ADTRAN® AHDSL2 Asynchronous H2TU-C Line Card for Alcatel Litespan® Channel Bank Assemblies Using Wideband Pairs Installation and Maintenance Practice

CONTENTS

FIGURES

TABLES

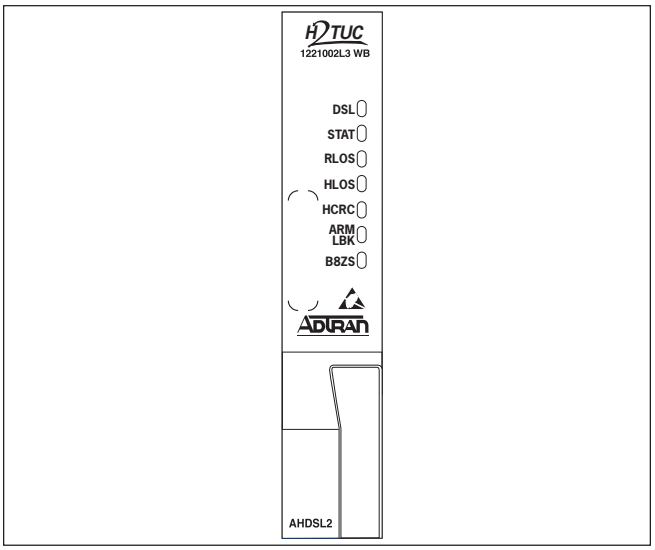

Figure 1. ADTRAN H2TU-C for Litespan

1. GENERAL

The ADTRAN Asynchronous High-bit-rate Digital Subscriber Line 2-wire (AHDSL2) unit, P/N 1221002L3, is to be deployed at Remote Terminal (RT) locations in Alcatel Litespan 2000, 2012, and Starspan systems. A DS1 circuit is extended to the ADTRAN AHDSL2 at the RT from an Alcatel Central Office Terminal (COT) equipped with an Alcatel ADS1U plug-in. The ADTRAN AHDSL2 plug-in functions as an H2TU-C office repeater in a Litespan RT channel bank assembly. It extends an HDSL2 circuit over the Litespan's wideband pairs for distances up to 12,000 feet (24 AWG) on the local loop. The AHDSL2 works in conjunction with standard customer premise remote HDSL2 units

(H2TU-R) as listed below. ADTRAN's Litespan H2TU-C is certified by Alcatel to safely operate in Litespan 2000, 2012, and Starspan systems. The unit is licensed under the T1 Interface Unit H2TU-C channel unit type. **Figure 1** is an illustration of the ADTRAN H2TU-C.

Revision History

This second release of this document updates the TL1 reference material.

Features

- Lightning and power cross-protection, static discharge immunity, and local power bus fusing for line card safety and protection
- 1.552 kbps HDSL2 transmission over a single pair
- Front panel status LEDs
- Performance monitoring and alarm reporting
- Low power consumption
- Span powering for the H2TU-R
- Corrosion-preventive sealing current over a single twisted copper pair
- Troubleshooting functionality

Table 1 lists and defines the H2TU-C Front Panel LED indicators.

Each ADTRAN Litespan H2TU-C line card provides a 1.552 kbps data transport over one unconditioned CSA copper pair. These CSA loops can range up to 12 kft of 24-AWG twisted pair wire.

The Litespan H2TU-C can be used in Litespan 2000, Litespan 2012, and Litespan ONU channel bank assembly (CBA) systems containing Litespan system software versions of 11.0.0 or higher. Each H2TU-C works with the following multiple list versions of the HDSL2 unit remote end (H2TU-R):

Part Number	Description
1222024L6	T200 H2TU-R, Local Power
1223024L9	T200 H2TU-R, Local Power
1221026L6	T200 H2TU-R MON
1222026L6	T200 H2TU-R MON
1222026L9	T200 H2TU-R Q
1223026L9	T200 H2TU-R Q
122x024L7	T200 H2TU-R, Local Power
122x026L1	T200 H2TU-R
122x026L5	T200 H2TU-R B
122x026L7	T200 H2TU-R S

(where x = 1, 2 or 3)

The H2TU-C can be deployed in circuits consisting of one H2TU-C and one H2TU-R. Lightning and power cross-protection is provided at each twisted pair

Table 1. LED Indicators

LED	Indication	Description
DSL	Green	HDSL2 SNR margin is optimum (6 dB or greater)
	Yellow	HDSL2 SNR margin is marginal (1 dB to 5 dB)
	Red	HDSL2 SNR margin is poor (0 dB)
	Flashing	HDSL2 pulse attenuation is >30 dB
STAT	Off	Indicates loss of power to H2TU-C
	Green	Normal operation; H2TU-C is in sync with the H2TU-R
	Flashing Green	Acquiring HDSL2 synchronization with H2TU-R
	Red	Failure indication; unable to start/load firmware
RLOS	Off	DS1 signal from the CPE is present at H2TU-R
	Red	DS1 signal from the CPE is absent at H2TU-R
HLOS	Off	HDSL2 signal achieved
	Red	HDSL2 loss of synchronization
	Flashing Red	DC continuity fault detected on HDSL2 loop
HCRC	Off	No HDSL2 CRC errors within the last 30 minutes
	Yellow	Four or more HDSL2 CRC errors in last 30 minutes
	Red	HDSL2 CRC errors are being detected
ARM/LBK	Off	The unit is not armed or in loopback
	Green	The unit is in loopback
	Yellow	The unit is armed but not in loopback
B8ZS	Green	The line code is B8ZS
	Off	The line code is AMI

interface of the ADTRAN H2TU-C line card. Local power bus fusing is also used to protect the Litespan channel bank backplane, Litespan bank power supplies, and neighboring Litespan line cards in the event of catastrophic line card failure.

The Litespan H2TU-C uses a DC-to-DC converter to derive span powering voltage from the Litespan –48 VDC switched battery supply.

Simplex current of 30 mA of current may be coupled onto the HDSL2 loop span to power the H2TU-R (see **Figure 2**).

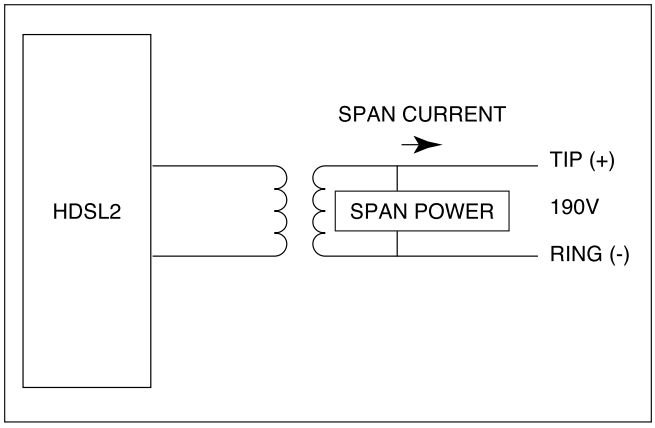

Figure 2. H2TU-C Span Powering Diagram

NOTE

Depending on the type of H2TU-R used in the circuit, different provisioning options will be available.

2. APPLICATIONS

The ADTRAN HDSL2 system provides a cost-effective alternative for deploying T1 service over metallic cable pairs. In contrast with traditional T1 service equipment, ADTRAN HDSL2 can be successfully deployed over one unconditioned, nonloaded, bridged-tapped copper pair CSA loop (see Section 4 of this practice).

Litespan HDSL2 deployment is typically made from a Litespan 2000, Litespan 2012, or Litespan ONU channel bank assembly. **Figure 3** shows possible ADTRAN HDSL2 deployments from a Litespan channel bank assembly. ADTRAN HDSL2 systems can be deployed quickly without the use of expensive T1 repeater equipment on standard CSA loops while using the existing massive copper-fed twisted line pairs in use by the industry.

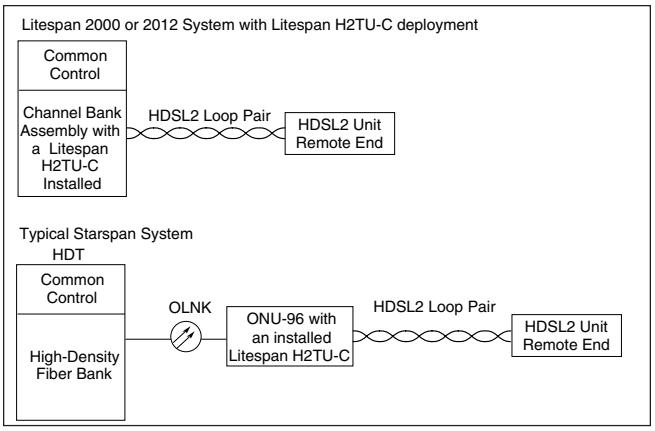

Figure 3. Deployment from a Litespan Channel Bank

ADTRAN uses negative ground-referenced span powering voltage (–190 VDC) on HDSL2 loop. H2TU-R span powering can be disabled to allow locally powered H2TU-R applications, if desired.

3. INSTALLATION

CAUTION!
SUBJECT TO ELECTROSTATIC DAMAGE OR DECREASE IN RELIABILITY.
HANDLING PRECAUTIONS REQUIRED.

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier, then contact ADTRAN. Refer to *Warranty and Customer Service.*

The Litespan H2TU-C plugs directly into a Litespan channel bank assembly channel unit slot. Litespan system software must be version 11.0.0 or higher. The tip and ring connections from the H2TU-C to the shelf are made through the following card edge pins: Wideband Tip - Pin C7; Wideband Ring - C8. This pair is considered the “IN” pair on the slot.

CAUTION

Do not deploy the Litespan H2TU-C into any Litespan channel bank assembly slot that has ADSL Power Distribution Fuse and Alarm (PDFA) connections to the wideband pairs of the channel bank assembly.

This unit supports wideband cabling only on the Litespan RT shelf. Refer to Appendix D for wideband cabling details for the Litespan CBA. For more information regarding cabling, reference Alcatel document *Mechanical Unit Descriptions*, OSP 363-405-270.

Upon insertion of an H2TU-C into an unprovisioned slot, the following occurs:

1. The STAT LED should turn *red* immediately. The STAT LED will remain *red* until the Litespan bank recognizes the insertion of the card and downloads the AHDSL2 channel unit type code into the line card (approximately 15 to 20 seconds).
2. Approximately 3 to 4 seconds after the STAT LED turns *off*, the HLOS LED will turn *red* and remain so until the H2TU-C and H2TU-R units synchronize with each other over the HDSL2 loop.
3. The STAT LED will turn *green* after synchronization of the HDSL2 loop.

