by the DS3port.
   - ✓ TYPE 1 1010 - Declares AIS whenever the DS3 payload contains an alternating one-zero pattern. Based on AT&T specifications.
   - TYPE 2 1010 C=0 - Declares AIS whenever the DS3 payload contains an alternating one-zero pattern AND all C Bits are set to zero. Based on BellCore specifications.
3. DS3 OUT OF FRME - determines the Out Of Frame criteria used by the DS3port.
   - ✓ NORMAL (3/16) - Out of Frame if 3 frames out of a consecutive 16 contain framing bit errors.
   - LOOSE (3/8) - Out of Frame if 3 frames out of a consecutive 8 contain framing bit errors.

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Setup Options - FEAC

The following Setup Options are accessed by pressing SETUP and then FEAC. Factory defaults are indicated by a ✓ mark.

1. FEAC LPBK REQ - determines whether the DS3port will respond to an FEAC DS3 Loopback Request code.
   - ✓ NO RESPONSE
   - • LPBACK ON REQST - Not Implemented
2. FEAC VALIDATION - determines the number of FEAC codes required to declare detection and the number of misses to remove a FEAC alarm.
   - ✓ ON 8 OFF 2/10 - the DS3port will detect a FEAC alarm that is present for 8 complete pattern repetitions and will remove an alarm that whose code is not present for 2 of 10 repetitions.
   - • ON 4 OFF 1/5 - the DS3port will detect a FEAC alarm that is present for 4 complete pattern repetitions and will remove an alarm that whose code is not present for 1 of 5 repetitions.

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Setup Options - BERT

The following Setup Options are accessed by pressing SETUP and then BERT. Factory defaults are indicated by a ✓ mark.

1. BERT TEST PATRN - defines the pattern used when BERT testing.
   - ✓ 11111111 - same as the AIS signal
   - 10101010 - same as the AIS signal
   - 11001100 - same as the IDLE signal
   - 00000000 - low ones density
   - PTRN (2*15)-1 - PRSB pseudo random pattern
   - PTRN (2*20)-1 - PRSB pseudo random pattern
   - PTRN (2*23)-1 - PRSB pseudo random pattern
   - EDIT-> 00000000 - user editable pattern using the EDIT key
2. BERT: INJCT ERR - configures the DS3port to insert BERT errors within the outgoing BERT pattern.
   - ✓ NO ERRORS - no errors are transmitted
   - 1.0E-3 - inserts roughly 1 Bit Pattern Error every thousand bits to generate a BERT error rate approximately equal to 1.0E-3.
   - 1.0E-6 - inserts roughly 1 Bit Pattern Error every million bits to generate a BERT error rate approximately equal to 1.0E-6.

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Setup Options - PLCP

The following Setup Options are accessed by pressing SETUP and then PLCP. Factory defaults are indicated by a ✓ mark.

1. PLCP ALARM/ERRS - allows the user to selectively disable the DS3port PLCP layer functions.
   - ✓ ENABLE - all DS3port PLCP errors and alarms are monitored
   - DISABLE - all DS3port PLCP errors and alarms are ignored

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Setup Options - ATM

The following Setup Options are accessed by pressing SETUP and then ATM. Factory defaults are indicated by a ✓ mark.

1. CELL XMIT HDR 1 - User editable header used when transmitting ATM cells. HDR 1 is used when continuously transmitting ONE specific cell. HDR's 1 through 4 are cycled through on a two second basis and allocated bandwidth as determined by the Bandwidth parameter. ⇦⇨ combinations are used to access the different header entry displays for each header value HDR1-HDR4. ⇧⇩ select HDR1 - HDR4.

   ✓ VP 000 VC 00000 - a decimal representation of the Virtual Path Indicator and Virtual Channel Indicator fields to be used in the header. Pressing EDIT allows the user to change these values using ⇦⇨⇧⇩ combinations. Pressing ENTER saves the change. Virtual Path Indicator Range 0-256, Virtual Channel Indicator Range 0-65535.

