C A U T I O N !
SUBJECT TO ELECTROSTATIC DAMAGE
OR DECREASE IN RELIABILITY.
HANDLING PRECAUTIONS REQUIRED.

MODEL ADTRAN D448 U-BR1TE
ISDN 2B1Q INTERFACE
INSTALLATION/MAINTENANCE

CONTENTS

1. GENERAL

This practice provides installation and maintenance information for the ADTRAN D448 U-BR1TE. Figure 1 is a drawing of the unit identifying pertinent switches and indicators.

The D448 U-BR1TE is a line card designed to operate with the Alcatel D448 PCM Trunk Carrier System or the D424 Digital Multiplexer System. The U-BR1TE provides an ISDN U-interface allowing transportation of Basic Rate ISDN (2B+D) over T1 carriers. This allows ISDN service to be extended beyond the normal servicing range (18 kft) of an ISDN ready switch. The D448 U-BR1TE may be used in the Central Office Terminal (COT) location and in the Remote Terminal (RT) location. Clear channel capability is not required of the T1 facility if zero code substitution is enabled. The D448 U-BR1TE plugs into a single physical slot but requires up to three consecutive time slots when configured for 2B+D. Block error rate (BER) performance over the T1 facility is monitored and available to the network.

The ADTRAN D448 U-BR1TE is interchangeable with the Alcatel D448 ISDN Basic Rate Access Channel Unit,
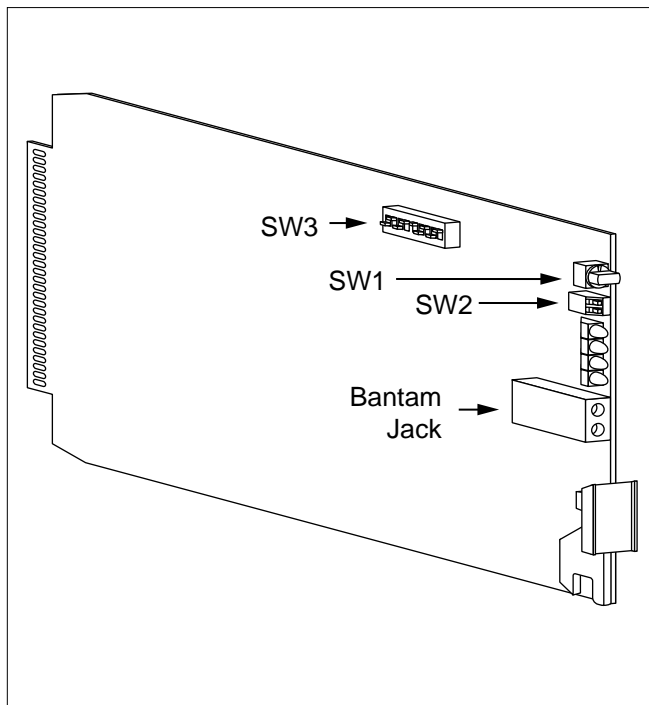
Figure 1. D448 U-BR1TE

Part Number 628402. Features of the D448 U-BR1TE, part number 1430020L1, include:

*   ISDN 2B1Q interface meets all Layer 1 requirements as specified in ANSI T1.601-1992.
*   Transports ISDN Basic Rate 2B+D information over T1 facilities in the 3-DS0 format specified in TR-NWT-000397.
*   18 kft nominal range on mixed gauge wire (42 dB @ 40 kHz loop loss, 1300 Ω DC resistance design).
*   Respond to all Layer 1 maintenance functions.
*   Performance monitoring of the Layer 1 facility as specified in TR-NWT-000397.
*   Distinctive metallic DC test signature to identify either line unit LT or line unit NT mode of operation.
*   B1 and B2 addressability at the faceplate for a local loopback, the NT1, and up to six devices in the network-to-customer direction.
*   DS0 logic level transmit and receive data access through faceplate bantam jacks.

The D448 U-BR1TE unit has two interfaces. The loop-side interface is an ISDN U-interface that transmits and receives data simultaneously, full-duplex over a standard 2-wire, unloaded loop for a distance up to 18 kft of mixed gauge wire. The D448 U-BR1TE can be configured for Adjacent-to-Switch, Adjacent-to-Customer, Tandem Office, and U-Repeater modes of operation. See Figure 2 for circuit location description. The carrier side interface provides mapping of the 2B+D and DSL overhead to up to three DS0s of the 1.544 Mbps T1 stream. Indicators for the loop and carrier synchronization status are located on the faceplate. See Table B for a description of each indicator. Connection to the U-Interface is made to Tip/Ring of the physical shelf slot position in which the U-BR1TE is installed.

