



**ADTRAN**<sup>®</sup>

## Quad Fiber Remote (QDFR) Unit Installation and Maintenance Practice

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## Revision History

Revision	Date	Description of Changes
A	July 2005	Initial release
B	December 2004	Added front panel LED information in Table 2.
C	April 2005	Added QDFR Provisioning menu defaults in Table 3.
D	June 2006	Changed connector designation from RJ-45 to RJ-48C. Changed Transmit Level values to Output Optical Power values in Table 5. Updated document format.
E	July 2006	Updated CLEI.

## Conventions

The following typographical conventions are used in this document:

**This font** indicates a cross-reference link. First-time references to tables and figures are shown in **this font**.

**This font** indicates screen menus, fields, and parameters.

**THIS FONT** indicates keyboard keys (ENTER, ESC, ALT). Keys that are to be pressed simultaneously are shown with a plus sign (ALT+X indicates that the ALT key and X key should be pressed at the same time).

*This font* indicates references to other documentation and is also used for emphasis.

**This font** indicates on-screen messages and prompts.

**This font** indicates text to be typed exactly as shown.

**This font** indicates silkscreen labels or other system label items.

**This font** is used for strong emphasis.

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### NOTE

Notes inform the user of additional, but essential, information or features.

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### CAUTION

Cautions inform the user of potential damage, malfunction, or disruption to equipment, software, or environment.

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### WARNING

Warnings inform the user of potential bodily pain, injury, or death.

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## Training

ADTRAN offers training courses on our products. These courses include overviews on product features and functions while covering applications of ADTRAN product lines. ADTRAN provides a variety of training options, including customized training and courses taught at our facilities or at customer sites.

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# Quad Fiber Remote Unit

## GENERAL

This practice is an installation and maintenance guide for the ADTRAN Quad Fiber Remote (QDFR) unit. The QDFR (P/N 1181307L7) front panel is illustrated in [Figure 1](#). The QDFR rear panel is illustrated in [Figure 2](#).



Figure 1. QDFR Front Panel

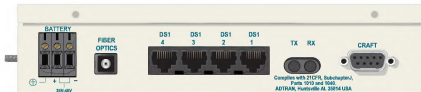


Figure 2. QDFR Rear Panel

## Description

The QDFR is a customer premise fiber optic access unit. The QDFR is designed to provide four T1 interfaces that can be multiplexed together over a single mode fiber optic cable to a Total Access 3000 Quad Fiber Central Office (QDFC) Module (P/N 1181308L7).

The QDFR is specifically designed to provide a high degree of resistance to damage typically caused by Ground Potential Rises (GPRs). This is accomplished by having the network interface optically isolated from the customer side and the DS-1 interfaces having over 6 kilovolts of isolation with respect to ground. The QDFR is virtually immune to the effects of GPRs compared to other network interface equipment.

## Features

The QDFR provides the following features:

- Software provisionable via menu access (no onboard switches)
- Front panel indicators for the following:
  - Optical port status
  - T1 status for all channels
  - Loopback status
  - Test port operation
- Operation over extended temperature range of  $-40^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$
- Optical interface consisting of a single mode transceiver module comprised of a single fiber transmitter and an SC receptacle
- Optical interface port support for flat SC-type optical connectors
- Single fiber optical interface
- Operating wavelengths:
  - 1310 nm for the receiver
  - 1550 nm for the transmitter

## Compliance

The QDFR is NRTL listed to UL 60950. The QDFR is compliant to IEC-60825 Class 1 and is also compliant with 21CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001. The QDFR is intended for use in restricted access locations only.

Table 1 provides compliance codes for the QDFR.

**Table 1. Compliance Codes**

Code	Input	Output
Power Code (PC)	F	C
Telecommunication Code (TC)	-	-
Installation Code (IC)	A	-

The DS1 interfaces for the QDFR are to be connected to intra-building wiring only.

### CAUTION

Per GR-1089-CORE October 2002, Section 9, this system is designed and intended only for installation in a DC-C (common) Bonding and Grounding system. It is not intended or designed for installation in a DC-I (isolated) Bonding and Grounding system.

## INSTALLATION



After unpacking the QDFR, inspect it for damage. If damage has occurred, file a claim with the carrier then contact ADTRAN Customer Service. Refer to “[Appendix C, Warranty](#)” for further information. If possible, keep the original shipping container for returning the QDFR for repair or for verification of shipping damage.

## SHIPPING CONTENTS

The contents include the following items:

- QDFR Unit
- *Quad Fiber Remote (QDFR) Unit Job Aid* (P/N 61181307L7-22)

---

### CAUTION

Electronic modules can be damaged by ESD. When handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.

---

## Installing the QDFR

To install the QDFR, perform the following steps:

1. Place the unit in a location where a DC power source is available. This unit operates within a voltage range of -24 VDC to -48 VDC.
2. Using the hex nut and lock washer supplied with the QDFR, attach a grounding strap to the grounding lug on the left side of the QDFR chassis. Finger-tighten only.
3. Connet power to the QDFR by connecting the plus (+), minus (-), and ground wires to a three-position terminal block located at the left of the backplane ([Figure 2](#)). The DS1 loop connections are made through four RJ-48C type connectors. Single-mode fiber is connected to the SC-type connector located at the right of the backplane.

When the QDFR first powers up, the unit initializes a self test that lasts for approximately 30 seconds. After the self test is completed, the LEDs reflect the current status of the unit.

## Front Panel LEDs

The QDFR provides front panel LEDs to display status information for the unit. [Table 2](#) lists the front panel LEDs and their indications.