   ✓ PYLDTYP 0 CLP 0 - a decimal representation of the Payload Type field in the ATM header (values 0-7) and a representation of the Cell Loss Priority Bit (0-1).

   ✓ HEC:ON/OK 100% - determines whether Header Checksums are automatically placed in the fifth byte of the ATM header and determines if they are correct or incorrect. The Percentage value is used to allocate bandwidth to this header during Round-Robin or Burst transmission. Using EDIT and ⇦⇨⇧⇩ keys these values can be changed and then saved with the ENTER key. The bandwidth percentage defaults to 100% but can be changed by the user using EDIT. The following Header Checksum options can be selected.

      - HEC:ON/OK - automatically generate correct Header Checksums
      - HEC:ON/BAD - automatically generate incorrect Header Checksums
      - HEC:OFF - allows the user to enter Byte 5 directly using the HEX header entry below.

   ✓ FF (PAYLOAD) - the DS3port uses this hexadecimal value to fill the remaining 48 bytes of each cell generated with the current Header.

   • SPECIAL CASE - For Transmit Header #1 a special payload option, BERT (PAYLOAD), can be selected by pressing EDIT and then the BERT key, instead of editing the hex payload byte. This allows the DS3port to perform ATM payload BERT at the transmission percentages set in round-robin. This feature is only available on Header #1.

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- ✓ 00 00 00 00 55 - the actual byte representation of the transmit header, adjusted whenever the above options are changed. This direct byte entry can be EDITed by the user also.

Please Note: *The VPI and VCI fields are stored modulo 256 and 65535 respectively - higher numbers can be entered while editing but will be truncated.*

Please Note: *If you have HEC generation ON then byte five will be overwritten with the automatically generated header.*

2. CELL XMIT HDR 2 - see HDR 1
3. CELL XMIT HDR 3 - see HDR 1
4. CELL XMIT HDR 4 - see HDR 1
5. RCVE FILTER 1- contains one of four (4) possible receive filter used by the DS3port to compare with incoming ATM cell headers. Editing is accomplished similar to the transmit Headers above.
   - ✓ VP 000 VC 00000 - Virtual Path and Channel Indicator Filters
   - ✓ PYLDTYP X CLP X - Payload Type and Cell Loss Priority Filters
   - ✓ 00 00 00 00 55 - Raw Header Comparison Data. Only the first 4 bytes are used by the filter the HEC byte, byte 5, is not used when comparing to the incoming ATM cell stream but is calculated internally by the DS3port.

Please Note: *One difference exists in that a field can be changed to "DON'T CARE" which is represented by "X". An "X " in any position of a field will cause that whole field, VCI, VPI, etc., to be ignored.) The DS3port will not compare these fields with the same fields contained in the incoming headers.*

Please Note: *Only one of the four possible receive filters can be active at any one time although all four can be entered so that a user may switch rapidly between them when monitoring cells.*

6. RCVE FILTER 2 - See RCVE FILTER 1
7. RCVE FILTER 3 - See RCVE FILTER 1
8. RCVE FILTER 4 - See RCVE FILTER 1
9. CELL GENERATION - determines the method used by the DS3port to generate ATM cells.
   - ✓ HDR 1: CONSTANT - continuous transmission of ATM cells using the header defined in HDR 1. These cells are generated at 96,000 cells per second.
   - HDR 2: CONSTANT - continuous transmission of ATM cells using the header defined in HDR 2. These cells are generated at 96,000 cells per second.
   - HDR 3: CONSTANT - continuous transmission of ATM cells using the header defined in HDR 3. These cells are generated at 96,000 cells per second.
   - HDR 4: CONSTANT - continuous transmission of ATM cells using the header defined in HDR 4. These cells are generated at 96,000 cells per second.