WARNING

Prior to installing or removing the Litespan H2TU-C, observe the following warning: If the Litespan H2TU-C is removed from a line card slot, wait at least 15 seconds before reinsertion. If connected to the MTI craft interface terminal, wait until the message "AID:MJ,UEQ." appears (where "AID" is the access identifier). This informs the Litespan common control assembly that the H2TU-C has been removed from its slot, after which the common control assembly begins looking for the reinsertion of the line card. Reinsertion any earlier than this may temporarily lock the H2TU-C into a nonfunctional state because the common control assembly will not send the AHDSL2 equipment type code to the H2TU-C line card.

Compliance

This product is intended for installation in restricted access locations only and in equipment with a Type "B" or "E" enclosure.

WARNING

Up to –200 VDC may be present on telecommunications wiring. The DSX-1 interface is intended for connection to intra-building wiring only. Ensure chassis ground is properly connected.

This product provides span powering voltage (negative only with respect to ground, –190 VDC nominal, GFI protection < 5 mA) and meets all requirements of Bellcore GR-1089-CORE (Class A2), ANSI T1.418-2002. This product is NRTL listed to the applicable UL standards.

Table 2 shows the compliance codes for this product.

Table 2. Compliance Codes

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

Provisioning

Provisioning of the H2TU-C is through the craft interface on the Maintenance and Test Interface (MTI) card either via TL1 commands or the Litecraft Pro Graphical User Interface (GUI). Refer to the *Litecraft Pro Access Configuration Guide* (P/N 61221002L1-31A) for detailed GUI information.

The provisioning and performance monitoring VT100 terminal screens may be viewed from the H2TU-R DB-9 RS-232 craft interface port. However, the provisioning options may not be changed or manipulated in any way from the H2TU-R.

NOTE

Please reference Alcatel document *TL1 Software Reference*, OSP 363-405-502, for detailed information regarding provisioning through the MTI craft interface.

The H2TU-C TL1/Litecraft commands are grouped as follows:

- Administration
- Cross-Connect Provisioning
- Maintenance
- HDSL Provisioning
- T1 Provisioning
- Testing

Administration Commands
Administration commands are used to remove or restore the H2TU-C to service, place equipment and facilities In-Service (IS) and Out-of-Service (OOS), and display system inventory. These commands are listed and defined in **Table 3**.

Cross-Connect Provisioning Commands
Cross-connect Provisioning commands are used to manage cross-connections. These commands are listed and defined in **Table 4**.

Maintenance Commands
Maintenance commands are used to clear Performance Monitoring (PM) information and to display alarm data. **Table 5** lists and defines the available TL1/Litecraft Maintenance commands.

Provisioning Commands
Upon initial insertion of the Litespan H2TU-C into the Litespan system, the configuration options are downloaded automatically to the line card and take precedence over the ADTRAN default provisioning options.

NOTE
The provisioning options stored in the shelf controller can be pre-configured by the user through the Litecraft Pro interface.

Table 6 and **Table 7** list and define the available HDSL provisioning commands. The H2TU-C should be pre-provisioned as indicated under "Pre-Configurable Value."

Table 3. Administration Commands

TL1 Commands	Description
RMV-HDSL	Removes the Litespan H2TU-C from service (OOS)
RST-HDSL	Restores the Litespan H2TU-C to service (IS)
ENT-EQPT	Enters or assigns a unit to a slot position
DLT-EQPT	Deletes or unassigns a unit to a slot position
ED-HDSL or ED-T1	Edits the equipment

Table 4. Cross-Connect Commands

TL1 Commands	Description
ENT-CRS-T1	Enters a cross-connection
DLT-CRS-T1	Deletes a cross-connection
RTRV-CRS-T1	Retrieves existing cross-connections

Table 5. Maintenance Commands

TL1 Commands	Description
INIT-REG-HDSL or INIT-REG-T1	Clears performance monitoring data and sets all values to zero (0)
RTRV-PM-HDSL or RTRV-PM-T1	Retrieves performance monitoring data
RTRV-ALM-HDSL	Retrieves alarms

Table 6. HDSL Provisioning Commands

TL1 Commands	Litecraft Parameters	H2TU-C Options	H2TU-C Available Settings	Corresponding Litecraft Settings	Pre-Configurable Value
ED-HDSL	NIDLPBK	NIU Loopback	Disabled Enabled	NO YES	YES
ED-HDSL	LPBKTMO	Loopback Time Out[1]	0 20 Minutes 60 Minutes 120 Minutes	0 20 60 120	120
ED-HDSL	LPBKACTR	New England Loopback[2]	Disabled Enabled	0000000000000000 0000000000000001	0000000000000000
ED-HDSL	FT1MODE	Latching Loopback	T1 FT1	NO YES	NO
ED-HDSL	LP	Span Power	On Off	SINK SOURCE	SOURCE
ED-HDSL	LPBKDEACTCDE	Customer Loss Indicator[3]	AIS AIS/CI Loopback	0000000000000000 0000000000000001 0000000000000010	0000000000000001
ED-HDSL	LPBKACTC	PRM setting[1,3]	None SPRM NPRM Auto (Both)	0000000000000000 0000000000000001 0000000000000010 0000000000000011	0000000000000001
ED-HDSL	NTWKKPALV	Network Keep Alive	Disabled Enabled	NO YES	NO
ED-GOS-HDS-L	SNR	SNR Margin Alarm Threshold	0 to 15	0 to 15	
ED-GOS-HDS-L	LA	Loop Attenuation Alarm Threshold	0 to 40	0 to 40	

Table 7. T1 Provisioning Commands

TL1 Commands	Litecraft Parameters	H2TU-C Options	H2TU-C Available Settings	Corresponding Litecraft Settings	Pre-Configurable Value
ED-T1	LINECDE	Line Code	AMI B8ZS	AMI B8ZS	B8ZS
ED-T1	FMT	Framing[1]	SF ESF Unframed AUTO	SF ESF Unframed AUTO	AUTO
ED-T1	AT	DS1 TX Level	0 dB -7.5 dB -15 dB	0.0 7.5 15.0	0.0

[1]Some settings may not be available at the H2TU-R.
[2]This option is available only if the H2TU-R P/N 1221026L1 or 1223026L1 is used in the circuit.
[2]This option is not available if the H2TU-R P/N 1221026L6, 1222026L6 or 1223026L1 is used in the circuit.

Testing Commands

The H2TU-C testing commands are used to initiate and terminate loopbacks and to disconnect for testing purposes. **Table 8** lists and defines the TL1/Litecraft testing commands.

CAUTION

Before entering loopbacks, the user needs to remove the card from service. This can be done with the RMV-HDSL command. The card can then be restored to service with the RST-HDSL command.

NOTE

When entering access identification (AID), the user needs to specify whether a loopback command is for a C or an R. For example, AID=RT-1-21-C.

Alarms

The selectable alarm threshold crossing alerts are as follows:

- SNR margin threshold
- HDSL2 and DS1 15-minute ES, SES, UAS thresholds
- HDSL2 and DS1 daily ES, SES, UAS thresholds
- HDSL2 loop attenuation threshold
- DS1 15-minute CV-L, B8ZSS-L, and PDVS-L thresholds
- DS1 daily CV-L, B8ZSS-L, and PDVS-L thresholds

The following additional alarm conditions are provided by the H2TU-C:

- HDSL2 LOSW alarm
- HDSL2 unit failure alarm
- HDSL2 loop continuity alarms
- HDSL2 circuit reset
- DS1 LOS alarm
- H2TU-R AIS, RAI, INCRAI-CI

Power Requirements

When deploying any Litespan H2TU-C, the power requirements for the application should also be considered for product mix calculations and maximum number of Litespan H2TU-Cs within a channel bank assembly. Use Worksheet PW-1 in the "Engineering and Planning" section of Alcatel practice, *OSP TL1 Software Documentation*, release 7.1 or higher, to determine whether a particular combination of channel units is within power-drain specifications.

Table 8. Testing Commands

TL1 Commands	Litecraft Parameters	H2TU-C Options	H2TU-C Available Settings	Corresponding Litecraft Settings
OPR-LPBK-HDSL	LOCN (AID-C)	H2TU-C Network Loopback	Loop Up	NEND
RLS-LPBK-HDSL	LOCN (AID-C)	H2TU-C Network Loopback	Loop Down	NEND
OPR-LPBK-HDSL	LOCN (AID-C)	H2TU-C Customer Loopback	Loop Up	FEND
RLS-LPBK-HDSL	LOCN (AID-C)	H2TU-C Customer Loopback	Loop Down	FEND
OPR-LPBK-HDSL	LOCN (AID-R)	H2TU-R Network Loopback	Loop Up	NEND
RLS-LPBK-HDSL	LOCN (AID-R)	H2TU-R Network Loopback	Loop Down	NEND
OPR-LPBK-HDSL	LOCN (AID-R)	H2TU-R Customer Loopback	Loop Up	FEND
RLS-LPBK-HDSL	LOCN (AID-R)	H2TU-R Customer Loopback	Loop Down	FEND

Table 9 lists the ADTRAN Litespan H2TU-C and H2TU-R factors needed to calculate channel bank power using Worksheet PW-1.

The Table 9 power factors are derived from the power parameters listed in **Table 10**.

4. DEPLOYMENT GUIDELINES

The ADTRAN HDSL2 system is designed to provide DS1-based services over loops designed to comply with carrier service area (CSA) guidelines. CSA deployment guidelines are given below.

1. All loops are nonloaded only.
2. For loops with 26-AWG cable, the maximum loop length including bridged tap lengths is 9 kft.
3. For loops with 24-AWG cable, the maximum loop length including bridged tap lengths is 12 kft.
4. Any single bridged tap is limited to 2 kft.
5. Total bridged tap length is limited to 2.5 kft.
6. The total length of multigauge cable containing 26-AWG cable must not exceed the following:
   $12 - \{(3*L_{26})/(9 - L_{BTAP}\}$ (in kft)
   L_{26} = total length of 26-AWG cable excluding bridged taps (in kft)
   L_{BTAP} = total length of all bridged taps (in kft)

This deployment criteria is summarized in the chart shown in **Figure 4**.

