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

Section 61100020L1-5
Issue 6, July 1992
CLEI Code #D4CIAB52__

365-170-502

MODEL U-BR1TE
ISDN 2B1Q INTERFACE
INSTALLATION/MAINTENANCE

Contents

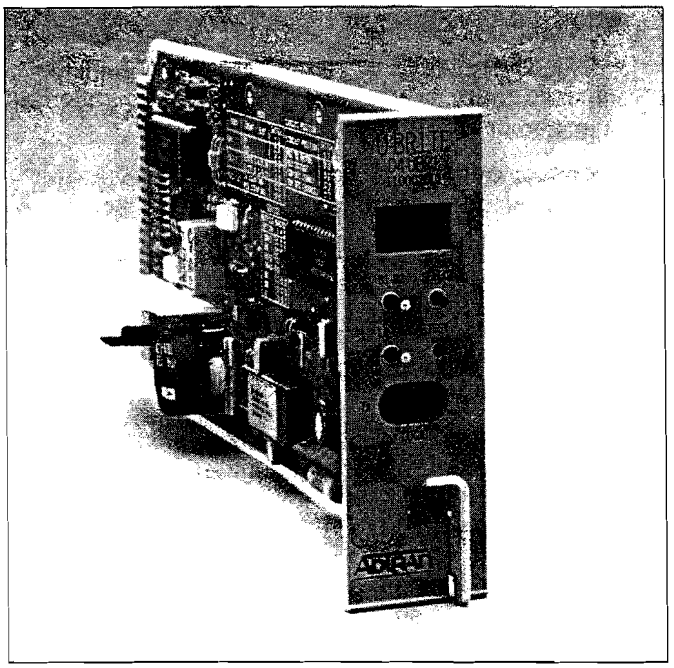


FIGURE 1. U-BR1TE Front View

1. GENERAL

1.01 This section provides installation and maintenance information for the ADTRAN U-BR1TE. **Figure 1** is a frontal, three-dimensional view of the unit. The part number and basic features for the U-BR1TE are provided in **Table A**.

TABLE A. ADTRAN U-BR1TE Features

Unit	Part No.	Features
U-BR1TE	1100020L1	Basic rate 2B+D service, faceplate Bantam jacks, 18,000 ft. range, 4-character faceplate display, NT or LT operational modes, local and remote loopback.

1.02 This practice has been reissued for text correction and the addition of graphics. Issue 2 provided corrections to Switchbank 1, Tandem Office position settings. Issue 3 provides additional information concerning start-up configuration, testing features, latest CLEI designation and **Figure 2**, **Figure 4**, **Table A**, and **Table B**. Issue 4 added the new Sales telephone number and Issue 5 added Far End Open to **Table C**.

1.03 The ADTRAN U-BR1TE is a line card for use in AT&T D4/SLC-96 channel banks. The U-BR1TE provides and ISDN U-interface and allows the transport of Basic Rate 2B+D information over T1 carriers. The U-BR1TE may be used at both the Central Office Terminal (COT) location and the Remote Terminal (RT) location. Clear Channel capability (B8ZS) is not required of the T1 facility if Zero Byte Suppression is enabled. The U-BR1TE plugs into a single channel slot of the D4 bank. Three time slots are required for transport of 2B+D information. Block error rate performance over the T1 facility is monitored and is available to the network.

1.04 The ADTRAN U-BR1TE provides a means to provide Basic Rate (2B+D) ISDN service to remote locations over existing single twisted pair wiring. The ADTRAN U-BR1TE contains the following features:

a. ISDN U-interface which meets all layer 1 requirements as specified in ANSI T1.601-1991.

b. 18,000 feet nominal range on the U-interface using mixed gauge wire.

c. Transports ISDN Basic Rate 2B+D information over T1 facilities in the 3 DS0 format specified in TR-NWT-000397.

d. Performance monitoring of the T1 facility as specified in TR-NWT-000397.

e. All layer 1 maintenance functions.

f. Loopback capability of full 2B+D and individual B channels in both loop and carrier directions. Loopbacks may be initiated at the U-BR1TE faceplate or from a remote location via the maintenance channel.

g. Interim Path or Interim Segmented performance monitoring as specified in TR-NWT-000397 requirements for multipoint *eoc* intermediate slave node.

h. A distinctive metallic DC test signature to identify either line unit LT or line unit NT mode of operation as specified in TR-NWT-000397.

i. Loopback addressability at faceplate, of up to four devices in the network-to-customer direction.

j. DS0 logic level transmit and receive data access through faceplate Bantam jacks.

k. A built-in *crc* block error detector to allow for local performance monitoring at the faceplate, without test equipment.

l. Addressing, test function and error status on a faceplate four-character alphanumeric display.