**Table 2. Front Panel LEDs**

Label	Indications	Description
OPT	● Green	Signal present
	● Red	Loss of signal
	●/● Flashing (Red/Green)	Errored second
DS1 (1-4)	○ Off	Port Service state set to Out of Service: Unassigned
	● Green	Good signal present
	● Yellow	Near-end or Far-end loopback present
	● Red	Loss of signal
	●/● Flashing (Red/Green)	Errored second
	○ Flashing	Port selected for loopback switches and test access, flashing state times out 1 minute after channel selection is made
LBK NEND/FEND	○ Off	No loopback present on selected channel
	● Green	Far-end loopback present on selected channel
	● Yellow	Near-end loopback present on selected channel
TERM/MON	● Green	Test jack in Monitor mode on selected channel
	● Red	Test jack enabled for Terminate mode (intrusive access) on selected channel

## Front Panel Pushbuttons

The QDFR has two pushbuttons located on the front panel:

- Channel Select (**CH SELECT**)
- Loopback (**LBK**)

To initiate a channel loopback at the QDFR, press **CH SELECT** until the desired channel LED is flashing, then press **LBK** to initiate the loopback.

---

### NOTE

This selection only pertains to the test jack and the pushbuttons. The user may continue to initiate or terminate any loopback on any channel via the craft port.

---

- To initiate a loopback at the QDFC, press the **LBK** pushbutton for at least 3 seconds.
- To terminate active loopback(s), press the **LBK** switch while any loopback is active.

---

### NOTE

All loopbacks initiated by the QDFR pushbuttons are bilateral. Data from the port input is sent to the port output, and data from the network (fiber) is sent back to the fiber.

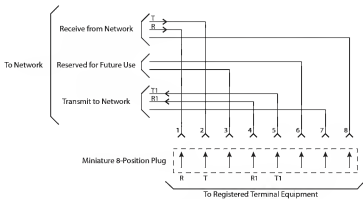
---

## LOOP CONNECTIONS

The T1 loop connections are made through four RJ-48C type connectors. For each connector, transmit tip and ring are on pins 5 and 4, and receive tip and ring are on pins 2 and 1, respectively. The single-mode fiber is connected to the SC connector located on the back panel of the unit.

## OPERATION

The Quad Fiber Remote (QDFR) Unit provides a platform to exchange data between four T1s and an optical fiber interface. The customer data connection is via the RJ-48C connectors on the unit. An optical fiber interface is provided for communication with the loop. The Quad Fiber Remote (QDFR) Unit operates with a QDFC module at the other end of the fiber optic cable. The figure below illustrates the pin-out configuration for the RJ-48C connectors.



**Figure 3. RJ-48C Pinout Configuration**

## Power Interface

The power for the QDFR can be supplied through a -48 VDC supply connected to the back of the QDFR. The QDFR can be powered from -24 VDC to -48 VDC.

## Diagnostics

There are several options available for diagnostics:

- Front panel LEDs (see [Table 2](#) on page 4)
- "Loopback and Test Commands Menu" on page 12
- "Performance History Menu" on page 16
- "Troubleshooting Menu" on page 22

## PROVISIONING

The QDFR provides the ability to change provisioning options. [Table 3](#) lists the valid settings and defaults for the provisioning options. Provisioning options are set independently for each of the DS1s.

**Table 3. QDFR Provisioning Menu Defaults**

Option	Settings (Default in <b>BOLD</b> )
<b>Provisioning – Channel Options</b>	
DSX-1 Line Buildout	<b>0-133 Feet</b>
	133-266 Feet
	266-399 Feet
	399-533 Feet
	533-655 Feet
DSX-1/DS1 Line Code	AMI;
	<b>B8ZS</b>
NIU Loopback	Disabled
	<b>Enabled</b>
Loopback Timeout	None
	<b>120 Min</b>
DS1 TX Level	<b>0 dB</b>
	-7.5 dB
	-15 dB
Customer Loss Indicator	<b>AIS</b>
	Loopback

## MENU STRUCTURE

The menu structure for the QDFR is a layered menu tree. Each layer of the menu tree is displayed as a menu or a screen.

### Menu

A menu is a display that provides numbered selections that are used to navigate to related menus, modify provisioning information, or display information screens. A menu can contain the following objects:

- **Menu Option:** A menu option is indicated by a number, which when selected navigates the display to another menu layer or is used to change the option setting.
- **Read-only Field:** A read-only field displays information that cannot be changed. The information displayed in a read-only field can be static or can be automatically updated by the QDFR.
- **Read-write Field:** A read-write field displays information that when selected can be modified.
- **Hot Key:** A hot key is a key or combination of keys that are assigned to a function. Hot keys are indicated by the required key(s) and a brief description (i.e., N - Next Channel).

### Screen

A screen is a display that usually indicates the end of a menu tree path. A screen can contain the following objects:

- **Read-only Field:** A read-only field displays information that cannot be changed. The information displayed in a read-only field can be static or can be automatically updated by the QDFR.
- **Read-write Field:** A read-write field displays information that when selected can be modified.
- **Hot Key:** A hot key is a key or combination of keys that are assigned to a function. Hot keys are indicated by the required key(s) and a brief description (i.e., N - Next Channel).

## MENU NAVIGATION

Basic menu navigation is accomplished by selecting the desired option number and then pressing ENTER. To return to the previous menu, press the Esc (escape) key.

## MENU DESCRIPTIONS

The QDFR Main Menu (Figure 4) is the access point to all other operations. The Main Menu options have several functions and submenus that identify and provide access to specific operations and parameters.

shelf: 1 Slot: 2	Total Access System	mm/dd/yy hh:mm
Unacknowledged Alarms:	ADTRAN QDF Main Menu	
	1. QDF Unit Information	
	2. Provisioning	
	3. Status	
	4. Auto In Service	
	5. Loopbacks and Test	
	6. Performance History	
	7. Scratch Pad, Ckt ID	
	8. Alarm History	
	9. Event History	
	10. Troubleshooting	
	11. Clear PM and Alarm Histories	
	12. System PM/Screen Report	
	13. Flash Upgrade	
	14. Virtual Terminal Control	
	Selection:	

**Figure 4. ADTRAN QDF Main Menu**

The Main Menu options are shown in Table 4.