Table 10. Power Parameters

Power Bus	ADTRAN Litespan H2TU-C and AH2TU-R
+5 V	324 mA
-48 V talk battery	125 mA
Power consumption	6 W
Power dissipation	3 W

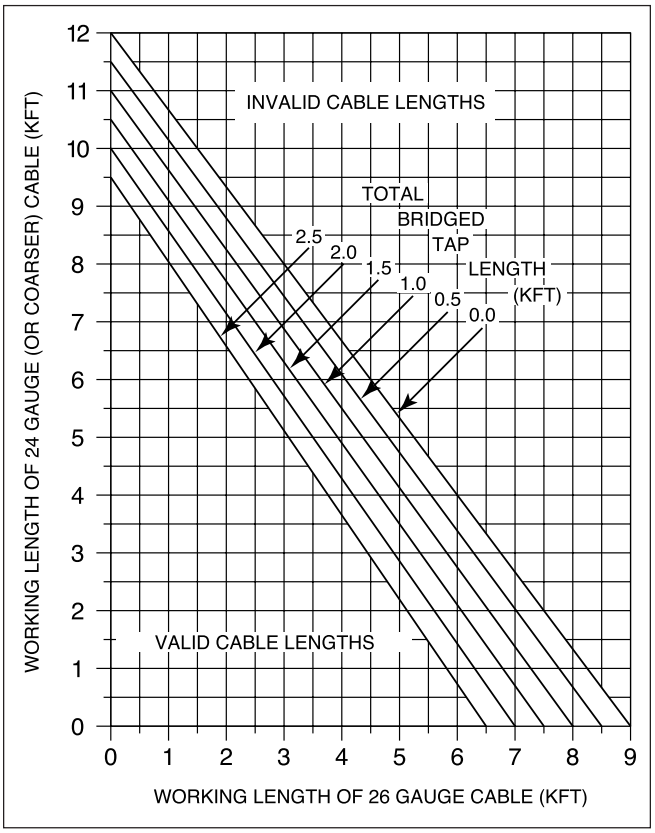

Figure 4. Deployment Guidelines

Table 9. Worksheet PW-1 Factors

Configuration	A Column Factor	B Column Factor	C Column Factor	D Column Factor
ADTRAN Litespan H2TU-R	0.324	NA	NA	0.125

Loop loss per kft for other wire is summarized in **Table 11**.

Table 11. HDSL2 Loss Values

Cable Gauge	Cable Type	Temperature (°F) 68°	90°	120°
26	PIC	3.902	4.051	4.253
26	Pulp	4.030	4.179	4.381
24	PIC	2.863	2.957	3.083
24	Pulp	3.159	3.257	3.391
22	PIC	2.198	2.255	2.333
22	Pulp	2.483	2.450	2.629
19	PIC	1.551	1.587	1.634
19	Pulp	1.817	1.856	1.909

Table 12 provides the recommended maximum local loop loss information for PIC cable at 70ºF, 135 ohms, resistive termination.

An approximation for the maximum amount of wideband noise on an HDSL2 local loop as measured by a 50 kb filter is ≤31 dBrn.

An approximation for the maximum level of impulse noise as measured using a 50 kb filter on an HDSL2 loop is ≤50 dBrn.

Table 12. Loop Insertion Loss Data

Frequency (Hz)	Maximum Loss (dB)
3,000	12.0
10,000	15.0
50,000	25.5
100,000	30.0
150,000	32.75
196,000	35.0
200,000	35.25
250,000	37.50
325,000	42.00

NOTE

These approximations are to be used as guidelines only and may vary slightly on different loops. Adhering to the guidelines should produce performance in excess of 10^{-7} BER.

For further information regarding deployment guidelines, and applications, reference ADTRAN's *Supplemental Deployment Information for HDSLx*, document P/N 61221HDSLL1-10

5. MAINTENANCE

The ADTRAN Litespan H2TU-C requires no routine maintenance. ADTRAN does not recommend that repairs be performed in the field. Repair services may be obtained by returning the defective unit to the ADTRAN Customer and Product Service (CAPS) department.

6. TROUBLESHOOTING PROCEDURES

Table 13 is a troubleshooting guide for the Litespan H2TU-C.

7. PRODUCT SPECIFICATIONS

Product specifications for the ADTRAN H2TU-C are listed in **Table 14**.

8. 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.

U.S. and Canada customers can also receive a copy of the warranty via ADTRAN's toll-free faxback server at 877-457-5007.

- Request Document 414 for the *U.S. and Canada Carrier Networks Equipment Warranty*.
- Request Document 901 for the *U.S. and Canada Enterprise Networks Equipment Warranty*.

Table 13. Troubleshooting Guide

Condition	Solution
At power up, all front panel indicators are *OFF*	1. Verify that the channel bank or ONU BPS power LEDs are on. 2. Make sure that the unit is fully and correctly inserted into the channel bank or ONU. 3. If Step 1 fails, contact Alcatel customer service (800-848-0333). If Step 1 passes, but Step 2 fails, replace the H2TU-C.
The STAT LED remains *RED.*	1. Verify that the channel bank or ONU BPS STAT LEDs are off. 2. Verify that the equipment type for the Litespan H2TU-C slot is AHDSL2. Using TL1, equipment type is shown with the command RTRV-EQPT::AID, where AID is the access identifier (i.e., COT-1-15). 3. If Step 1 fails, contact Alcatel customer service (800-848-0333). If Step 1 and Step 2 pass, replace the H2TU-C. If step 1 passes but Step 2 fails, delete the equipment record (i.e., DLT-EQPT::COT-1-15 with TL1) and reinsert the card, or equip the slot with the currently reserved equipment type.
The STAT LED is *OFF,* but the HLOS LED remains *RED*	1. Confirm that the HDSL2 loop is not open. 2. Confirm that the HDSL2 loop is not shorted. 3. Verify the loop conforms to CSA guidelines and is not too long. Loop loss at 200 kHz should be less than 35.25 dB. 4. Verify that the HDSL2 loop has acceptable noise limits (see Section 4). 5. Verify that tip and ring of the HDSL2 loop belong to the same twisted pair. 6. If Steps 1 through 5 pass, but the HLOS LED remains red, replace the H2TU-C. 7. If Step 6 fails, replace the H2TU-R.
The STAT LED is *OFF,* but the RLOS LED remains *RED.*	1. Check that the framing and line coding are set appropriately for T1 data at the H2TU-R and check for cross-connected T1 data coming to the H2TU-C. 2. Check that the RLOS LED at the H2TU-R is off. 3. If step 1 fails, change the appropriate framing and line coding. If step 1 passes but Step 2 fails, a problem may exist at the H2TU-R T1 interface. If subsequent testing determines that the problem does not exist at the T1interface, replace the H2TU-C.

Table 14. ADTRAN H2TU-C Specifications

Loop Interface	
Modulation Type	16 TC PAM
Mode	Full duplex, partially overlapped echo canceling
Number of Pairs	One
Line Rate	1.552 mbps
Baud Rate	517.333 k baud
Service Range	Defined by CSA guidelines
Loop Loss	35 dB maximum @ 196 kHz
Bridged Taps	Single Taps < 2 kft, total taps ≤ 2.5 kft
Performance	Compliant with T1.418-2000 (draft)
H2TU-C Transmit Power (Data) Level	16.6 ± 0.5 dBm (0 to 450 KHz)
H2TU-C Transmit Power (Activation) Level	16.3 ± 0.5 dBm (0 to 350 KHz)
Input Impedance	135 Ω
Maximum Loop Resistance	900 Ω per span
Return Loss	12 dB (50 kHz to 200 kHz)
Power	
Power Consumption	+5 V: 1.7 watts typical; 48 V (includes H2TU-C and H2TU-R)
Span Power	-190 VDC internally generated from the -48 VDC switch battery
Fusing	-48 VDC (switch battery) is current-limited by a 500 mA Slo-Blo® subminiature surface-mount fuse. +5 VDC is current-limited by a 3 A quick-acting subminiature surface-mount fuse.
Clock	
Clock Sources	Internal, DSX-1 derived
Internal Clock Accuracy	± 25 ppm, (exceeds Stratum 4). Meets T1.101 timing requirements
Tests	
Diagnostics	Local loopback (H2TU-C), remote loopback (H2TU-R)
Physical	
Mounting	Litespan 2000 CBA, Litespan 2012 CBA, or an ONU CBA
Dimensions	4.42 in. high x 0.84 in. wide x 10.4 in. deep (11.22 cm x 2.13 cm x 26.4 cm)
Weight	Less than one pound
Environment	
Temperature	Operating (standard): -40°C to +70°C, Storage: -40°C to 85°C
Humidity	Up to 95% noncondensing
Compliance	
Bellcore GR-1089-CORE (Class 2), ANSI T1.418-2002 NRTL listed to the applicable UL standards	
Part Number	
1221002L3	Asynchronous H2TU-C Line Card Unit (AHDSL2)

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Appendix A
HDSL2 Loopbacks

HDSL MAINTENANCE MODES

This appendix describes operation of the HDSL2 system with regard to detection of in-band and ESF facility data link loopback codes.

Upon deactivation of a loopback, the HDSL2 system will synchronize automatically.

Loopback Process Description

In general, the loopback process for the HDSL2 system elements is modeled on the corresponding DS1 system process. Specifically, the H2TU-C loopback is similar to an Intelligent Office Repeater loopback and the H2TU-R loopbacks are similar to a T1 NIU.

The unit can detect the loopback activation or deactivation code sequence *only* if an error rate of $1E^{-03}$ or greater is present.

Loopback Control Codes

A summary of control sequences is given in **Table A-1**.