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- ROUND ROBIN - cyclic ATM cell transmission providing for the transmission ATM cells using headers HDR 1 through HDR 4 defined above. The DS3port allocates instantaneous bandwidth to each header as selected and completes one four header cycle every 2 seconds.
- BURST - Unassigned cells are transmitted until the user generates a BURST. A BURST is sent by pressing TEST ATM to enter ATM transmit mode and then pressing the START/STOP key each time a burst is desired. For each press of the START/STOP key a "one-shot" 2 second burst through headers HDR 1 through HDR 4 is generated by the DS3port. After this BURST unassigned cells are then transmitted. The amount of cells burst depends upon the percentage bandwidth allocated to each particular Header. If Header 1 was set to 5% BW allocation a burst of exactly 9600 cells with Header 1 settings would occur. Setting a Header to 100% allocation would result in exactly 192,000 cells being sent. This is equivalent to 96,000 Cells/Second over 2 seconds.

10. PAYLD SCRAMBLING - controls the automatic scrambling of ATM cell payloads (used to guarantee a higher ones density and no alarm false triggering). Uses the self synchronizing polynomial $X^{43} + 1$ to scramble the transmitted cell payloads and de-scramble the received payloads.

✓ OFF

- ON

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Setup Options - Automatic Testing

The following Setup Options are accessed by pressing SETUP and then AUTO. Factory defaults are indicated by a ✓ mark.

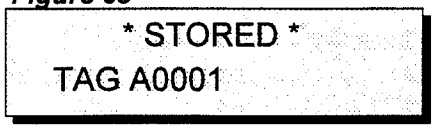
1. VPI RANGE - allows the user to setup upper and lower Virtual Path Indicator boundaries used during bounded ATM activity scans.
   - ✓ 000 MIN - Editable lower VPI boundary
   - 255 MAX - editable upper VPI boundary, cannot exceed 255.
2. VCI RANGE - allows the user to setup upper and lower Virtual Circuit Indicator boundaries used during bounded ATM activity scans.
   - ✓ 00000 MIN - Editable lower VPI boundary
   - 65535 MAX - editable upper VPI boundary, cannot exceed 65535.
3. SCAN TIME - the amount of time spent looking for activity with a single VPI, VCI header mask at intermediate points during an ATM activity scan when "U"ser is selected as the scan speed.
   - ✓ 2.0 Seconds - editable in 1/10 of a second intervals up to 9.9 seconds.

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Test Storage and Retrieval

The DS3port stores test results tagged with the date and time whenever the MEMORY key is pressed while viewing the results. When this key is pressed the display briefly flashes the message as shown in Figure 63. This indicates that the results being viewed have been stored as TAG A0001.

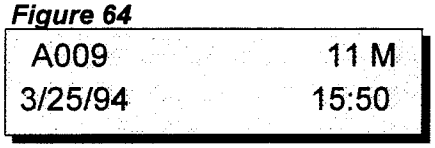
Figure 63



In addition to storing the currently viewed results the power level in signal units and the date and time are stored.

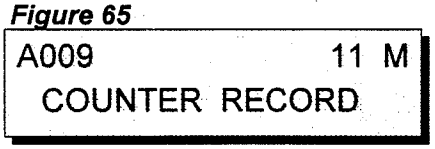
To retrieve the results, from the Top Level menu press Memory. The "Bounding Bubble" changes to a flashing 'M' to indicate that you are in Memory Retrieval mode.

Figure 64



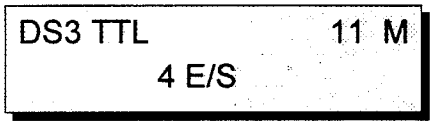
A display similar to Figure 64 will result. This display indicates the test tag (A009) in the upper left corner, the total number of stored records (11) in the right upper corner, and the date and time that this particular record was stored on the bottom line of the display.

Figure 65



The ⇦⇨ arrows can be used to cycle the bottom display through the record type (COUNTER RECORD) and Signal UNIT value (SIGNAL 1148 UNIT). To display the actual stored results press ENTER when record type (COUNTER RECORD) is visible. See Figure 65.

Figure 66



You will then be presented with the names and display formats of the various information that is stored. The ⇦⇨⇧⇩ arrows will work just as if you were viewing the results live. See Figure 66.