**Table 4. ADTRAN QDF Main Menu Options**

Option	Description	Function
1	QDF Unit Information	This option displays the "QDF Unit Information Screen" on page 9.
2	Provisioning	This option displays the "Provisioning Menu" on page 10.
3	Status	This option displays the "Status Screen" on page 11.
4	Auto In Service	This option displays the "Auto In Service Screen" on page 11.
5	Loopbacks and Test	This option displays the "Loopback and Test Commands Menu" on page 12.
6	Performance History	This option displays the "Performance History Menu" on page 16.
7	Scratch Pad, Ckt ID	This option displays the "Scratch Pad, Circuit ID Menu" on page 19.



**Table 4. ADTRAN QDF Main Menu Options (Continued)**

Option	Description	Function
8	Alarm History	This option displays the "Alarm History Menu" on page 20.
9	Event History	This option displays the "Event History Screen" on page 21.
10	Troubleshooting	This option displays the "Troubleshooting Menu" on page 22.
11	Clear PM and Alarm Histories	This option displays the "Clear PM and Alarm Histories Option" on page 23.
12	System PM/Screen Report	This option displays the "System PM/Screen Report Menu" on page 24.
13	Flash Upgrade	This option displays the "Download QDFR via Y-Modem Menu" on page 25.
14	Virtual Terminal Control	This option displays the "Virtual Terminal Control" on page 26.

### QDF Unit Information Screen

The QDF Unit Information screen (see [Figure 5](#)) is a read-only display that identifies the QDFC and QDFR. The QDFC and QDFR name, CLEI code, part number, serial number, date of manufacturing, and software revision are included in this screen.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                ADTRAN
                                901 Explorer Boulevard
                                Huntsville, Alabama 35806-2807
----- For Information or Technical Support -----
Support Hours ( Normal 7am - 7pm CST, Emergency 7 days x 24 hours )
Phone: 800.726.8668 / 888.873.HDSL Fax: 256.963.6217 Internet: www.adtran.com
-----

QDFC                               QDFR
P/N: 1181308L7                      P/N: 1181307L7
S/N: L8A0TND426@12345678901234      S/N: L8A0TND426@12345678904321
CLEI: M5LJ0HEAAA                    CLEI: N3M1400BRA
Manf: 12/01/2003                    Manf: 07/01/2005
Ver: A03                             Ver: A03

```

**Figure 5. QDF Unit Information Screen**

## Provisioning Menu

The Provisioning menu (Figure 6) is used to make provisioning changes to various options.

```
Shelf: 1 slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                Provisioning

                                1. Channel Options
                                2. Fiber PM Threshold Options
                                3. T1 PM Threshold Options
                                4. Copy Settings
                                5. Restore Factory defaults

                                Selection:
```

**Figure 6. Provisioning Menu**

The Provisioning menu contains the following submenus related to specific provisioning items:

- Channel Options
- Fiber PM Threshold Option
- T1 PM Threshold Options
- Copying Settings
- Restore Factory Defaults

Refer to [Table 3](#) on page 6 for default channel provisioning options.

## Status Screen

The Status screen (Figure 7) provides information regarding the status of the QDFR.

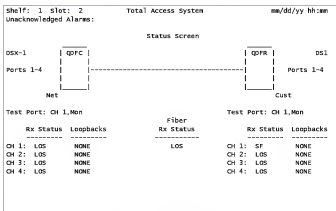


Figure 7. Status Screen

## Auto In Service Screen

The Auto In Service Status screen (Figure 8) displays the status of the equipment and individual channels. The parameters are set through the QDFC, and are not provisionable from the QDFR.

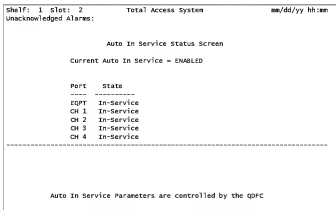


Figure 8. Auto In Service Status Screen

## Loopback and Test Commands Menu

Loopback and Test Commands menu (Figure 9) provides several performance tests for the QDFR.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm

          Loopback and Test Commands

Loopback Status:  QDFC          QDFR
-----
CH1:             NONE          NONE
CH2:             NONE          NONE
CH3:             NONE          NONE
CH4:             NONE          NONE

Test Port:        CH 1,Mon      CH 1,Mon

1. Loopbacks
2. Loopdown All
3. Test Port (Bantam Jack) Control
4. BERT Test Functions
5. Self Tests
Selection:

```

**Figure 9. Loopback and Test Commands Menu**

## Loopback Control Menu

The Channel # Loopback Control menu (Figure 10) is used to perform loopback between the QDFR and QDFC to the Network or Customer.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm

          CH 1 Circuit ID:

          Channel 1 Loopback Control

1. Loopup QDFC to Network
2. Loopup QDFC to Customer
3. Loopup QDFR to Network
4. Loopup QDFR to Customer

'Sx' - select channel x 'N' - Next Channel 'P' - Previous Channel

Selection:

```

**Figure 10. Loopback Control Menu**

### Test Jack Configuration Screen

The Test Jack Configuration screen (Figure 11) controls the test jack, which is found on the back of the QDFR unit. This jack can “look at” a chosen port, in either direction as chosen by the user, as if it were a monitor jack (non-intrusive mode) or it can “break” a chosen port, in either direction, as if it were a equipment jack (intrusive mode).