2. INSTALLATION

2.01 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.

2.02 The U-BR1TE plugs into a single D4/SLC-96 channel slot. When provisioned to provide basic rate service (2B+D), the U-BR1TE occupies three time slots. In a D4 or SLC-96 Mode 3 channel bank, it occupies the time slot associated with the physical channel slot that it occupies and the next two time slots to the right. The physical channel slots whose time slots are used in this manner must remain unoccupied.

In a SLC-96 Mode 1 with D1D counting channel bank, the time slots are allocated as shown in **Figure 2** with two time slots per physical channel slot.

The unit uses two time slots in one physical slot and a time slot from an adjacent slot when configured for 2B+D operation. When optioned for Slot 1, 4, 7, 10 operation, the unit occupies the two time slots associated with the physical slot in which it resides and the upper time slot of the next adjacent physical slot. When optioned for Slot 2, 5, 8, 11 operation the unit occupies the lower time slot of the occupied physical slot and the adjacent two time slots of the next physical slot to the right. When using the Slot 2, 5, 8, 11 option, the physical slot to the right must be left vacant. A unit optioned for two time slots (B1+D or B2+D) occupies only the two time slots associated with the physical slot used. In this configuration, option the unit for Slot 1, 4, 7, 10. See **Table B** for additional channel slot deployment restrictions for each bank type.

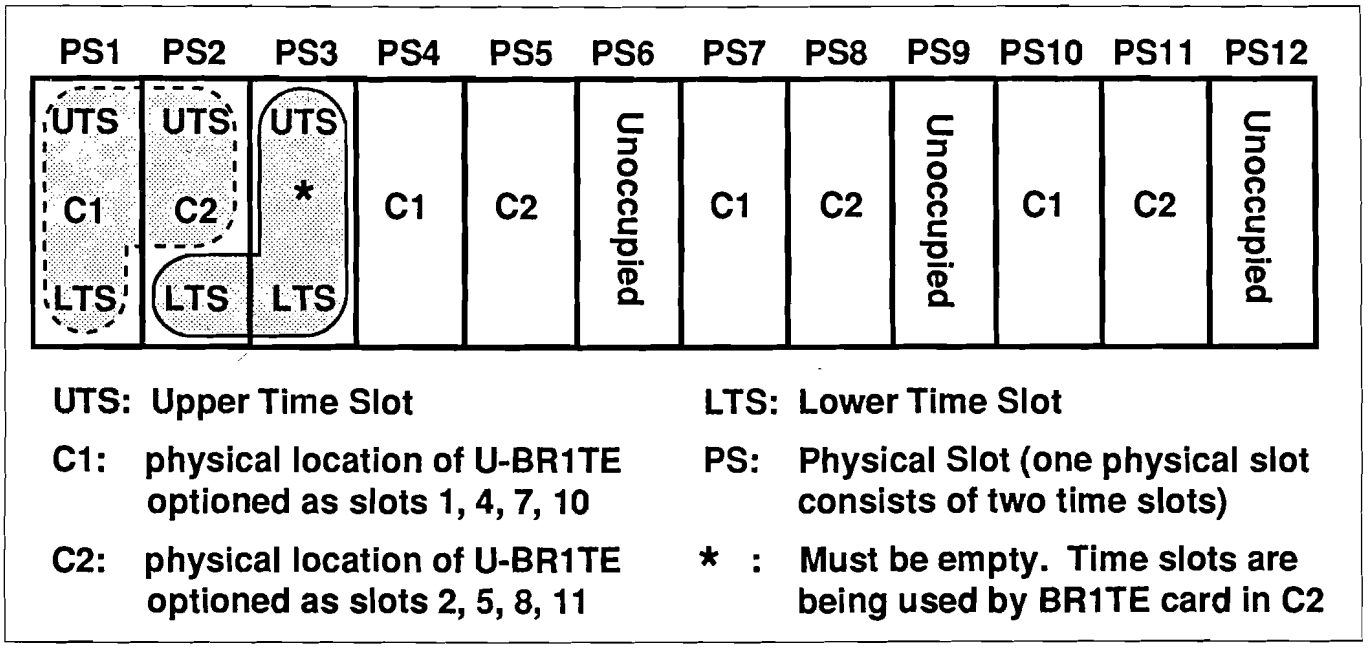
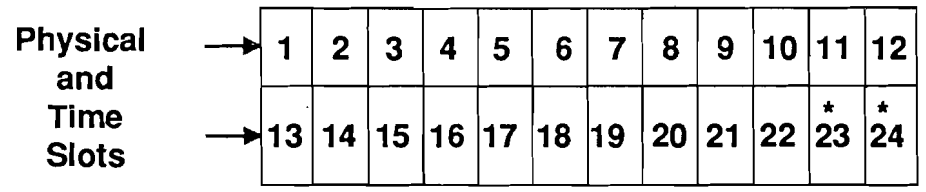