2. INSTALLATION

After unpacking the unit, immediately inspect it for possible shipping damage. If damage is discovered, file a claim immediately with the carrier, then contact ADTRAN Customer Service, RMA; (subsection 5).

The ADTRAN D448 U-BR1TE plugs into a single shelf slot position of an Alcatel D448 or D424 T1 carrier system and requires no special wiring. Connection to the U-interface is made to Tip/Ring of the physical shelf slot position when the U-BR1TE is installed. The type of service selected can affect the adjacent shelf slots. When configured for 2B+D mode of operation, which is the most typical application, three timeslots are required. The timeslots used are the first slot position the D448 U-BR1TE is installed in, and the next two adjacent shelf slot positions, which must be empty. In the 2B+D mode of operation, the D448 U-BR1TE cannot be located in J23 or J24. In 1B+D or 2B modes of operation, only one adjacent shelf slot position is required, of which J24 cannot be used. In 1B and D modes of operation, only the physical time slot of the shelf slot position is required, and there are no restrictions.

When the D448 U-BR1TE is deployed in a CO terminal, located at the same facility as the ISDN servicing switch, or in a Tandem Office configuration, the D448 or D424
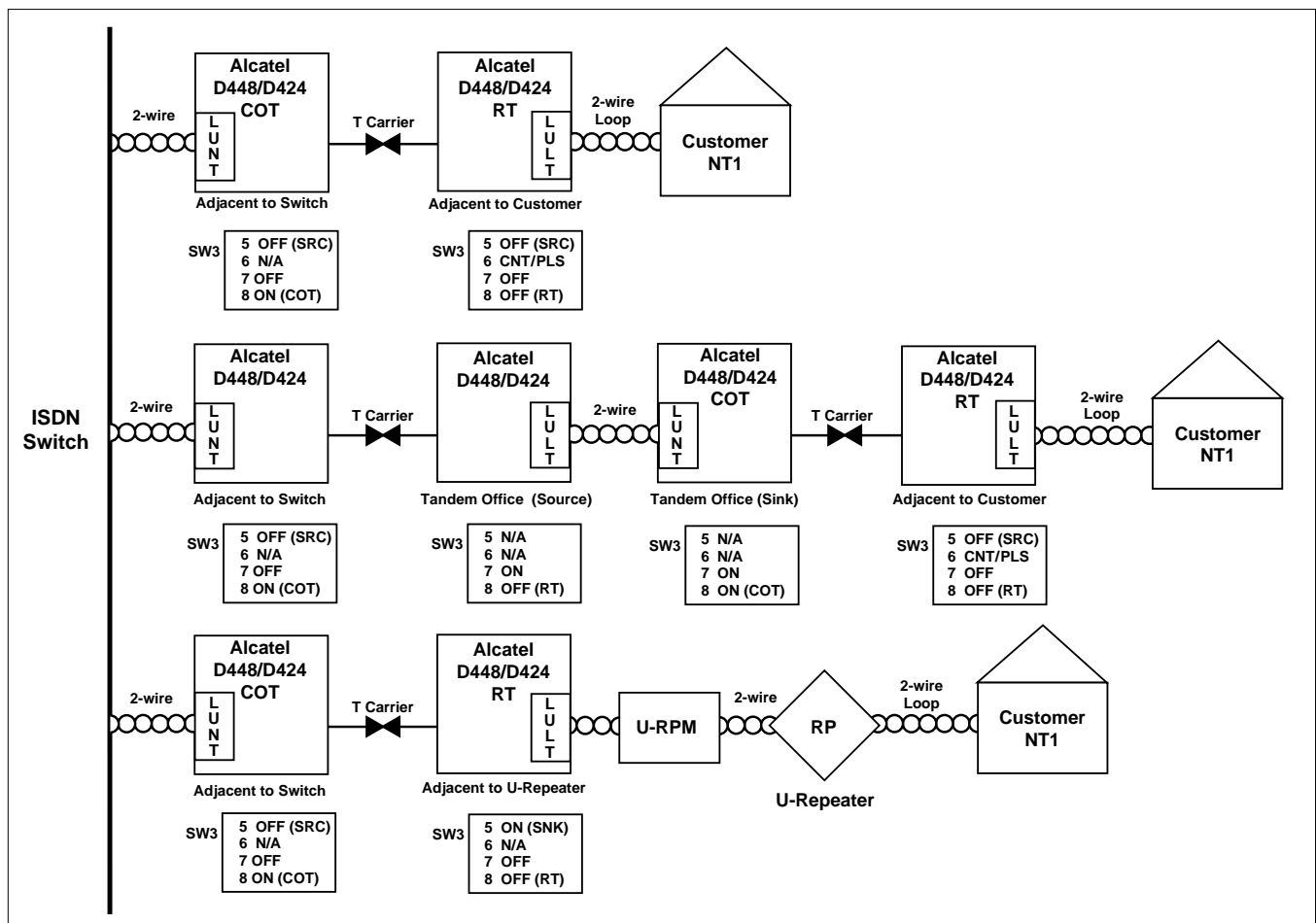

Figure 2. Typical ISDN Circuit with Associated Switch Option Settings

channel banks must be provisioned for external timing. The external timing from a suitable composite clock must have Stratum One traceability. When deployed in a remote terminal (Adjacent-to-Customer), the timing for that channel bank may be either loop timed (LP) or from an external timing source. Consult local provisioning documents for timing options.