```

shelf: 1 slot: 2          Total Access System          mm/dd/yy hh:mm

Test Jack Configuration Screen
-----
Test Jack Mode:          Monitor
Active Port Number:     Port 1
Intrusive Test Direction: Network

1. Toggle Test Jack Mode
2. Change Test Port Number
3. Toggle Intrusive Test Direction

Selection:
  
```

**Figure 11. Test Jack Configuration Screen**

The options on this screen are as follows:

- Toggle Test Jack Mode – Select Monitor (non-intrusive) or Terminate (intrusive)
- Change Test Port Number – Select an active port
- Toggle Inclusive Test Direction – This option has no effect on Monitor mode. Select Network or Customer

Refer to “Appendix B”, “Rear Panel DS1 Test Access” for a full description of the functionality of the test jack.

**BERT Test Screen**

The Channel # BERT Test screen (Figure 12) performs a test with the following options:

- (Re)start Pattern – Use this option to (re)start a test.
- Stop Test – Use this option to manually stop a test.
- Select Data Pattern – Use this option to access the Current Pattern menu (Figure 13), which is used to select the appropriate data test pattern for the desired results.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

OH 1 Circuit ID:
Channel 1 BERT Test Screen

-----
Test Results
-----
Test Direction:          T1 Interface
Unframed Pattern Generation: OFF
Pattern:                 QRS5 Pattern
Line Coding:            AMI
Bit Errors:              0000000
Bit Error Rate:         0.0E-0
Pattern Sync:           N/A
Pattern Sync Losses:    000
Test Length (HH:MM:SS): 01:00:00
Time Elapsed (HH:MM:SS): 00:00:00
-----
1. (Re)start Pattern          2. Stop Test
3. Select Data Pattern       4. Enter Test Timeout
5. Toggle Test Direction

'Sx' - Select Channel x 'N' - Next Channel 'P' - Previous Channel
Selection:

```

**Figure 12. BERT Test Screen**

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

NETWORK Pattern Screen

Current Pattern = QRS5 Pattern
-----
1. 63 Pattern
2. 511 Pattern
3. 2047 Pattern
4. REV. 2047 Pattern
5. 2A15 Pattern
6. 2A20 Pattern
7. QRS5 Pattern
8. 2A23 Pattern

Selection:

```

**Figure 13. Network Pattern Screen**

- Enter Test Timeout – This option displays the Network Timeout screen (Figure 14). The timeout can run for a specific duration by entering the hours and/or minutes, or can run indefinitely by entering 00:00.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

      NETWORK Timeout Screen

      Test Timeout(Hr:Min) = 01:00
      -----

      1. Change Timeout

      *NOTE: when timeout is set to 00:00, the
            test will run indefinitely.

      selection:
  
```

**Figure 14. Network Timeout Screen**

- Toggle Test Direction – When a test is not running, this option is used to toggle the test signal in the opposite direction (from customer to network and vice versa). When a test is running, this option changes to Inject Bit Errors (Figure 15). This allows errors to be generated from the test origination point to validate the test results.

```

Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

      CH 1 Circuit ID:
      Channel 1 BERT Test Screen

      Test Results
      -----

      Test Direction:          T1 Interface
      Unframed Pattern Generation: ON
      Pattern:                  63 Pattern
      Line Coding:              B&ZS
      Bit Errors:                0000000
      Bit Error Rate:           0.0E-09
      Pattern Sync:             ACQUIRED
      Pattern Sync Losses:      000
      Test Length (HH:MM:SS):   01:01:00
      Time Elapsed (HH:MM:SS): 00:01:30
      -----

      1. Number of Errors to Inject = 002 (Maximum=255)
      2. Inject Bit Error
      3. (0)e)start

      selection:
  
```

**Figure 15. BERT Inject Errors Screen**

### Self-Tests Screen

Selecting Self-Tests performs tests of the QDFC and QDFR, with no additional user input. If all functions pass, the "Self Test Complete" message appears (Figure 16).

```
Shelf: 1 Slot: 2          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                SELF TEST COMPLETE

                                QDFC : Passed
                                QDFR : Passed
```

Figure 16. Self-Test Complete

### Performance History Menu

The Performance History menu (Figure 17) displays the performance of each individual end of the circuit. A single channel can be viewed by selecting the option number for the channel of choice.

```
Shelf: 1 Slot: 11       Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                Performance History

                                1. Channel 1
                                2. Channel 2
                                3. Channel 3
                                4. Channel 4
                                5. QDFC/QDFR Fiber

                                selection:
```

Figure 17. Performance History Menu



### Performance History Channel # Menu

The Performance History Channel # menu (Figure 18) displays the performance of a specific channel. From this screen, the network or customer receiver may be selected.

```

Shelf: 1 Slot: 11      Total Access System      mm/dd/yy hh:mm
Unacknowledged Alarms:

      Performance History
      Channel 1

      Select the Receiver of Interest

      1. Network Receiver (from Network)
      2. Customer Receiver (from Customer)

      Selection:
  
```

**Figure 18. Performance History Channel # Menu**

### Performance History Fiber Menu

The Performance History Fiber menu (Figure 19) displays the performance of the QDFC and QDFR.

```

Shelf: 1 Slot: 11      Total Access System      mm/dd/yy hh:mm
Unacknowledged Alarms:

      Performance History - Fiber - 24 Hour Data
      QDFC Data                      QDFR Data
      ES-L  SES-L  UAS-L              ES-L  SES-L  UAS-L
01/04  00000  00000  65535          01/04  00000  00000  00000
01/03  00000  00000  65535          01/03  00000  00000  00000
01/02  00000  00000  65535          01/02  00000  00000  00000
01/01  00000  00000  65535          01/01  00000  00000  00000
12/31  -----  -----  -----          12/31  -----  -----  -----
12/30  -----  -----  -----          12/30  -----  -----  -----
12/29  -----  -----  -----          12/29  -----  -----  -----

      1. Definitions              3. 15 Min Data
      2. Reset Fiber Data

      Selection:
  
```

**Figure 19. Performance History Fiber Menu**

The Channel Performance History of the DSX-1 Rx from the network is shown in Figure 20.

Shelf: 1 Slot: 11		Total Access System		mm/dd/yy hh:mm	
Unacknowledged Alarms:					
Channel 1 Performance History - DSX-1 Rx from Network - 24 Hour Data					
Line Data				Path Data	
ES-L	SES-L	LOSS-L	CV-L	ES-P	SES-P UAS-P CV-P
65535	65535	65535	0000000	00000	00000 00000 000000000
01/04	65535	65535	65535	00000000	01/04 00000 00000 00000 00000000
01/03	65535	65535	65535	00000000	01/03 00000 00000 00000 00000000
01/02	65535	65535	65535	00000000	01/02 00000 00000 00000 00000000
01/01	65535	65535	65535	00000000	01/01 00000 00000 00000 00000000
12/31	-----	-----	-----	12/31	-----
12/30	-----	-----	-----	12/30	-----
12/29	-----	-----	-----	12/29	-----

1. Definitions	4. 15 Min Data
2. Reset CH 1 Data	5. View Next Channel
3. Toggle Network/Customer Data	Selection:

**Figure 20. Channel Performance History Screen, from Network**

The Channel Performance History of the DSX-1 from the customer is illustrated in Figure 21.