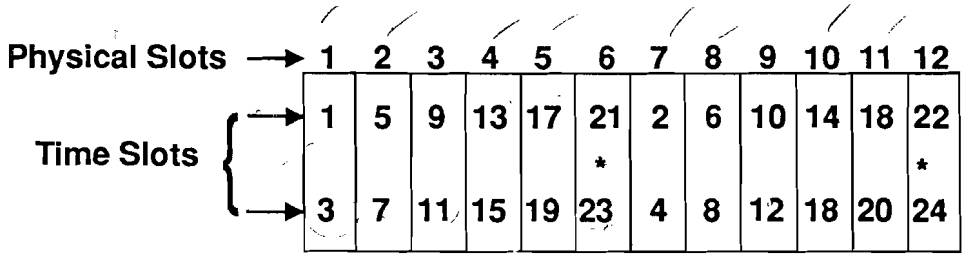
FIGURE 2. Time Slot Assignments for 2B+D Service in SLC Mode 1 with D1D Counting

TABLE B. Channel Slots that Cannot Contain BR1TE Cards

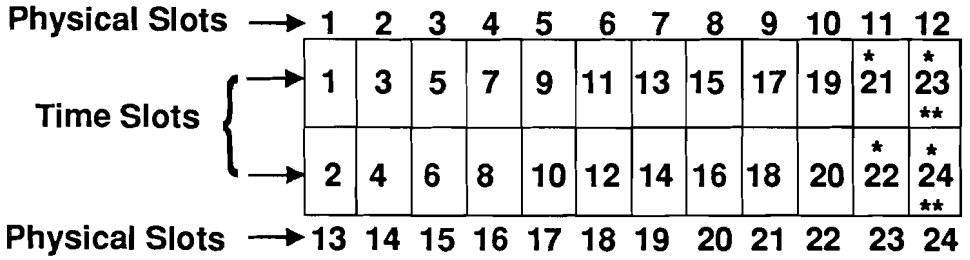
Type of Service	D4 Bank with D4 Counting	SLC-96 Mode 1 with D1D Counting	SLC-96 Mode 3 with D1D Counting	D4 Bank with D1D Counting or SLC-96 Mode 3 with D4 Counting
D	---	---	---	---
B1+D or B2+D	24	---	6, 12, 18, 24	12, 24
2B+D	23, 24	6, 12	6, 5, 11, 12, 18, 18 23, 24	11, 12, 23, 24



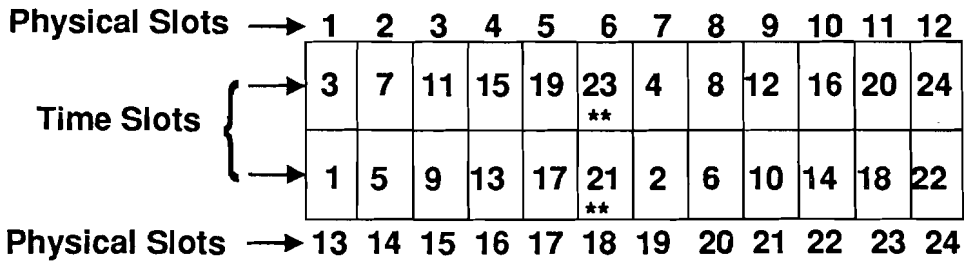
D4 Bank - D4 Channel Counting



SLC-96 Carrier Mode I Terminal - D1D Channel Counting



D4 Bank - D1D Channel Counting and
SLC-96 Carrier Mode III Terminal - D4 Channel Counting