3. CONFIGURATION

There are several settings on SW3 that must be selected before installing the D448 U-BR1TE. Figure 1 identifies the location of SW3. Figure 3 identifies the available switch settings. Table A describes the switch function for determining the appropriate switch positions.
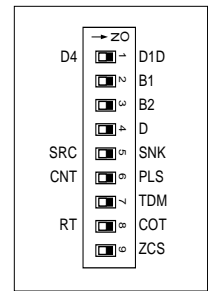
Figure 3. SW3

Table A. Internal Switch Option Settings

Switch	Label	Function	Description
SW3-1 On (D1D) Off (D4)	D4/D1D	Sets time slot counting sequence Selects D1D counting mode Selects D4 counting mode	Switch setting must be set according to the configuration of the channel bank.
SW3-2 SW3-3 SW3-4	B1 B2 D	Service Level	Service SW3-2 SW3-3 SW3-4 2B+D On On On 2B On On Off B1+D On Off On B2+D Off On On B1 On Off Off B2 Off On Off D Off Off On
SW3-5 On (SNK) Off (SRC)	SRC or SNK	If SW3-8 is On (COT) Terminates sealing current Does not terminate sealing current	In the Adjacent-to-Switch (COT) mode, this option allows the unit to terminate sealing current from the ISDN switch. The recommended setting is Off and is not applicable when SW3-7 is On (TDM).
On (SNK) Off (SRC)		If SW3-8 is Off (RT) Does not provide sealing current Provides sealing current to NT1	In the Adjacent-to-Customer (RT) mode, this option allows the unit to provide either Constant or Pulsed sealing current to the customer NT1. Recommended setting is Off. This switch is not applicable when SW3-7 is On (TDM).
SW3-6 On (PLS) Off (CNT)	CNT or PLS	Sealing current mode Selects pulsed sealing current Selects constant sealing current	This switch only applies when SW3-5 is Off (SRC) and SW3-7 is Off. The unit provides 20 mA constant sealing current when set to Off (CNT). When set to On (PLS), the unit provides 3 mA constant sealing current with one 20 mA pulse lasting 3 milliseconds every 24 hours.
SW3-7 On (TDM) Off	TDM	Tandem mode Enables tandem mode of operation Disables tandem mode	Allows for tandem or adjacent modes of operation (Figure 2) used in conjunction with SW3-8 (COT/RT). When On (TDM), SW3-5 and 6 are not applicable.
SW3-8 On (COT) Off (RT)	COT or RT	Termination mode COT mode selected RT mode selected	This switch should be On when installed in a COT - Adjacent-to-Switch or Tandem Office (Sink) applications. Switch should be Off when installed in an RT - Adjacent-to-Customer, Tandem Office (Sink) or Adjacent to ADTRAN U-Repeater.
SW3-9 On (ZCS) Off	ZCS	Zero code substitution Enables ZCS Disables ZCS	The ZCS option must be the same for the COT and RT. The switch setting should be On for AMI-provisioned circuits. The switch setting is optional for B8ZS-provisioned circuits. Consult local provisioning documents.

4. TESTING

In case of equipment malfunction, use of the testing capability of the ISDN switch or local test access using the D448 U-BR1TE faceplate can aid in sectionalizing the location of a network fault.

Faceplate indicators display the various conditions occurring with respect to the D448 U-BR1TE. Table B lists each indicator and its error message.

Table B. Faceplate LED Indicators

Indicator	Color	Description
CRS	Red	(Carrier Sync) No framing pattern (TR-TSY-000397 compliant) is received.
LPS	Red	(Loop Sync) U-interface is out of sync or has a loss of signal.
ACT	Green	(Activation) Synchronization is achieved from the ISDN switch to the NT1.
RLB	Yellow	(Remote Loopback) Responding to a loopback request from an upstream unit.
	Green	A downstream unit has responded to a loopback request.

The ADTRAN D448 U-BR1TE responds to the B1, B2, and 2B+D loopbacks as specified in TR-NWT-000397. Loopback on a single B channel will not interrupt either of the other channels. The 2B+D loopback is service affecting for the customer.