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. In-Band Addressable Loopback Codes

Function	Code	Response
1 in 3	100	Loop down everything.
1 in 6	100000	Loopback at the H2TU-R toward the network; must be armed before initiated.
4 in 7	1111000	Loopback data from network toward network in the H2TU-C.
6 in 7	1111110	Loopback data from customer toward customer in H2TU-C.
FF1E	1111 1111 0001 1110	Loopback data from network toward network at H2TU-C.
3F1E	0011 1111 0001 1110	Loopback data from customer toward customer at H2TU-C.
Arm (also known as 2-in-5 pattern)	11000	If the pattern is sent from the network, the units will arm and the H2TU-R will loop up toward the network. No AIS or errors will be sent as a result of this loopback. If the pattern is sent from the customer, all units will arm.
Arm (ESF Data Link)	FF48 1111 1111 0100 1000	If the pattern is sent from the network, the units will arm and an H2TU-R network loopback will be activated. This code has no functionality when sent from the customer.
Disarm (in-band) (also known as 3-in-5 pattern)	11100	When sent from the network or customer, all units are removed from the armed state and loopbacks will be released. If any of the units are in loopback when the 11100 pattern is received, they will loop down. The LBK LEDs will turn off on all units.
Disarm (ESF Data Link)	FF24 1111 1111 0010 0100	When sent from the network or customer, all units are removed from the armed state and loopbacks will be released.
H2TU-C Network Loop Up [1]	D3D3 1101 0011 1101 0011	If the units have been armed and no units are in loopback*, the H2TU-C will loop up, 2 seconds of AIS (all ones) will be transmitted, the looped data will be sent for 5 seconds, and then a burst of 231 logic errors will be injected. The burst of 231 logic errors will continue every 20 seconds as long as the D3D3 pattern is detected. When the pattern is removed, the unit will remain in loopback. If the pattern is re-instated, the injection of 231 logic errors will continue every 20 seconds. If the pattern is sent from the network, the loop up and error injection will be toward the network. If the pattern is sent from the customer, the loopback and error injection will be toward the customer.
H2TU-R Address 20 for extended demarc	C754 1100 0111 0101 0100	When sent from the customer, an H2TU-R network loopback is activated and a 200-bit error confirmation is sent. Two seconds of AIS (all ones) will be sent, 5 seconds of data will pass, and then 200 bit errors will be injected into the DSX-1 signal. As long as the pattern continues to be sent, 200 errors will be injected every 20 seconds. The HDSL2 office unit will not block transmission of far end NIU loopback from the customer premise (H2TU-R).

Note: All codes listed above must be sent for a minimum of 5 seconds in order for them to be detected and acted upon.
***** If NIU is enabled, then the H2TU-R can be in network loopback when the H2TU-C loop up codes are sent.

[1] Units must be armed with 11000b or FF48h before this code will work.
[2] In order to behave like a NIU, the H2TU-R will not loop down from the network side with 9393h.
[3] This code will be detected only if the units are armed or if any loopbacks are active.

Table A-1. In-Band Addressable Loopback Codes (continued)

Function	Code	Response
Loop down [2]	9393 1001 0011 1001 0011	When sent from the network or customer, all units currently in loopback will loop down. Armed units will not disarm. In order to behave like a smartjack, the H2TU-R will not loop down from a network loopback in response to the 9393 pattern if NIU Loopback is enabled.
Query Loopback [1]	D5D5 1101 0101 1101 0101	When the pattern is sent from the network, logic errors will be injected towards the network to indicate a loopback is present toward the network. When the pattern is sent from the customer, logic errors will be injected towards the customer to indicate a loopback is present toward the customer. The number of errors injected is determined by the nearest unit that is in loopback. As long as the pattern continues to be sent, errors are injected again every 20 seconds (H2TU-C = 231 errors), (H2TU-R = 20 errors).
Query Loop Parameters [1]	DBDB 1101 1011 1101 1011	If the H2TU-C is in network loopback and armed, logic errors are injected towards the network upon detection of the DBDB pattern from the network. As long as the pattern continues to be sent, errors are injected again every 20 seconds. The number of errors injected each time depends on the current status of signal margin and pulse attenuation parameters on each loop. If all HDSL2 receiver points (H2TU-C and H2TU-R) indicate pulse attenuation ≤ 30 dB and signal quality (margin) ≥ 6 dB, 111 errors are injected every 20 seconds; otherwise, 11 errors are injected every 20 seconds. This pattern has no functionality when sent from the customer.
Loopback Time Out Override [1,3]	D5D6 1101 0101 1101 0110	If the units are armed or a unit is currently in loopback when this pattern is sent from the network or customer, the loopback time out override feature will automatically disable loopback time out. In other words, the loopback will not time out due to the current loopback time out option setting. As long as the units remain armed, the time out will remain disabled. When the units are disarmed, the loopback time out will revert to the previous loopback time out setting.
Span Power Disable [1,3]	6767 0110 0111 0110 0111	If the units are armed and 6767 is sent from the network or customer, the H2TU-C will disable span power, turning off the H2TU-R. If the pattern is sent from the network, the span power will be disabled as long 6767 pattern is detected. Once the pattern is no longer received, the H2TU-C will reactivate span power. All units will then retrain and return to the disarmed and unlooped state. If the pattern is sent from the customer, the span power will only be disabled momentarily.

Note: All codes listed above must be sent for a minimum of 5 seconds in order for them to be detected and acted upon.
* If NIU is enabled, then the H2TU-R can be in network loopback when the H2TU-C loop up codes are sent.

[1] Units must be armed with 11000b or FF48h before this code will work.
[2] In order to behave like a NIU, the H2TU-R will not loop down from the network side with 9393h.
[3] This code will be detected only if the units are armed or if any loopbacks are active.

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Appendix B
H2TU-C TL1 Provisioning Tutorial

B-1 GENERAL

The purpose of this appendix is to highlight the necessary commands required to provision the ADTRAN AHDSL2 card. A more detailed explanation of shelf specific items may be found in the Alcatel Practice for the Litespan Access Platform (OSP 363-405-000), Volume 6: TL1 Software Reference, and Volume 7: TL1 Messages (OSP 363-405-502).

This tutorial begins with an overview of TL1 commands and how they are entered in the Litespan system. This will be followed by a discussion of the steps required to provision an ADTRAN AHDSL2 (H2TU-C) card.

NOTE

The information in this appendix supports Litespan software releases in the 11.0 series. Command parameters described herein may differ slightly from those in earlier releases of the software. Where differences exist, refer to the appropriate Litespan Standard Practices manual for specific command parameter descriptions.

B-2 TL1 COMMANDS

TL1 commands are used to perform administrative, maintenance, and provisioning tasks on Litespan systems. Commands may be issued from a simple "dumb" computer terminal (often referred to as a craft interface), by a microcomputer running an appropriate terminal emulation program, or by a higher level system capable of issuing TL1 commands in the proper format (such as a Litecraft PC terminal, AMS, or other operations support system software).

B-2.1 TL1 Command Line Conventions

TL1 command description conventions are as follows:

- TL1 parameters are shown between angle parentheses, as in the example **<AID>**. This shows the position of a value to be entered or data to be displayed in a retrieve.
- Colons shown between parameters are literal parameter separators; colons must be used between parameter blocks if the string is to be typed out in command line mode.
- Commas are separators between values for similar parameters. Commas must be used between parameter blocks if the string is to be typed out in command line mode.
- The minimum information needed to execute a command is the command name and all required parameters and leading separators, terminated by a semicolon (;). A semicolon is a command line terminator
- Parameters described as not supported are not used, and no value should be entered.
- Parameter values listed as not supported are reserved for future software releases.

B-2.2 Issuing TL1 Commands

TL1 commands may be issued in command line interface (CLI) mode by typing in the complete command string, along with all parameter entries, or by using a system of "menu" displays and option number entries. Menu entry is useful for the user who is learning TL1, and is largely self-explanatory. Direct CLI mode entry, however, is more concise. This tutorial will focus largely on issuing commands through CLI mode.

NOTE

The tables in this appendix provide detailed information on specific TL1 commands. This information includes a description of the path used to access a command via the menu system.

B-2.3 Command Line Interface Mode

A TL1 command can be issued from the **"<"** prompt by entering the command and all parameter values on one line. This is known as entering a command in CLI mode. The system does not prompt for parameter values in CLI mode; instead, you type in the complete TL1 command string as it is issued to the Litespan system.

TL1 uses four basic syntactical symbols:

- The semicolon (;) is the message terminator. Entry of a semicolon prompts immediate issue of the preceding string for execution.
- Colons (:) are data block delimiters. They enclose and separate data blocks, which are composed of one or more parameters (data units).
- Commas (,) are parameter delimiters. They enclose and separate parameter fields within data blocks.
- Double quotes (") are used to enclose formatted text, especially that to be passed to multivalent parameter fields (such as CONDREC, the condition record parameter).

In CLI mode, the command code is entered first. Do not press <Enter>; the command and its parameters must all be entered together.

The TL1 command code is followed by its parameter list. Parameters are arranged in blocks, which may consist of one or more parameters, and supply all data necessary for execution. Parameter values must be supplied in the proper order, with each block preceded by a colon (:) and parameters within blocks separated by commas (,). The colon serves to position block values correctly in the command string; even blocks for which no values are required must be indicated with colons, so that the next values are properly positioned. Default values may be accepted by use of a colon without a value.

For command codes followed by the terminator semicolon (;) where no data blocks are entered, default values for parameters will be supplied by the system unless parameter entry is required, in which case an error message will be displayed.

After entering a command with all the specified options, the system will display the **EXECUTE?[NO]=** prompt. Enter **Y** or **YES** to execute the command. (The default option for the execute command is always negative (**NO**). Pressing the <Enter> key without typing **Y** or **YES** will not execute the command.)

B-3 LOGGING ON TO THE LITESPAN SYSTEM

To communicate with the Litespan system, the user must log on by providing a unique user identification (UID) and private identification (PID, or password) code for verification by the system. In addition, the user must possess the appropriate security privileges necessary to perform the desired operations.

After connecting a terminal to the Litespan system, the logon prompt "<" will display. Using your pre-assigned UID and PID, type in the Activate User command line:

ACT-USER::<userid>:::<password>;

If the logon is successful the user will receive the following confirmation message:

Litespan2000 02-10-01 09:46:48

M 0 COMPLD

;

<_

Litespan indicates it is ready to receive typed command input by displaying a left angle bracket at the far left of the terminal screen or window, followed by the cursor (underscore). The left angle bracket is the Litespan prompt.

After establishing a connection to the system, it may be necessary to press <CTRL-C>, followed by a semicolon, to receive a prompt.

NOTE

In addition to the M 0 COMPLD message displayed upon logging on the system, Litespan may display automatically generated reports of alarm conditions or performance monitoring threshold crossings depending on how such autonomous messages have been provisioned.

B-4 LOGGING OFF THE LITESPAN SYSTEM

After completing a TL1 session, you should log off the system. Failure to log off may interfere with other users' access to the Litespan system. To log off, type

CANC-USER;

If the logon is successful the user will receive the following confirmation message:

Litespan2000 02-10-01 09:53:33

M 0 COMPLD

/* TL1 Session Log Out For Node Id: RT User Id : <User ID> */

;

<

B-5 H2TU-C INSTALLATION AND INITIAL T1 PROVISIONING

The ADTRAN H2TU-C is an asynchronous DS1 unit that plugs into the Channel Bank Assembly (CBA) of an Alcatel Litespan-2000 or Litespan-2012 optical loop carrier system.