Shelf: 1 Slot: 11		Total Access System		mm/dd/yy hh:mm	
Unacknowledged Alarms:					
Channel 1 Performance History - DS1 Rx from Customer - 24 Hour Data					
Line Data				Path Data	
ES-L	SES-L	LOSS-L	CV-L	ES-P	SES-P UAS-P CV-P
00000	00000	00000	0000000	00000	00000 00000 00000 0000000
01/05	00000	00000	00000	00000000	01/05 00000 00000 00000 00000000
01/04	00000	00000	00000	00000000	01/04 00000 00000 00000 00000000
01/03	00000	00000	00000	00000000	01/03 00000 00000 00000 00000000
01/02	00000	00000	00000	00000000	01/02 00000 00000 00000 00000000
01/01	00000	00000	00000	00000000	01/01 00000 00000 00000 00000000
12/31	-----	-----	-----	12/31	-----
12/30	-----	-----	-----	12/30	-----

1. Definitions	4. 15 Min Data
2. Reset CH 1 Data	5. View Next Channel
3. Toggle Network/Customer Data	Selection:

**Figure 21. Channel Performance History Screen, from Customer**

### Scratch Pad, Circuit ID Menu

The Scratch Pad, Circuit ID menu (Figure 22) is used to give each circuit a circuit ID name, number, or identity of the users choosing. The scratch pad can be used to make specific notes or reminders.

```
Shelf: 1 Slot: 11      Total Access System      mm/dd/yy hh:mm
Unacknowledged Alarms:

      Ch 1 Circuit ID =
      Ch 2 Circuit ID =
      Ch 3 Circuit ID =
      Ch 4 Circuit ID =

Scratch Pad =

      (1-4). Change Circuit ID
      5. Change Scratch Pad

Selection:
```

**Figure 22. Scratch Pad, Circuit ID Menu**

## Alarm History Menu

The Alarm History menu (Figure 23) provides the options Red, Yellow, and Blue Alarms or PM Threshold Crossing Alarms. A red alarm indicates a loss of signal or loss of framing, a yellow alarm indicates a remote alarm indication, and a blue alarm is an alarm indication signal.

```

Shelf: 1 Slot: 11          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

Alarm History

1. Alarm History - Red, Yellow, and Blue Alarms
2. Alarm History - PM Threshold Crossing Alarms

Selection:
  
```

Figure 23. Alarm History Menu

## T1 Alarm History Screen

The T1 Alarm History screen (Figure 24) displays the alarm history, and the option to select a specific channel.

```

Shelf: 1 Slot: 11          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:
CH 1 Circuit ID:

T1 Alarm History
LOCATION    ALARM      FIRST      LAST      CURRENT  COUNT
-----
QDFC      RED(LDS/LDF) 01/01/00  00:00:05  01/01/00  00:00:05  Alarm  001
(OSX-1)   YELLOW(RAT)  OK        000
          BLUE(AIS)   OK        000
QDFR      RED(LDS/LDF)  OK        000
(OS1)     YELLOW(RAT)  OK        000
          BLUE(AIS)   OK        000

-----
1. Channel 1 Alarms      5. Fiber Alarms
2. Channel 2 Alarms      6. Clear ALL Channel 1 Alarm data
3. Channel 3 Alarms      R. Clear ALL Alarm Data
4. Channel 4 Alarms

Selection:
  
```

Figure 24. T1 Alarm History Screen

### Channel T1 Threshold Alarm History Screen

An individual Channel T1 Threshold Alarm History screen (Figure 25) provides the errored seconds, severely errored seconds, loss of signal seconds, code violation line, and code violation path.

Shelf: 1 Slot: 11		Total Access System		mm/dd/yy hh:mm		
Unacknowledged Alarms:						
CH 1 Circuit ID:						
T1 Alarm History						
LOCATION	THRESH	ALARM	FIRST	LAST	CURRENT	COUNT
QDFC	ESL	15MIN			OK	000
(OSX-1)	SESL	15MIN			OK	000
	LOSSL	15MIN			OK	000
	CVL	15MIN			OK	000
	ESP	15MIN			OK	000
	SESP	15MIN			OK	000
	UASP	15MIN			OK	000
	CVP	15MIN			OK	000

1. Clear ALL CH 1 Data	4. View Next Channel
2. Toggle Network/Customer Data	5. View Fiber Alarms
3. 24 HOUR Data	R. Clear ALL Alarm Data

Selection:

Figure 25. Channel T1 Threshold Alarm History Screen

### Event History Screen

The Event History screen (Figure 26) displays various events that have taken place, including changes to service states and alarms.

Shelf: 1 Slot: 11		Total Access System		mm/dd/yy hh:mm	
Unacknowledged Alarms:					
Num	Description of Event	Date	Time	Source	Port
1.	QDFR Event Log Reset	08/04/04	08:39:54	QDFR	SYS

Page Number: 1/ 1    Number of Events: 1

---

'P' - Previous Page    'H' - Home    'R' - Reset Events  
 'N' - Next Page    'E' - End

Selection:

Figure 26. Event History Screen

## Troubleshooting Menu

The Troubleshooting menu (Figure 27) compiles information received from all facilities and equipment in the circuit and presents them in both Real-Time and 7-Day historical format. The Definitions option from this menu provides definitions of terms and acronyms.