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Printing and Download

The DS3port can output its Configuration Parameters and Test Results to a printer or personal computer connected to its RS-232 Serial Port. A communications terminal program (such as Procomm, Crosstalk, or the Windows Terminal program) is required to capture serial download to a PC.

Connecting to a Serial Printer or Personal Computer Serial Port

The DS3port supports serial data connections 1200, 2400, and 9600 Baud. It also supports XON/XOFF and CTS/RTS handshaking. Please insure that your printer or terminal software is configured to correctly match the DS3port settings. When connecting to a serial printer or PC the supplied RJ-11 to 25 Pin converter allows connections to standard 25 pin male serial ports. Other configurations may require 9 pin to 25 pin converters, gender changers, or null modem adapters. To assist you in establishing a working connection Table VI describes the serial control signals available at DeskNets 25 pin female connector.

Table VI

Serial Port 25 Pin Connection Pin Descriptions									
Pin	Description	Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	No Connection	2	DS3port RXD - Receive Data	3	DS3port TXD - Transmit Data	4	CTS - Clear To Send	5	RTS - Ready To Send
6	RTS - Ready To Send	7	SIG GND - Signal Ground	8-25	No Connections				

Configuration Print/Download Operation

Figure 67

```
SELECT PRINT
CONFIG PARAMS
```

To Print or Download configuration information press the PRINT key from the top level menu. A display similar to Figure 67 will result. Then press ENTER to begin the Print/Download Process.

CONFIG PARAMS - lists the value of each user setup option within the DS3port. See the Sample Printouts at the end of this section.

Print/Download of Other Test Results

Printouts or Download of other test results are obtained when you are viewing the actual results by pressing the PRINT key on the DS3port keypad. The print key is active anytime you are viewing the following items:

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- MONITOR DS3 Results
- MONITOR ATM Results
- MONITOR FEAC
- ALARM LIST

See the Sample Printouts at the end of this section.

DS3port Sample Printouts

Configuration Parameters Sample Printout

DS3port Copyright (c) 1993 DeskNet Systems Inc.
Parameter Values 4/20/09 Mon 4:40 PM
Active Configuration Set: 1
Parameter Set 1
XMIT HEADER 1: 06400000A7, Payload FF, VPI 100, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 25%
XMIT HEADER 2: 00100000F7, Payload FF, VPI 1, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 75%
XMIT HEADER 3: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 4: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
Receive Filter 1: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 2: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 3: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 4: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
BERT pattern: 11111111
Threshold Error: 30
Default Operating Mode: ATM CELL XMIT
Buzzer: ON
Printer Mode: USER ACTIVATED
Printer Output: ERRORS & ALARMS
Baud Rate: 9600
Transmit Timing: INTERNAL
DS3 Ttransmit Frame Format: C-BIT FRAMING
Scrambling: OFF
Transmit Header Generation:
BERT Error Injection Rate: NO ERRORS
FEAC Loopback Request Action: NO RESPONSE
Blue AIS Detect Criteria: TYPE 1 1010
DS3 Out of Frame Criteria: NORMAL (3/16)

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Test Duration: CONTINUOUS
Test Period 00D 00H 00M Per=0
Test Label: A001

Parameter Set 2
XMIT HEADER 1: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 100%
XMIT HEADER 2: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 3: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 4: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
Receive Filter 1: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 2: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 3: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 4: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
BERT pattern: 11111111
Threshold Error: 30
Default Operating Mode: ATM CELL XMIT
Buzzer: ON
Printer Mode: USER ACTIVATED
Printer Output: ERRORS & ALARMS
Baud Rate: 9600
Transmit Timing: INTERNAL
DS3 Ttransmit Frame Format: C-BIT FRAMING
Scrambling: OFF
Transmit Header Generation: HDR 1: CONSTANT
BERT Error Injection Rate: NO ERRORS
FEAC Loopback Request Action: NO RESPONSE
Blue AIS Detect Criteria: TYPE 1 1010
DS3 Out of Frame Criteria: NORMAL (3/16)
Test Duration: CONTINUOUS
Test Period 00D 00H 00M Per=0
Test Label: A001