There must be one ADS1U card in the Central Office Terminal (COT) Litespan CBA for each H2TU-C card installed in the Remote Terminal (RT). Install one ADS1U in the COT (or ensure that one is already installed) for each H2TU-C card to be provisioned.

Perform the following steps to install the H2TU-C card into a Litespan CBA and establish basic provisioning for the T1 facility.

NOTE

TL1 commands are shown here in BOLD; variable entries are shown in BOLD ITALICS. Colon and comma sequences must be exact. A semicolon ends the string at any point if the remaining parameters are to be left unchanged or in their default states.

1. Determine if a cross-connect exists for the slot in which the H2TU-C will be inserted; type **RTRV-CRS-T1::<TERMINAL>-<BANK>-<SLOT>;**
   (See **Table B-1** for details on the RTRV-CRS-T1 command.)
2. Does a cross-connect exist on the slot?
   If yes, go to Step 3.
   If no, go to Step 4.

Table B-1. Retrieve T1 Cross-Connection

Command:	**RTRV-CRS-T1**	
Function:	Retrieves T1 cross-connection data.	
Input Format:	**RTRV-CRS-T1**:<TID>:**<AID>**:<CTAG>::::**<PST>,<SST>;**	
Example:	RTRV-CRS-T1::COT-1-10;	
Menu Access:	Main Menu → 3. Provisioning Menu → 2. Cross-Connection Menu → 18. RTRV-CRS-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of either end of the cross-connection. Default = ALL.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<SB>	Specific block	Parameter not allowed.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<PST>	Primary service table	Options: ALL, AS, IS, IS-NR, MA, MT, IS-AB, OOS, OOS-MA, OOS-MA-AS, OOS-MA-UAS, OOS-MT, UAS. Default = ALL.
<SST>	Secondary service table	Options: RDLD or NOT-RDLD. A cross-connection that is redlined (RDLD) cannot be deleted or placed in the OOS-MA state. Entering a cross-connection as RDLD will place both terminating T0s in the RDLD state. Entering a cross-connection as NOT-RDLD will place both terminating T1s in the NOT-RDLD state.
Completion comment: /* <number> T1 Cross-Connections Retrieved */		

3. Remove the existing cross-connect on the slot; type
DLT-CRS-T1::<TERMINAL>-<BANK>-<SLOT>;
(See **Table B-2** for details on the DLT-CRS-T1 command.)

Table B-2. Delete T1 Cross-Connection

Command:	**DLT-CRS-T1**	
Function:	Removes T1 cross-connections from the database.	
Input Format:	**DLT-CRS-T1:**<TID>**:<FROM>,<TO>:**<CTAG>**;**	
Example:	DLT-CRS-T1::RT2-1-12,RT2-1-27;	
Menu Access:	Main Menu →3. Provisioning Menu →2. Cross-Connection Menu →3. DLT-CRS-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<FROM>	From AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection origin. Example: RT2-1-12
<TO>	To AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection destination. Example: RT2-1-27
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<SB>	Specific block	Parameter not allowed.
<PST>	Primary service state	Parameter not allowed.
<SST>	Secondary service state	Parameter not allowed.
Completion comment: /* <number> T1 Cross-Connections Deketed */		

4. Determine whether the slot has previously been assigned to accept a card type other than AHDSL2; type **RTRV-T1::<TERMINAL>-<BANK>-<SLOT>;**
   (See **Table B-3** for details on the RTRV-T1 command.)
5. Is the slot identified with a card type other than AHDSL2?
   If yes, go to Step 6.
   If no, go to Step 7.

Table B-3. Retrieve T1

Command:	**RTRV-T1**	
Function:	Used to retrieve the service provisioning information for T1 facilities.	
Input Format:	**RTRV-T1:**<TID>**:<AID>,<TYPE>:**<CTAG>**:::<PARAM>:<PST>,<SST>;**	
Example:	RTRV-T1::RT-2-15;	
Menu Access:	Main Menu →3. Provisioning Menu →15. T1 Provisioning Menu →8. RTRV-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of T1s to be retrieve.
<TYPE>	Type of unit	Not required.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<PARAM>	Parameters to be retrieved	Not required.
<PST>	Primary service state	Options: IS or OOS. Default = no change.
<PST>	Primary service table	Options: ALL, AS, IS, IS-NR, MA, MT, IS-AB, OOS, OOS-MA, OOS-MA-AS, OOS-MA-UAS, OOS-MT, UAS. Default = ALL.
<SST>	Secondary service state	Options: RDLD or NOT-RDLD. A channel unit that is redlined (RDLD) cannot be deleted or placed in the OOS-MA state.
Completion comment: /* <number> T1 Facilities Retrieved */		

6. Unassign the current card type for the slot; type
   DLT-EQPT::<TERMINAL>-<BANK>-<SLOT>;
   (See **Table B-4** for details on the DLT-EQPT command.)

Table B-4. Delete Equipment

Command:	**DLT-EQPT**	
Function:	Deletes the provisioning information for equipment units.	
Input Format:	**DLT-EQPT**:<TID>:**<AID>**:<CTAG>;	
Example:	DLT-EQPT::COT-1-ONU1-2;	
Menu Access:	Main Menu →3. Provisioning Menu → 4. Equipment Provisioning Menu → 1. DLT-EQPT	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of equipment to be deleted. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
Completion comment: /* <number> Equipment Units Deleted */		

7. Remove the previous unit (card) from the slot, if present.
8. Insert the H2TU-C into the slot. Litespan automatically installs the card with default provisioning data stored in the shelf controller.
9. Retrieve the T1s to be cross-connected with the RTRV-T1 command; type
   RTRV-T1::<TERMINAL>-<BANK>-<SLOT>&<TERMINAL>-<BANK>-<SLOT>;
   (See Table B-3 for details on the RTRV-T1 command.)
   An example of this command string is RTRV-T1::COT-2-15&RT-2-10;
10. Is the secondary service state (SST) of either T1 UEO-MT?
    If yes, go to Step 11.
    If no, go to Step 12.
11. Restore the underlying equipment to service with the RST-EQPT command; type
    RST-EQPT::<TERMINAL>-<BANK>-<SLOT>;
12. Is the primary service state (PST) of either T1 OOS-MT (out of service for maintenance)?
    If yes, go to Step 13.
    If no, go to Step 14.
13. Restore the T1 facility to service with the RST-T1 command; type
    RST-T1::<TERMINAL>-<BANK>-<SLOT>;
14. Is the primary service state (PST) of either T1 OOS-MA (out of service for memory administration)?
    If yes, go to Step 15.
    If no, go to Step 16.

15. Put the T1 facility in service with the ED-T1 command; type
ED-T1::<TERMINAL>-<BANK>-<SLOT>:::::IS;
(See **Table B-5** for details on the ED-T1 command.)

Table B-5. Edit T1

Command:	**ED-T1**	
Function:	Used to modify the provisioning information for T1 facilities.	
Input Format:	**ED-T1:**<TID>**:<AID>,<TYPE>:**<CTAG>**::<AIS>,<AT>,<CONDREC>,<DETECT>,<EQLZ>, <FMT>,<GOS>,<IGLOC>,<LINECDE>,<LP>,<PTTRN>,<SEQ>,<YEL>:<PST>,<SST>;**	
Example:	ED-T1::RT-2-15::::NONE,15;	
Menu Access:	Main Menu → 3. Provisioning Menu → 15. T1 Provisioning Menu → 4. ED-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of T1 to be edited	Enter <TERMINAL>-<BANK>-<SLOT> of facility to be edited.
<TYPE>	Equipment type	Not required.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<AIS>	Alarm Indication Signal	Options: NONE, ALLZEROS, ALLONES, TR008ALLONES Valid for DS1U, DS1M, T1U, ADS1U, AHT1U, AT1U, HT1U, AHDSL, and AHDXL.
<AT>	Attenuation (in dB)	Options: 0, 7.5, 15, or 22.5. Default = no change Valid for T1U, AT1U, AHT1U, HT1U, AHDSL, and AHDXL.
<CONDREC>	Condition Record	Not required.
<DETECT>	Idle detection	Options: AUTO, YES, and NO. Default = no change. Valid for ADS1U, AT1U, AHDSL, and AHDXL.
<EQLZ>	Equalization, in feet	Not required.

Table B-5. Edit T1 (Continued)

Parameter Usage		
Code	**Definition**	**Description**
<FMT>	Framing format	Options: CLEAR, ESF, SF, UNFR, AUTO Note: Facility must be OOS to modify FMT field. Values other than AUTO are valid for DS1U, T1U, HT1U, or DS1M. AUTO is valid only for AHDSL or AHDXL. When CLEAR is used, LINECDE must be AMI.
<GOS>	AID of GOS table to be used	Enter <Terminal>-GOS<GosNum>. Default = GOS1 Example: RT-GOS1
<IGLOC>	Interface group location	Not applicable.
<LINECDE>	Line code	Options: AMI, B8ZS, BIT7, AUTO
<LP>	Line Powering	Not required.
<PTTRN>	Idle pattern	The PTTRN field indicates the detectable idle pattern. The values are hex values: 0F, 17, 1B, 77, 7F, 88, 8F, FF. Valid for ADS1U, AT1U, AHDSL, and AHDXL.
<SEQ>	Channel sequence	Not required.
<YEL>	Yellow alarm	The ability to recognize/transmit a yellow signal, and generate a yellow alarm. Options: Yes or No. Valid for T1U, HT1U, DS1U, AHT1U, AHDSL, and AHDXL.
<PST>	Primary service state	No user entry needed. Default = no change.
<SST>	Secondary service state	No user entry needed. Default = no change.
Completion comment: /* <number> T1 Facilities Edited */		

16. Enter a T1 cross-connection between the H2TU-C and a ADS1U in the CBA; type
ENT-CRS-T1::<Node 1 T1 Access ID>,<Node 2 T1 Access ID>;
(See Table **B-6** for details on the ENT-CRS-T1 command.)