Shelf: 1 Slot: 11		Total Access System	mm/dd/yy hh:mm
Unacknowledged Alarms:			
Troubleshooting			
		Currently Active	Previous 7 Days
CH 1 DSX-1 (Network)	Rx	OK	OK
CH 1 DS1 (Customer)	Rx	LOS	LOS
CH 2 DSX-1 (Network)	Rx	OK	OK
CH 2 DS1 (Customer)	Rx	LOS	LOS
CH 3 DSX-1 (Network)	Rx	OK	OK
CH 3 DS1 (Customer)	Rx	LOS	LOS
CH 4 DSX-1 (Network)	Rx	OK	OK
CH 4 DS1 (Customer)	Rx	LOS	LOS
	QDFC Loop	LOS	LOS
	QDFR Loop	LOS	LOS
1. Troubleshooting Guidance		4. Performance History	
2. Definitions		5. Alarm History	
3. Detailed Status		R. Restart history for this screen selection:	

Figure 27. Troubleshooting Menu

## Troubleshooting Guidance Screen

The Troubleshooting Guidance screen (Figure 28) analyzes this information and makes repair recommendations. The QDFR reads the operational status of the unit and returns Troubleshooting Guidance, or hints, as to the probable cause of the trouble.

Shelf: 1 Slot: 15		Total Access System	mm/dd/yy hh:mm
Unacknowledged Alarms:			
Fiber Loss of Sync			
- A Fiber Loss of Sync (FLOS) condition (OPT LED is solid Red) indicates that end-to-end fiber synchronization does not exist between the fiber devices on a given loop. The problem can exist for any number of reasons, but is most likely related to some kind of loop fault.			
- The condition could be related to a new installation where the field equipment has not yet been installed (or it has been removed in error), but it could also be related to a continuity problem due to facility trouble.			
- If the condition is not due to the lack of termination, clear the office by temporarily connecting an QDFR Remote at the network side of the loop. If the open condition clears, i.e., the FLOS indication goes away (OPT LED is extinguished), the problem is beyond that point.			

Figure 28. Troubleshooting Guidance Screen

## Clear PM and Alarm Histories Option

Selecting the Clear PM and Alarm Histories option from the QDF Main menu, displays the following prompt shown in [Figure 29](#).

```

Shelf: 1 Slot: 11          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                Adtran QDF Main Menu

                                1. QDF Unit Information
                                2. Provisioning
                                3. Status
                                4. Auto In Service
                                5. Loopbacks and Test
                                6. Performance History
                                7. Scratch Pad, Ckt ID
                                8. Alarm History
                                9. Event History
                                10. Troubleshooting
                                11. Clear PM and Alarm Histories
                                12. System PM/Screen Report
                                13. Flash Upgrade
                                14. Virtual Terminal Control

                                This will clear the PM data, Alarm History, and
                                Troubleshooting Histories for the QDFC and the QDFR.
                                Are you sure (Y/N)?

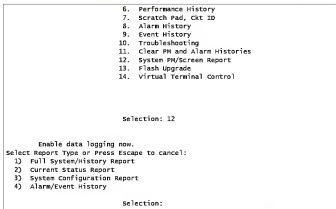
                                Selection: 11
  
```

**Figure 29. Clear PM and Alarm Histories Prompt**

Press Y to clear historical data. The following line appears, to indicate that the PM and alarm histories are being erased: Clearing all Performance and Alarm History.

## System PM/Screen Report Menu

System PM/Screen Report menu (Figure 30) is used to generate system reports.



**Figure 30. System PM/Screen Report Menu**



### Download QDFR via Y-Modem Menu

The Download QDFR via Y-Modem menu (Figure 31) initiates a Y-Modem file transfer from the computer connected to the craft access port to the QDFR. This file is downloaded to the QDFR. The file downloaded to the QDFR should be of the ".bin" file type only and is only provided for feature enhancements/additions and bug fixes.

```

Shelf: 1 Slot: 11          Total Access System          mm/dd/yy hh:mm
Unacknowledged Alarms:

                                Download QDFR via Y-Modem

This utility programs the QDFR. The VT100 terminal emulation
program used must support Y-modem file transfers and have access to
the software binary file (*.bin).

                                1. Start Transfer
                                2. Abort

                                Selection:
  
```

**Figure 31. Download QDFR via Y-Modem Menu**

Figure 32 shows a Flash upgrade session in progress.

```

Choose baud rate for Flash Download: 0: 1
  1. 9600
  2. 19200
  3. 38400
  4. 57600
Choice: 1

Please change your terminal to 9600 and then press the space bar.##

Setup Instructions:

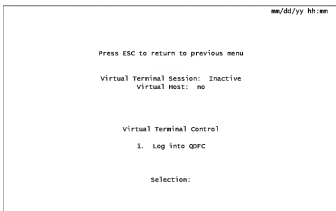
[Note: Your terminal program may differ slightly]
1. Select "Send File" from Transfer options.
2. Set "Transfer Protocol" to the following:
   Xmodem(CRC) or Ymodem
3. Select appropriate binary file (*.BIN) to upload.
4. Upload File.

[Note: The screen will start displaying C's -- this is normal.]
~cccccccccccccccccccccccccccccccccccc
  
```

**Figure 32. Flash Upgrade, Y-Modem in Progress**

### Virtual Terminal Control

The Virtual Control screen allows control of remote unit provisioning from a QDR module. Select the Log into QDFR option from this screen and press ENTER to begin a user-initiated session with a the far-end unit. When the remote session is complete, press CTRL+X to terminate the session.



**Figure 33. Virtual Terminal Control Screen**

## MAINTENANCE

The QDFR does not require routine maintenance for normal operation. In case of equipment malfunction, use the rear panel bantam jack connectors to help locate the source of the problem. ADTRAN does not recommend that repairs be attempted in the field. Repair services may be obtained by returning the defective unit to ADTRAN. Refer to [“Appendix C, Warranty”](#) for further information.

## SPECIFICATIONS

Specifications for the QDFR are detailed in [Table 5](#).