Loopbacks in the network-to-customer direction can be initiated from the faceplate of the D448 U-BR1TE. Faceplate initiated loopbacks are non-obtrusive to unused channels.

To test the D448 U-BR1TE:

A. Connect the DS0 tester configured for Near Logic to the Bantam jack (RX/TX). See Figures 1 and 4 for location identification.

B. Using the rotary Address Select knob (SW1), select the desired address of the downstream unit to be tested. See Table C for address information.

Table C. Address Select Knob Positions

Switch Position	Interpretation
0	NT1
1	Local Loopback
2	1st unit downstream
3	2nd unit downstream
4	3rd unit downstream
5	4th unit downstream
6	5th unit downstream
7	6th unit downstream

C. Select the appropriate bearer channel using the B1/B2 DIP switch (SW2-1).

D. To activate the loopback test, place SW2-1 to TEST.

E. Upon completion of the test, select another address using the rotary Address Select knob and/or another B channel using SW2-2.

F. When all testing is complete, place SW2-1 to NORM and remove the DS0 tester from the Bantam jack.
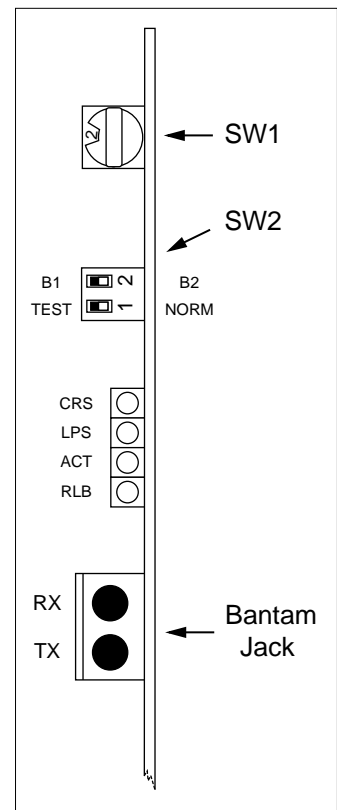
Figure 4. Front View

5. WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within five years from the date of shipment, if the product does not meet its published specifications or if it fails while in service. For detailed warranty, repair, and return information, refer to the ADTRAN Equipment Warranty and Return Policy and Procedure.

Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN. ADTRAN does not recommend that repairs be performed in the field.

For service, RMA requests, or further information, contact one of the following numbers:

ADTRAN Customer Service:
RMA (Repair Service)   (205) 971-8722
Technical Support (Post-Sales)   (800) 726-8663
Applications Engineering
(Pre-Sales Support and Inquiries) (800) 615-1176
Sales   (800) 827-0807

Repair and Return Address:
ADTRAN, Inc.
Customer Service Department
P. O. Box 070020
901 Explorer Boulevard
Huntsville, Alabama 35807

Table D. Specifications

Input/Output Signal	

Line:	2-wire (Tip and Ring)
Operating Mode:	Full-duplex
Data rate:	160 kbps total; 144 kbps available to customer
Signal Format:	2B1Q

Faceplate Indicators	

Controls:	B1/B2	Bearer channel select switch
	NORM/TEST	Normal operation/activates selected loopback
	8-position rotary switch	Select loopback addresses, loop or carrier direction
Indicators:	LPS (Loop Sync)	Red U-interface is out of sync.
	CRS (Carrier Sync)	Red No Framing pattern being received
	ACT (Active)	Green Traffic is being passed in both directions
	RLB (Remote Loopback)	Green Downstream unit has responded to loopback request
		Yellow Responding to a loopback request from an upstream unit

Output Amplitude	

2.5 Volt, zero-to-peak	
TX source impedance:	Per ANSI T1.601-1992
RX source impedance:	Per ANSI T1.601-1992
Receiver Sensitivity:	Per ANSI T1.601-1992

Power	

Voltage:	5 VDC	12 VDC	-48 VDC
Current:	85 mA	7 mA	27 mA
On card dissipation:	1.8 W maximum		

Sealing Current	

Constant:	20 mA constant
Pulsed:	3 mA constant with one 20 mA (3 ms duration) pulse every 24 hours

Dimensions	

Size:	5.8"H, 0.06"W, 9.45"D
Weight:	8 oz
Mounting:	Mounts in Alcatel D448 or D424 channel banks

Operating Environment	

Temperature:	Operating: 0˚to 55˚ C (32˚ to 131˚ F)
	Storage: -40 to 85˚C (-40˚ to 85˚F)
Humidity:	To 95%, no condensation

Miscellaneous	

Fully compatible with the Alcatel D448 and D424 channel bank equipment.
Interface is compatible with ISDN and other digital services, according to TR-NWT-000397.

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