Parameter Set 3
XMIT HEADER 1: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 100%
XMIT HEADER 2: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 3: 0000000055, Payload FF, VPI 0, VCI 0

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Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 4: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
Receive Filter 1: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 2: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 3: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 4: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
BERT pattern: 11111111
Threshold Error: 30
Default Operating Mode: ATM CELL XMIT
Buzzer: ON
Printer Mode: USER ACTIVATED
Printer Output: ERRORS & ALARMS
Baud Rate: 9600
Transmit Timing: INTERNAL
DS3 Ttransmit Frame Format: C-BIT FRAMING
Scrambling: OFF
Transmit Header Generation: HDR 1: CONSTANT
BERT Error Injection Rate: NO ERRORS
FEAC Loopback Request Action: NO RESPONSE
Blue AIS Detect Criteria: TYPE 1 1010
DS3 Out of Frame Criteria: NORMAL (3/16)
Test Duration: CONTINUOUS
Test Period 00D 00H 00M Per=0
Test Label: A001

Parameter Set 4
XMIT HEADER 1: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 100%
XMIT HEADER 2: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 3: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
XMIT HEADER 4: 0000000055, Payload FF, VPI 0, VCI 0
Checksum Calculation: ON/OK , CLP 0, Payload Type 0, BW 0%
Receive Filter 1: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 2: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 3: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
Receive Filter 4: 0000000055, GFC 0, VPI 0, VCI 0, CLP 0, Payload Type 0,
BERT pattern: 11111111
Threshold Error: 30
Default Operating Mode: ATM CELL XMIT

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Buzzer: ON
Printer Mode: USER ACTIVATED
Printer Output: ERRORS & ALARMS
Baud Rate: 9600
Transmit Timing: INTERNAL
DS3 Ttransmit Frame Format: C-BIT FRAMING
Scrambling: OFF
Transmit Header Generation: HDR 1: CONSTANT
BERT Error Injection Rate: NO ERRORS
FEAC Loopback Request Action: NO RESPONSE
Blue AIS Detect Criteria: TYPE 1 1010
DS3 Out of Frame Criteria: NORMAL (3/16)
Test Duration:
Test Period 00D 00H 00M Per=0
Test Label: A001

ALARM STATUS Sample Printout

Alarms (32)
01/32 OOF Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
02/32 AIC Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
03/32 POOF Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
04/32 PLOF Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
05/32 FEI Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
06/32 BIP8 Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
07/32 COFA Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
08/32 AIC Duration: 00:00 Start: 19:19:17 4/21 End: 19:19:17 4/21
09/32 FERF Duration: 00:01 Start: 19:19:23 4/21 End: 19:19:24 4/21
10/32 POOF Duration: 00:02 Start: 19:19:28 4/21 End: 19:19:30 4/21
11/32 FEI Duration: 00:00 Start: 19:19:28 4/21 End: 19:19:28 4/21
12/32 BIP8 Duration: 00:00 Start: 19:19:28 4/21 End: 19:19:28 4/21
13/32 PLST Duration: 00:00 Start: 19:19:28 4/21 End: 19:19:28 4/21
14/32 PLOF Duration: 00:02 Start: 19:19:28 4/21 End: 19:19:30 4/21
15/32 FEI Duration: 00:00 Start: 19:19:28 4/21 End: 19:19:28 4/21
16/32 BIP8 Duration: 00:00 Start: 19:19:28 4/21 End: 19:19:28 4/21
17/32 AIS Duration: 00:02 Start: 19:19:28 4/21 End: 19:19:30 4/21
18/32 PLST Duration: 00:00 Start: 19:19:30 4/21 End: 19:19:30 4/21
19/32 POOF Duration: 00:02 Start: 19:19:32 4/21 End: 19:19:34 4/21
20/32 FEI Duration: 00:00 Start: 19:19:32 4/21 End: 19:19:32 4/21
21/32 BIP8 Duration: 00:00 Start: 19:19:32 4/21 End: 19:19:32 4/21
22/32 PLST Duration: 00:00 Start: 19:19:32 4/21 End: 19:19:32 4/21
23/32 PLOF Duration: 00:02 Start: 19:19:32 4/21 End: 19:19:34 4/21
24/32 FEI Duration: 00:00 Start: 19:19:32 4/21 End: 19:19:32 4/21