**Table 5. Specifications**

Specification	Description
<b>Environmental</b>	
Operating Temperature:	-40°C to +65°C
Storage Temperature:	-40°C to +85°C
Relative Humidity:	95 percent maximum @ 50°C, noncondensing
<b>Power</b>	
Input Voltage Range:	-24 VDC to -48 VDC input
Maximum Current:	90 mA -48 VDC
Maximum Power Dissipation:	4.32 watts
<b>Physical</b>	
Dimensions:	Height: 1.8 inches Width: 8.0 inches Depth: 9.0 inches
Weight:	2.5 pounds
Mounting:	Wallmount or Desktop
<b>Optical (QDFR)</b>	
Fiber Type:	Single mode
Wave Length:	1310 nm receive and 1550 nm transmit
Optical Budget:	17 ±1 dB
Output Optical Power (P <sub>o</sub> ):	-14 dBm ≤ P ≤ -8 dBm
Receive Level:	-31 ±1 dBm (worst case)
Connector:	Single SC connector
<b>Connectors (QDFR)</b>	
T1 interface:	RJ-48C
Fiber:	Flat SC adapter
<b>Compliance</b>	
Agency Approvals:	UL 60950
<b>Part Number</b>	
Quad Fiber Remote:	1181307L7

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# Appendix A

## QDFR Loopbacks

---

### FIBER LINE UNIT MAINTENANCE MODES

This appendix describes operation of the optical fiber system with regard to detection of in-band and ESF facility data link loopback codes.

Upon deactivation of a loopback, the T1 channel interface will synchronize automatically.

---

#### NOTE

Each T1 channel is independent of the others. The user can enable loopbacks in either direction on any number of T1 channels.

---

### Loopback Process Description

In general, the loopback process for the optical fiber system elements is modeled on the corresponding DS1 system process.

Specifically, the QDFC loopback is similar to an Intelligent Office Repeater loopback, and the QDFR loopbacks are similar to an in-line T1 Repeater loopback.

The unit can detect the loopback activation or deactivation code sequence *only* if an error rate of 1E<sup>-08</sup> or better is present.

## Loopback Control Codes

A summary of control sequences is given in [Table A-1](#). All codes must be sent for a minimum of 5 seconds to be detected and acted upon.

### NOTE

In all control code sequences presented, the in-band codes are shown left-most bit transmitted first, and the ESF data link codes with right-most bit transmitted first.

**Table A-1. Loopback and Control Codes**

Pattern	Description	Source	Arming Required
1in3	Loopdown QDFC and QDFR and disarm	NET CUST	No
3in7	QDFR DS1 loopback to network	NET	No
4in7	QDFC DS1 loopback to network	NET	No
5in7	QDFR DS1 loopback to customer	CUST	No
6in7	QDFC DS1 loopback to customer	CUST	No
3F1E	QDFC DS1 loopback to customer	CUST	No
3F02	QDFR DS1 loopback to customer	CUST	No
3F02	QDFR DS1 loopback to customer	NET	Yes
FF1E	QDFC loopback to network Will not loopup QDFC if QDFC already in loopback to customer	NET	No
FF02	QDFR loopback to network Will not loopup QDFR if any unit already in loopback to customer	NET	No
2in5	Arm QDFC and QDFR QDFR DS1 will loopup (toward Network only) if NIU LB is enabled	NET CUST	No
3in5	Disarm and loopdown QDFC and QDFR Restores Loopback Timeout Override after DSD6	NET CUST	No
D3D3	QDFC DS1 loops up toward pattern: 2 seconds AIS, 5 seconds data, then 231 bit errors toward pattern. 231 bit errors every 20 seconds as long as the pattern is present	NET CUST	Yes
C742	QDFR DS1 loops up toward pattern: 2 seconds AIS, 5 seconds data, and then 20 bit errors toward pattern. 20 errors every 20 seconds as long as pattern present	NET CUST	Yes

**Table A-1. Loopback and Control Codes (Continued)**

Pattern	Description	Source	Arming Required
9393	Loopdown QDFC DS1 – either direction Loopdown QDFR DS1 – customer loopback always, will only loopdown QDFR network loopback if NIU is disabled Does not disarm units if they are armed	NET CUST	No
D5D5	If unit is in loopback towards pattern, errors are periodically injected toward pattern as long as pattern is present QDFC: 231 errors every 20 seconds QDFR: 20 errors every 20 seconds	NET CUST	No
D5D6	Loopback Timeout Override Disables loopback timeout, restores original loopback timeout when unit is disarmed If unit is in loopback towards pattern, errors are periodically injected toward pattern as long as pattern is present QDFC: 231 errors every 20 seconds QDFR (Network loopback): 20 errors every 10 seconds QDFR (Customer loopback): 20 errors every 20 seconds	NET CUST	Yes
FF48	Arm QDFC and QDFR DS1 QDFR will Loopback (toward Network only) if NIU enabled	NET	No
FF24	Loopdown and disarm QDFC and QDFR DS1 Restores Loopback Timeout Override after D5D6	NET CUST	No

- Units must be armed with 11000b or FF48h before this code will work.
- Loopback and error injection will only occur if the in-band code is received by the unit that is to go into loopback. If another loopback blocks the in-band code from being transmitted to the unit that is to go into loopback, loopback and error injection will not occur.

---

**NOTE**

All codes listed above must be sent for a minimum of 5 seconds to be detected and acted upon.

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# Appendix B

## Rear Panel DS1 Test Access

---

### GENERAL

Figure B-1 through Figure B-3 provides a graphical description of the test jack functionality for the QDFR. The test jack can be provisioned to correspond to any of the four T1 channels.

There are two options for selecting the T1 channel to be “connected” to the test jack.

- The first is the front panel switch for channel selection (**CH SELECT**). The LED for the T1 channel will flash if that is the selected channel for the test jack.

For example, if T1 channel 4 corresponds to the test jack, the LEDs for DS1 1, 2, and 3 remain solid while the LED for DS1 4 flashes.

To change the selected channel, momentarily press the **CH SELECT** switch until the desired channel's LED indicator flashes.