Table B-6. Enter T1 Cross-Connection

Command:	**ENT-CRS-T1**	
Function:	Adds a T1 cross-connections to the database.	
Input Format:	**ENT-CRS-T1**:<TID>:**<FROM>,<TO>**:<CTAG>::::**<PST>,<SST>;**	
Example:	ENT-CRS-T1::COT-1-10,COT-OCE-1-27;	
Menu Access:	Main Menu → 3. Provisioning Menu → 2. Cross-Connection Menu → 12. ENT-CRS-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<FROM>	From AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection origin. Grouping and ranging are supported. Example: RT2-1-12
<TO>	To AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection destination. If used, the number of circuits specified must equal the number specified by FROM AID. Grouping and ranging are supported. Example: RT2-1-27
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<SB>	Specific block	Parameter not allowed.
<PST>	Primary service table	Options: IS or OOS. Default = no change.
<SST>	Secondary service table	Options: RDLD or NOT-RDLD. Default = no change.
Completion comment: For end-to-end cross-connections: "<From AID>,<From-VT AID>,<To-VT AID>,<To AID>"/* <number> T1 Cross-Connections Entered */ For half cross-connections: "<From AID>,<To AID>"/* <number> T1 Cross-Connections Entered */		

17. Modify the provisioning data for the H2TU-C to set the Line Code parameter to B8ZS; type
ED-T1::<TERMINAL>-<BANK>-<SLOT>::::LINECDE=B8ZS;
(See Table B-5 for details on the ED-T1 command.)

NOTE

The H2TU-C ships with a Line Code default of B8ZS; however, the Litespan automatic default assignment changes the Line Code setting to AUTO when the H2TU-C is installed. To deliver Hi-Cap service, this parameter should be returned to B8ZS

B-6 HDSL PROVISIONING

To modify the provisioning information for HDSL facilities, use the command ED-HDSL. (See **Table B-7** for details on this command.)

Table B-7. Edit HDSL

Command:	**ED-HDSL**	
Function:	Used to modify the provisioning information for HDSL facilities.	
Input Format:	**ED-HDSL**:<TID>:**<AID>,<TYPE>**:<CTAG>:::**<DS0BLK>,<GOS>,<HAIS>,<LP>, <LPBKACTC>,<LPBKACTR>,<LPBKDECTCDE>,<LPBKTMO>,<LPBKTMODEACT>, <NIDLPBK>,<NTWKKPALV>,<PRGMLPBKC>,<PRGMLPBKR>,<SNGLLP>:<PST>,<SST>;**	
Example:	ED-HDSL::RT-4-21::::,1;	
Menu Access:	Main Menu → 3. Provisioning Menu → 6. HDSL Provisioning Menu → 2. ED-HDSL	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of facility to be edited. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands.
<TYPE>	Equipment type	Options: ALL, AHDSL, AHDXL, or AHDSL2.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<ALMP>	Alarm pattern	Options: AIS, LOS
<DS0BLK>	DS0-level blocking	24-bit field representing the channels to be blocked. Default = no change
<FT1MODE>	Latching Loopback	Options: NO, YES
<GOS>	AID of GOS table to be used	<Terminal>-GOS<GosNum>. A GOS table cannot be assigned unless it has already been defined. GOS1 is the system default. Default = no change.

Table B-7. Edit HDSL (Continued)

Parameter Usage		
Code	**Definition**	**Description**
<HAIS>	Half AIS	Options: NO, YES. Default = no change. YES = AIS is transmitted when either HDSL loop detects LOSW. NO = AIS is transmitted when both HDSL loops detect LOSW.
<LP>	Line Powering	Options: SOURCE, SINK. Default = no change. SOURCE = Enable line powering, current source. SINK = Disable line powering, current sink.
<LPBKACTC>	Loopback activation code, H2TU-C	16-bit code used to activate the inband loopback at the HTU-C. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBKACTR>	Loopback activation code, H2TU-R	16-bit code used to activate the inband loopback at the HTU-R. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBKDEACTCDE>	Loopback deactivation code	16-bit code used to deactivate the inband loopback. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBKTMO>	Loopback timeout period	0, 20, 60, or 120 (minutes). An entry of 0 disables timeout. Default = no change.
<NIDLPBK>	Network interface device loopback	Determines if the HTU-R shall respond to loopback request codes. Options: YES, NO.
<NTWKKPALV>	Network keep-alive	Options: YES, NO. Determines whether the HTU-C will automatically loop back toward the network when it receives LOS or AIS from the HTU-R.
<PRGMLPBKC>	Programmable loopback mode, HTU-C	Options: YES, NO.
<PRGMLPBKR>	Programmable loopback mode, HTU-R	Options: YES, NO.
<RACIMODE>	Remote Alarm Indication – Customer Installation	Options: YES, NO.
<SNGLLP>	Single loop mode	Options: YES, NO.
<PST>	Primary service table	Options: IS, OOS.
<SST>	Secondary service table	Parameter not allowed.
Completion comment: /* <number> HDSL Facilities Edited */		

B-6.1 Initial HDSL Provisioning

Several HDSL provisioning parameters for the H2TU-C must be changed from their default settings prior to turning up the circuit. (Refer to Table 6, “HDSL Provisioning Commands” on page 6 of this I&M for more information on these command options.)

Using the Edit HDSL command (ED-HDSL), execute the following command string to provide initial HDSL provisioning:

ED-HDSL::RT-1-24::::,,,,,,0000000000000001,,0000000000000001,120,,YES;

B-7 SELECTED TL1 COMMANDS FOR PROVISIONING, MAINTENANCE, AND TESTING

The following commands are used to perform perform provisioning, maintenance, and testing tasks on T1 and HDSL facilities as they relate to the ADTRAN H2TU-C. For additional information on these commands, refer to the applicable table associated with a specific command.

B-7.1 Edit T1 Grade of Service

Another aspect of provisioning the H2TU-C involves the modification of T1 grade-of-service tables to set performance-monitoring threshold levels for various alarm/event conditions. To modify an existing T1 GOS table, use the command **ED-GOS-T1**. (See **Table B-8** for details on this command.) The selection of appropriate parameter options will depend upon the user's specific requirements.

Table B-8. Edit T1 Grade of Service

Command:	**ED-GOS-T1**	
Function:	Allows modification of grade-of-service tables for T1 facilities. GOS tables allow the user to set performance monitoring threshold levels for various alarms/event conditions. There are 15 GOS tables available for each type of service.	
Input Format:	**ED-GOS-T1**:<TID>:**<AID>**:<CTAG>:::**<MONTYPE>,<THLEV>,<TMPER>;**	
Example:	ED-GOS-HDSL::COT-GOS2::::SESL,50,1-HR;	
Menu Access:	Main Menu →3. Provisioning Menu → 15. T1 Provisioning Menu → 3. ED-GOS-T1	
Note:	Only tables that have already been entered can be edited. The parameters for only one monitored type are edited each time the command is issued; the rest of the monitored values remain unchanged. To edit the entire GOS table, the ED-GOS command must be issued for each monitored type.	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of GOS table to edit	Enter <Terminal>-GOS<GosNum>.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<MONTYPE>	Monitored parameter type	Used to specify the type of monitored T1 parameter. Options: BERL-L, BERL-P, BERL-H, CSSP, CVL, CVP, ESL, ESP, LASL, SEFSP, SESL, SESP, UASL, UASP, USSL, B8ZSSL, LOSSL, PDVSL, SESCVSL, SESCVSP. Default = no change
<THLEV>	Threshold level	Each monitored type has its own threshold level. Default = no change.
<TMPER>	Time period	Used to specify the time period for collection of GOS data. Options: 15-MIN, 1-DAY. Default = 15-MIN
<PST>	Primary service state	Parameter not allowed.
<SST>	Secondary service state	Parameter not allowed.
Completion comment: /* <number> T1 Grade Of Service Tables Edited */		

B-7.2 Initialize T1 Registers

To reset T1 performance-monitoring registers to zero, use the command **INIT-REG-T1**. (See **Table B-9** for details on this command.) The selection of appropriate parameter options will depend upon the user's specific requirements.

Table B-9. Initialize T1 Register

Command:	**INIT-REG-T1**	
Function:	Resets the specified performance-monitoring register contents to zero. This command affects only the current state of the register; data recorded for previous time periods is unaffected.	
Input Format:	**INIT-REG-T1:**<TID>**:<AID>:**<CTAG>::**<MONTYPE>,,<LOCN>,,<TMPER>;**	
Example:	INIT-REG-T1::COT-1-12:::CVL,,,,1-HR;	
Menu Access:	Main Menu → 2. Maintenance Menu → 20. T1 Maintenance Menu → 5. INIT-REG-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to identify the facilities for which performance-monitoring registers will be initialized. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type to specify the performance-monitoring registers to be initialized. Options: MS, CVL, ESL, LASL, SESL, UASL, USSL, CSSP, CVP, ESP, SEFSP, SESP, UASP, BERL, LOSSL, B8ZSSL, PDVSL or ALL. Default = ALL.
<MONVAL>	Monitored value	Parameter not allowed.
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network performance-monitoring registers. Enter FEND (far end) for Customer performance-monitoring registers.
<TMPER>	Time period	Enter the time period for which PM registers are initialized. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Parameter not allowed.
<MONTM>	Monitored time	Parameter not allowed.
Completion comment: /* Registers Initialized On <number> T1 Facilities */		

B-7.3 Retrieve T1 Performance Monitoring

To retrieve performance-monitoring data recorded for a designated T1 facility, use the command **RTRV-PM-T1**. (See **Table B-10** for details on this command.)

Table B-10. Retrieve T1 Performance Monitoring

Command:	**RTRV-PM-T1**	
Function:	Retrieves performance-monitoring data recorded for the designated T1 facilities.	
Input Format:	**RTRV-PM-T1:**<TID>**:<AID>:**<CTAG>**::<MONTYPE>,<MONLEV>,<LOCN>,**<DIRN>**, <TMPER>, <MONDAT>,<MONTM>;**	
Example:	RTRV-PM-T1::COT-1-13:::CVL,,,,1-DAY,7-22,14-00;	
Menu Access:	Main Menu →2. Maintenance Menu → 20. T1 Maintenance Menu → 15. RTRV-PM-T1	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to retrieve performance monitoring data for the facilities specified. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type for which PM data will be retrieved. Options: MS, CVL, ESL, LASL, SESL, UASL, USSL, CSSP, CVP, ESP, SEFSP, SESP, UASP, BERL, LOSSL, B8ZSSL, PDVSL, or ALL. Default = ALL.
<MONLEV>	Monitored level	Data exceeding the level specified by this field will be retrieved. For example, a value of 4 will retrieve data only for events occurring 4 times or more. Default = 0 (all data retrieved).
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network data. Enter FEND (far end) for Customer data.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for which data is retrieved. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Used to specify the date from which data is retrieved. Enter <MM>-<DD> && <MM>-<DD>. <MM> = 1—12, <DD> = 1—31
<MONTM>	Monitored time	Used to specify the time of day for which data is retrieved. Enter <HH>-<MM> && <HH>-<MM>. <HH> = 0—23, <MM> = 0—59.
Completion comment: /* Performance Data On <number> T1 Facilities Retrieved */		

B-7.4 Edit HDSL Grade of Service

To modify the grade-of-service tables for an existing HDSL facility, use the command **ED-GOS-HDSL**. (See Table **B-11** for details on this command.)