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25/32 BIP8 Duration: 00:00 Start: 19:19:32 4/21 End: 19:19:32 4/21
26/32 IDLE Duration: 00:02 Start: 19:19:32 4/21 End: 19:19:34 4/21
27/32 PLST Duration: 00:00 Start: 19:19:34 4/21 End: 19:19:34 4/21
28/32 OOF Duration: 00:01 Start: 19:19:45 4/21 End: 19:19:46 4/21
29/32 OOF Duration: 00:00 Start: 19:19:47 4/21 End: 19:19:47 4/21
30/32 YEL Duration: 00:01 Start: 19:19:58 4/21 End: 19:19:59 4/21
31/32 POOF Duration: --:-- Start: 19:20:02 4/21 Active
32/32 FEI Duration: 00:00 Start: 19:20:02 4/21 End: 19:20:02 4/21

DS3 Counters Sample Printout

DS3 Counters
BPV Count 131070
EIB Count 131070
F-BIT Count 12276
P-BIT Count 1332
C-BIT Count 1278
FEBE Count 15954
DS3 TTL Count 292980
BPV Rate/Second 0
EIB Rate/Second 0
F-BIT Rate/Second 0
P-BIT Rate/Second 0
C-BIT Rate/Second 0
FEBE Rate/Second 0
DS3 TTL Rate/Second 0
BPV Average 1.25E-05
EIB Average 1.06E-03
F-BIT Average 1.99E-04
P-BIT Average 1.27E-07
C-BIT Average 1.22E-07
FEBE Average 1.52E-06
DS3 TTL Average 2.80E-05
BPV Errored Seconds 1
EIB Errored Seconds 1
F-BIT Errored Seconds 5
P-BIT Errored Seconds 1
C-BIT Errored Seconds 1
FEBE Errored Seconds 7
DS3 TTL Errored Seconds 16
BPV Threshold Errored Seconds 1
EIB Threshold Errored Seconds 1
F-BIT Threshold Errored Seconds 5

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P-BIT Threshold Errored Seconds 1
C-BIT Threshold Errored Seconds 1
FEBE Threshold Errored Seconds 5
DS3 TTL Threshold Errored Seconds 14

ATM Counters Sample Printout

ATM Counters
ATM HCERR Count 286
ATM FLTR Count 22754993
ATM OTHER Count 0
ATM TTL Count 22755279
ATM HCERR Cells per Second 0
ATM FLTR Cells per Second 96000
ATM OTHER Cells per Second 0
ATM TTL Cells per Second 96000
ATM HCERR Bandwidth 0.0000
ATM FLTR Bandwidth 40.7040
ATM OTHER Bandwidth 0.0000
ATM TTL Bandwidh 40.7040
ATM HCERR Percent Bandwidth 0.00
ATM FLTR Percent Bandwidth 100.00
ATM OTHER Percent Bandwidth 0.00
ATM TTL Percent Bandwidth 100.00

FEAC Monitor Sample Printout

FEACs (7)
01/07 EQ FAIL SA Duration: 00:00 Start: 19:17:58 4/21 End: 19:17:58 4/21
02/07 OOF Duration: 00:00 Start: 19:18:00 4/21 End: 19:18:00 4/21
03/07 AIS RCVD Duration: 00:00 Start: 19:18:01 4/21 End: 19:18:01 4/21
04/07 D DS3 LINE Duration: 00:00 Start: 19:18:05 4/21 End: 19:18:05 4/21
05/07 IDLE RCVD Duration: 00:04 Start: 19:18:12 4/21 End: 19:18:16 4/21
06/07 EQ FAIL NS Duration: 00:00 Start: 19:18:18 4/21 End: 19:18:18 4/21
07/07 EQ FAIL NS Duration: 00:00 Start: 19:18:19 4/21 End: 19:18:19 4/21

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