- The next option for selecting test jack channel operation is from the Loopbacks and Test\Test Port (Bantam Jack) Control screen. The parameter for this option is Change Test Port Number.

The test jacks can operate as either a terminate jack, also known as intrusive mode, or as a monitor jack, also known as non-intrusive mode. The functionality of the test jack is dependent on the provisioning of Test Jack Mode found under Loopbacks and Test\Test Port (Bantam Jack) Control.

- If this parameter is set to “Monitor”, the test jack can be utilized to monitor the Tx data from the network or from the customer.
- If the parameter is set to “Intrusive”, the test jack can be utilized to connect a test set to allow transmitting and receiving data for troubleshooting purposes.

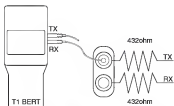
In intrusive mode, the direction of the test jack must also be selected. This parameter is set when Toggle Intrusive Test Direction is changed.

- If the test direction is “Network”, the Tx and Rx data is to and from the network equipment.
- If the test direction is set to “Customer”, the Tx and Rx data is to and from the customer's equipment. Further description of each mode is found on the following pages.

## MONITOR MODE

### Monitor Tx to Customer

The Rx of the monitor BERT receives data from the TX point of the test jack, [Figure B-1](#). This monitors the data that the customer's equipment is receiving from the network equipment.



**Figure B-1. DSX MON, Tx to Customer**

To set up the QDFR for this mode the following sequence must be performed:

1. Select the correct T1 channel to monitor.

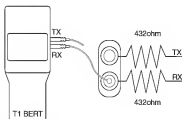
This is accomplished by accessing the front panel switch or from the craft port interface.

2. After the correct T1 channel is selected, verify that the Test Jack Mode is set to "Monitor". If the Test Jack Mode is not set to "Monitor", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Test Jack Mode screen.

The Intrusive Test Direction parameter is not applicable for this mode. In this mode, the data has a monitor jack impedance of 432 ohms. The BERT should be set to a monitor mode. The BERT Tx is not used. This test is non-intrusive.

## Monitor Rx from Customer

The Rx of the monitor BERT receives data from the RX point of the test jack, [Figure B-2](#). This monitors the data that the customer's equipment is transmitting to the network equipment.



**Figure B-2. DSX MON, Rx from Customer**

To set up the QDFR for this mode, the following sequence must be performed:

1. Select the correct T1 channel to monitor.

This selection is accomplished by accessing the front panel switch or from the craft port interface.

2. After the correct port is selected, verify that the test jack mode is set to "Monitor".

If the test jack mode is not set to "Monitor", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Test Jack Mode screen.

The Intrusive Test Direction parameter is not applicable for this mode. In this mode the data has a monitor jack impedance of 432 ohms. The BERT should be set to a monitor mode. The BERT Tx is not used. This test is non-intrusive.

## TERMINATE MODE

### Intrusive Tx to Customer and Rx from Customer

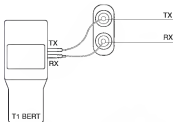
---

#### NOTE

This is an intrusive test and the original data path will be disrupted.

---

The Tx of the BERT connects to the Tx of the test jack. The Rx of the BERT connects to the Rx of the test jack, [Figure B-3](#). The Tx data of the test jack is transmitted to the customer's equipment while the Rx data from the customer is monitored. In this mode the monitor jack impedance of 432 ohms is removed from the data path. The BERT should be set to terminate mode.



**Figure B-3. Terminate Mode**

To set up the QDFR for this mode the following sequence must be performed:

1. Select the correct T1 channel to monitor.

This selection is accomplished by accessing the front panel switch or from the craft port interface.

2. After the correct T1 channel is selected, verify that the Test Jack Mode is set to "Intrusive".

If the Test Jack Mode is not set to "Intrusive", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Test Jack Mode screen.

3. Verify the Intrusive Test Direction parameter is set to "Customer".

If the Intrusive Test Direction parameter is not set to "Customer", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Toggle Intrusive Test Direction screen.

## Intrusive Tx to Network and Rx from Network

---

### NOTE

This is an intrusive test and the original data path will be disrupted.

---

The Tx of the BERT connects to the Tx of the test jack. The Rx of the BERT connects to the Rx of the test jack, [Figure B-3](#). The Tx data of the test jack is transmitted to the network equipment while the Rx data from the network equipment is monitored. In this mode the monitor jack impedance of 432 ohms is removed from the data path. The BERT should be set to terminate mode.

To set up the QDFR for this mode the following sequence must be performed:

1. Select the correct T1 channel to monitor.

This selection is accomplished by accessing the front panel switch or from the craft port interface.

2. After the correct T1 channel is selected, verify that the Test Jack Mode is set to "Intrusive".

If the Test Jack Mode is not set to "Intrusive", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Test Jack Mode screen.

3. Verify the Intrusive Test Direction parameter is set to "Network".

If the Intrusive Test Direction parameter is not set to "Network", change this parameter via the Loopbacks and Test\Test Port (Bantam Jack) Control\Toggle Intrusive Test Direction screen.

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# Appendix C

## Warranty

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### **WARRANTY AND CUSTOMER SERVICE**

ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at [www.adtran.com/warranty](http://www.adtran.com/warranty).

Refer to the following subsections for sales, support, Customer and Product Service (CAPS) requests, or further information.

#### **ADTRAN Sales**

Pricing/Availability:

800-827-0807

#### **ADTRAN Technical Support**

Pre-Sales Applications/Post-Sales Technical Assistance:

800-726-8663

Standard hours: Monday - Friday, 7 a.m. - 7 p.m. CST

Emergency hours: 7 days/week, 24 hours/day

#### **ADTRAN Repair/CAPS**

Return for Repair/Upgrade:

(256) 963-8722

#### **Repair and Return Address**

Contact CAPS prior to returning equipment to ADTRAN.

ADTRAN, Inc.

CAPS Department

901 Explorer Boulevard

Huntsville, Alabama 35806-2807



Carrier Networks Division  
901 Explorer Blvd.  
Huntsville, AL 35806