Table B-11. Edit HDSL Grade of Service

Command:	**ED-GOS-HDSL**	
Function:	Allows modification of grade-of-service tables for HDSL facilities. GOS tables allow the user to set performance monitoring threshold levels for various alarms/event conditions. There are 15 GOS tables available for each type of service.	
Input Format:	**ED-GOS-HDSL**:<TID>:**<AID>**:<CTAG>:::**<MONTYPE>,<THLEV>,<TMPER>;**	
Example:	ED-GOS-HDSL::COT-GOS2::::SESCVS,200,15-MIN;	
Menu Access:	Main Menu →3. Provisioning Menu →6. HDSL Provisioning Menu →6. ED-GOS-HDSL	
Note:	Only tables that have already been entered can be edited. To edit the entire GOS table, the ED-GOS command must be issued for each monitored type. The parameters for only one monitored type are edited each time the command is issued; the rest of the monitored values remain unchanged.	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of GOS table to edit	Enter <Terminal>-GOS<GosNum>.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<MONTYPE>	Monitored parameter type	Used to specify the type of monitored HDSL parameter. Options: ES, SES, UAS, LA, SESCVS, BER, SNR, LOSWS, CV. Default = no change.
<THLEV>	Threshold level	Each monitored type has its own threshold level. Default = no change.
<TMPER>	Time period	Used to specify the time period for collection of GOS data. Options: 1-DAY, 1-HR, 15-MIN.
<PST>	Primary service state	Parameter not allowed.
<SST>	Secondary service state	Parameter not allowed.
Completion comment: /* <number> HDSL Grade Of Service Tables Edited */		

B-7.5 Initialize HDSL Registers

To reset HDSL performance-monitoring registers to zero, use the command **INIT-REG-HDSL**. (See T**able B-12** for details on this command.)

Table B-12. Initialize HDSL Registers

Command:	**INIT-REG-HDSL**	
Function:	Resets the specified performance-monitoring register contents to zero. This command affects only the current state of the register; data recorded for previous time periods is unaffected.	
Input Format:	**INIT-REG-HDSL**:<TID>:**<AID>**:<CTAG>::**<MONTYPE>,,<LOCN>,,<TMPER>;**	
Example:	INIT-REG-HDSL::<COT-2-4>:::<SNL-R>,,,,<15-MIN>;	
Menu Access:	Not listed in any Litespan menu, but available for execution.	
Note:	The designated HDSL facilities must be in service (IS) prior to initialization.	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of the DS1U card to which the T1 circuit will be associated. Example: RT-1-35 Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type to specify the performance-monitoring registers to be initialized. Options: ES, SES, UAS, MS, LOSWS, CV, LA, SNRMIN, or ALL. Default = ALL.
<MONVAL>	Monitored value	Parameter not allowed.
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network registers. Enter FEND (far end) for Customer registers.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for registers to be initialized. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Parameter not allowed.
<MONTM>	Monitored time	Parameter not allowed.
Completion comment: /* Registers Initialized On <number> HDSL Facilities */		

B-7.6 Retrieve HDSL Performance Monitoring

To retrieve HDSL performance-monitoring data, use the command **RTRV-PM-HDSL**. (See **Table B-13** for details on this command.)

Table B-13. Retrieve HDSL Performance Monitoring

Command:	**RTRV-PM-HDSL**	
Function:	Retrieves performance-monitoring data recorded for the designated HDSL facilities.	
Input Format:	**RTRV-PM-HDSL**:<TID>:**<AID>**:<CTAG>::**<MONTYPE>,<MONLEV>,<LOCN>,** <DIRN>**,<TMPER>,<MONDAT>,<MONTM>;**	
Example:	RTRV-PM-HDSL::COT-2-11:::SES;	
Menu Access:	Not listed in any Litespan menu, but available for execution.	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to retrieve performance monitoring data for the facilities specified. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type for performance-monitoring data to be retrieved. Options: ES, SES, UAS, MS, LOSWS, CV, LA, SNRMIN, or ALL. Default = ALL.
<MONLEV>	Monitored level	Data exceeding the level specified by this field will be retrieved. For example, a value of 4 will retrieve data only for events occurring 4 times or more. Default = 0 (all data retrieved).
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network data. Enter FEND (far end) for Customer data.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for which data is retrieved. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Used to specify the date from which data is retrieved. Enter <MM>-<DD> && <MM>-<DD>. <MM> = 1—12, <DD> = 1—31
<MONTM>	Monitored time	Used to specify the time of day for which data is retrieved. Enter <HH>-<MM> && <HH>-<MM>. <HH> = 0—23, <MM> = 0—59.
Completion comment: /* Performance Data On <number> HDSL Facilities Retrieved */		

B-7.7 Retrieve HDSL Alarms

To retrieve a list of standing HDSL alarms, use the command **RTRV-ALM-HDSL**. (See **Table B-14** for details on this command.)

Table B-14. Retrieve HDSL Alarms

Command:	**RTRV-ALM-HDSL**
Function:	Retrieves a list of standing HDSL alarms associated with the designated facilities.
Input Format:	**RTRV-ALM-HDSL**:<TID>:**<AID>**:<CTAG>::**<NTFCNCDE>,<CONDTYPE>,<SRVEFF>,** <LOCN>,<DIRN>,<TMPER>;
Example:	RTRV-ALM-HDSL::COT-2-50:::MJ,LOS,SA;
Menu Access:	Main Menu →2. Maintenance Menu →6. HDSL Maintenance Menu →5. RTRV-ALM-HDSL
Note:	Standing alarms are not retrieved for facilities that are out of service for maintenance (OOS-MT).

Parameter Usage

Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] for a list of standing HDSL alarms (if any) for the facilities specified. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<NTFCNCDE>	Notification code	Used to retrieve a list of the alarms of the severity indicated. Options: CR, MJ, MN, or NR. Default = ALL.
<CONDTYPE>	Condition type	Used to retrieve a list of the alarms of the type indicated. Options: MSGLOST, LOSW, DCCONT, T-SNRL, T-BER, AIS, LOS, OGAIS, T-BERL-L, T-BERL-P, T-BERL-H, PATTERNDETECT, YEL, INCRAI-CI, T-LA. Default = ALL.
<SRVEFF>	Service affect	Used to retrieve a list of the alarms with the service affect indicated. Options: SA, NSA, ALL. Default = ALL.
<LOCN>	Location	Not supported.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Not supported.

Completion comment:
/* <number> Alarms On <number> HDSL Facilities Retrieved */

B-7.8 Operate HDSL Loopback

To activate loopback of an HDSL facility, use the command **OPR-LPBK-HDSL**. (See **Table B-15** for details on this command.)

Table B-15. Operate HDSL Loopback

Command:	**OPR-LPBK-HDSL**	
Function:	Activates loopback of an HDSL facility.	
Input Format:	**OPR-LPBK-HDSL**:<TID>:**<AID>**:<CTAG>:::**<LOCN>;**	
Example:	OPR-LPBK-HDSL::RT-3-50-C;	
Menu Access:	Main Menu →4. Testing Menu →1. OPR-LPBK-HDSL	
Note:	Facilities must be placed in the out of service for maintenance (OOS-MT) service state using the RMV-HDSL command.	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of the HDSL to be placed in loopback. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network loopback. Enter FEND (far end) for Customer loopback. Default = NEND.
<ORGN>	Origin	Parameter not allowed.
Completion comment: /* Loopback on <number> HDSL Facilities Operated */		

B-7.9 Release HDSL Loopback

To deactivate loopback of an HDSL facility, use the command RLS-LPBK-HDSL. (See **Table B-16** for details on this command.)

B-8 TL1 COMMAND TABLES

The following pages contain tables of detailed information for most of the TL1 commands used in this appendix. This information includes the command name (code), a description of its function, input format, an example of the input code, a descriptive path for menu access of the command, and command parameter codes, definitions, and descriptions.

Table B-16. Release HDSL Loopback

Command:	**RLS-LPBK-HDSL**	
Function:	Deactivates loopback of an HDSL facility.	
Input Format:	**RLS-LPBK-HDSL**:<TID>:**<AID>**:<CTAG>:::**<LOCN>;**	
Example:	RLS-LPBK-HDSL::COT-3-50-R:::NEND;	
Menu Access:	Main Menu →4. Testing Menu →9. RLS-LPBK-HDSL	
Parameter Usage		
Code	**Definition**	**Description**
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of the HDSL to be released from loopback. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<LOCN>	Location	Options: ALL, FEND, NEND or LINE.
<ORGN>	Origin	Parameter not allowed.
Completion comment: /* Loop Back on <number> HDSL Facilities Released */		

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Appendix C
Metallic Test Access Unit (MTAU) Testing Capabilities

This appendix describes the testing functionality available for the ADTRAN H2TU-C card via the MTAU unit. For a complete description of the MTAU unit refer to Alcatel document *Common Equipment Unit Descriptions*, OSP 363-405-250.

NOTE

The functionality of the SPLIT and MON features detailed in this document supercedes that shown in the OSP 363-405-250.

INITIATING MTAU TEST ACCESS

CONN-JACK-T1

The Connect T1 Jack command connects a T1 or HDSL facility to the MTAU via the channel bank test bus.

Input Format: **CONN-JACK-T1**:<TID>:<**AID**>:<CTAG>::<**MD**>;

AID = Access ID of the unit to be connected to the MTAU

MD = Mode (SPLIT or MON)

Example: CONN-JACK-T1::COT-1-15:::SPLIT;

NOTE

To use SPLIT mode, a facility must be out of service for maintenance or out of service for memory administration.

Diagrams of the functionality of the two modes are shown below:

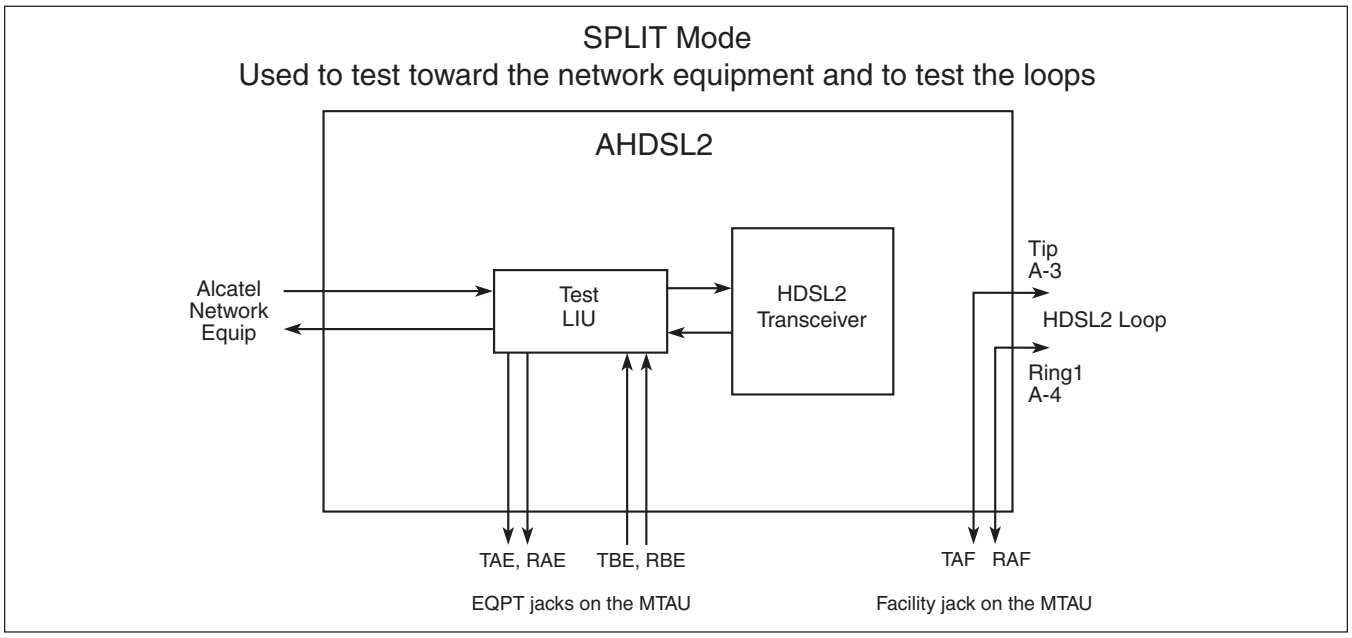

Figure C-1. SPLIT Mode

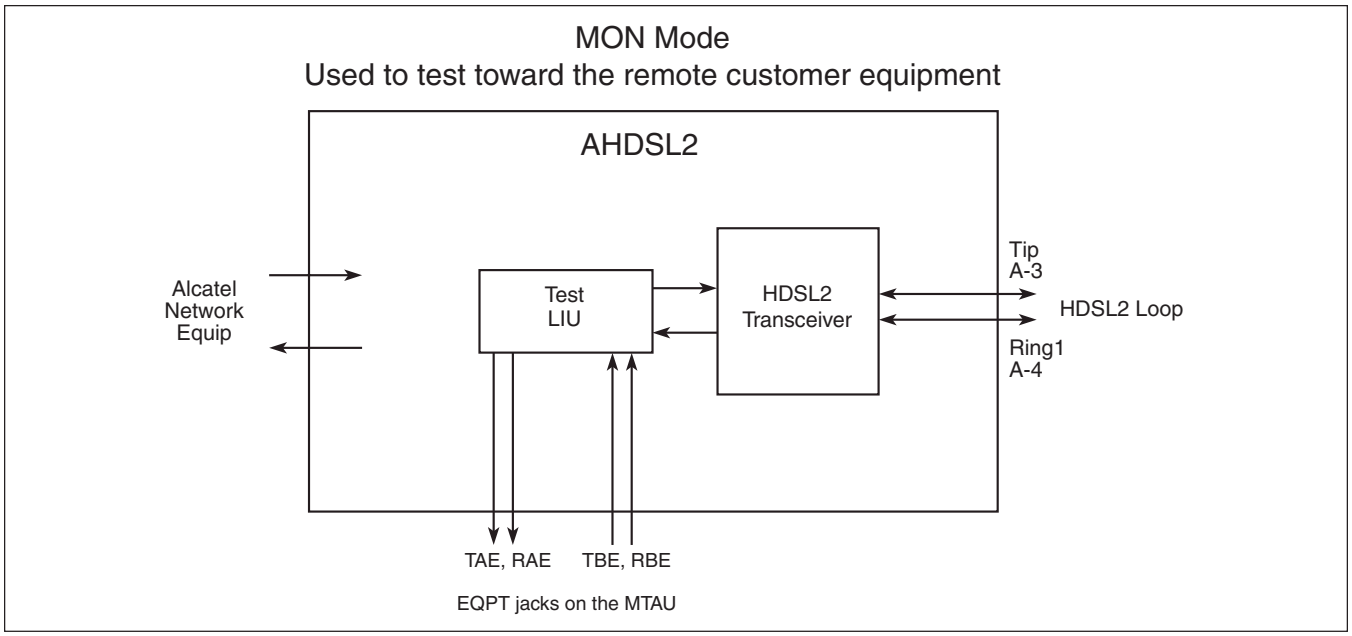

Figure C-2. MON Mode

REMOVAL OF MTAU TEST ACCESS

DISC-JACK-T1

The Disconnect T1 Jack command disconnects a T1 or HDSL facility from the metallic test access unit (MTAU).

Input Format: **DISC-JACK-T1**:<TID>:<**AID**>:<CTAG>;

Example: DISC-JACK-T1::COT-1-15;

NOTE

AIDs of T1 or HDSL facilities currently connected can be determined using the RTRV-STATUS-MTAU command.

Appendix D
CBA Wideband Cabling Details

Table D-1 below lists the wideband cabling details for the Litespan CBA shelf. The first column identifies the color code of each pair. The second and third columns list the tip-ring pin numbers of either the 710 (or 3M) cable or the AMP cable provided by the CBA. The even-numbered cable columns (J2, J4, and J6) list the Slot number/HDSL2 assignment to Loop 1. The corresponding Pair columns list the pairs in sequential order; pairs 97 through 100 have no connection (N/C).

Table D-1. CBA Wideband Cabling/HDSL2 Loop 1 Assignments

Color Code (Base/Ink)	Pin # (T – R)		J2		J4		J6	
Tip – Ring	710 or 3M	AMP	Slot	Pair	Slot	Pair	Slot	Pair
Wh/Bl – Bl/Wh	1 – 2	26 – 1	1-HDSL2-L1	1	21-HDSL2-L1	41	41-HDSL2-L1	81
Wh/Or – Or/Wh	3 – 4	27 – 2	2-HDSL2-L1	2	22-HDSL2-L1	42	42-HDSL2-L1	82
Wh/Gr – Gr/Wh	5 – 6	28 – 3	3-HDSL2-L1	3	23-HDSL2-L1	43	43-HDSL2-L1	83
Wh/Br – Br/Wh	7 – 8	29 – 4	4-HDSL2-L1	4	24-HDSL2-L1	44	44-HDSL2-L1	84
Wh/Sl – Sl/Wh	9 – 10	30 – 5	5-HDSL2-L1	5	25-HDSL2-L1	45	45-HDSL2-L1	85
Rd/Bl – Bl/Rd	11 – 12	31 – 6	6-HDSL2-L1	6	26-HDSL2-L1	46	46-HDSL2-L1	86
Rd/Or – Or/Rd	13 – 14	32 – 7	7-HDSL2-L1	7	27-HDSL2-L1	47	47-HDSL2-L1	87
Rd/Gr – Gr/Rd	15 – 16	33 – 8	8-HDSL2-L1	8	28-HDSL2-L1	48	48-HDSL2-L1	88
Rd/Br – Br/Rd	17 – 18	34 – 9	9-HDSL2-L1	9	29-HDSL2-L1	49	49-HDSL2-L1	89
Rd/Sl – Sl/Rd	19 – 20	35 – 10	10-HDSL2-L1	10	30-HDSL2-L1	50	50-HDSL2-L1	90
Bk/Bl – Bl/Bk	21 – 22	36 – 11	11-HDSL2-L1	11	31-HDSL2-L1	51	51-HDSL2-L1	91
Bk/Or – Or/Bk	23 – 24	37 – 12	12-HDSL2-L1	12	32-HDSL2-L1	52	52-HDSL2-L1	92
Bk/Gr – Gr/Bk	25 – 26	38 – 13	13-HDSL2-L1	13	33-HDSL2-L1	53	53-HDSL2-L1	93
Bk/Br – Br/Bk	27 – 28	39 – 14	14-HDSL2-L1	14	34-HDSL2-L1	54	54-HDSL2-L1	94
Bk/Sl – Sl/Bk	29 – 30	40 – 15	15-HDSL2-L1	15	35-HDSL2-L1	55	55-HDSL2-L1	95
Yl/Bl – Bl/Yl	31 – 32	41 – 16	16-HDSL2-L1	16	36-HDSL2-L1	56	56-HDSL2-L1	96
Yl/Or – Or/Yl	33 – 34	42 – 17	17-HDSL2-L1	17	37-HDSL2-L1	57	N/C	97
Yl/Gr – Gr/Yl	35 – 36	43 – 18	18-HDSL2-L1	18	38-HDSL2-L1	58	N/C	98
Yl/Br – Br/Yl	37 – 38	44 – 19	19-HDSL2-L1	19	39-HDSL2-L1	59	N/C	99
Yl/Sl – Sl/Yl	39 – 40	45 – 20	20-HDSL2-L1	20	40-HDSL2-L1	60	N/C	100
Vi/Bl – Bl/Vi	41 – 42	46 – 21	Spares Tied Off					
Vi/Or – Or/Vi	43 – 44	47 – 22						
Vi/Gr – Gr/Vi	45 – 46	48 – 23						
Vi/Br – Br/Vi	47 – 48	49 – 24						
Vi/Sl	49	50						
Sl/Vi	N/C	N/C						
Drain Wire	50	25	Frameground					

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