SLC 96 Carrier Mode III Terminal - D1D Channel Counting

* A channel unit with 2B+D service cannot occupy this slot.
** A channel unit with B+D service cannot occupy this slot.

PHYSICAL REQUIREMENTS

2.03 The U-BR1TE occupies one card position in the D4 channel bank. The connector pin assignments are illustrated in **Figure 3**.

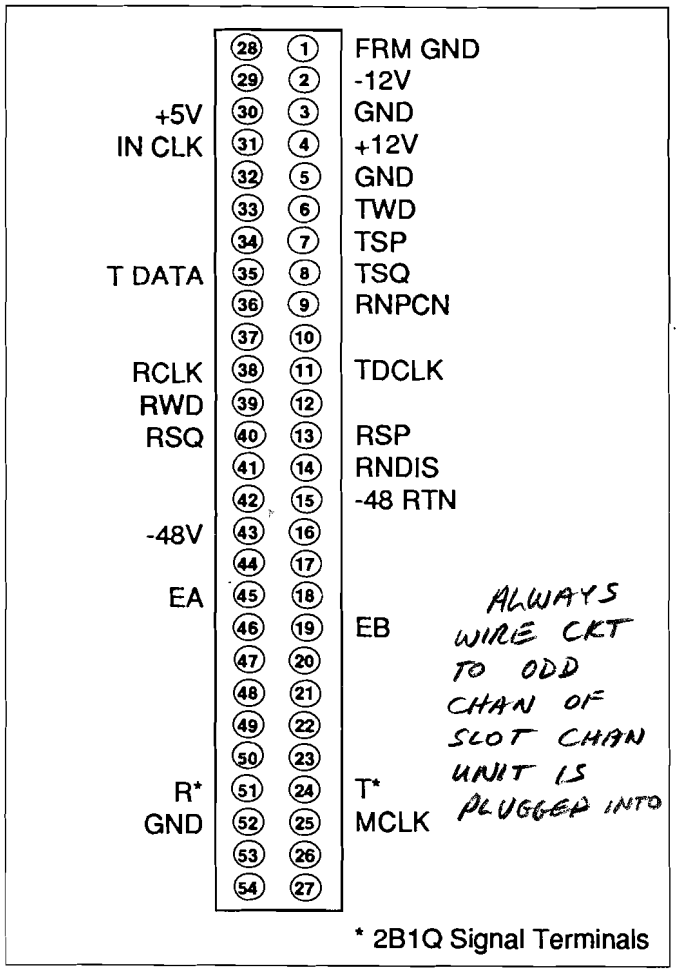


FIGURE 3. Connector Pin Assignments

INTERFACE REQUIREMENTS

2.04 The U-BR1TE unit includes two interfaces. The loop side interface is an ISDN U-interface which is used to deliver Basic Rate service. The carrier side interface is a D4/SLC-96 channel bank interface which is used to insert data into the 1.544 MB/s T1 stream. Only the polarity-insensitive T and R leads are used in the cross-connection.

INTERNAL OPTIONS

2.05 Switch Option Settings:
See **Figure 4** for SW1 location

2.05.1 The location and options for SW1 are described in this paragraph.

Mode Switches

Switch 1 and Switch 2: Select type of bank for U-BR1TE.

Bank	Count/Slot	Switch 1	Switch 2
D4	D4 Counting (factory default)	C	O
	D1D Counting	C	C
SLC 1	CU in slots 1, 4, 7, 10	C	C
	CU in slots 2, 5, 8, 11	O	O
SLC III	D4 Counting	C	C
	D1D Counting	O	O

Note: The ADTRAN U-BR1TE supports the following bank and counting types:
D4 with D4 and D1D counting
SLC Mode I D1D counting, only
SLC Mode III D4 and D1D counting

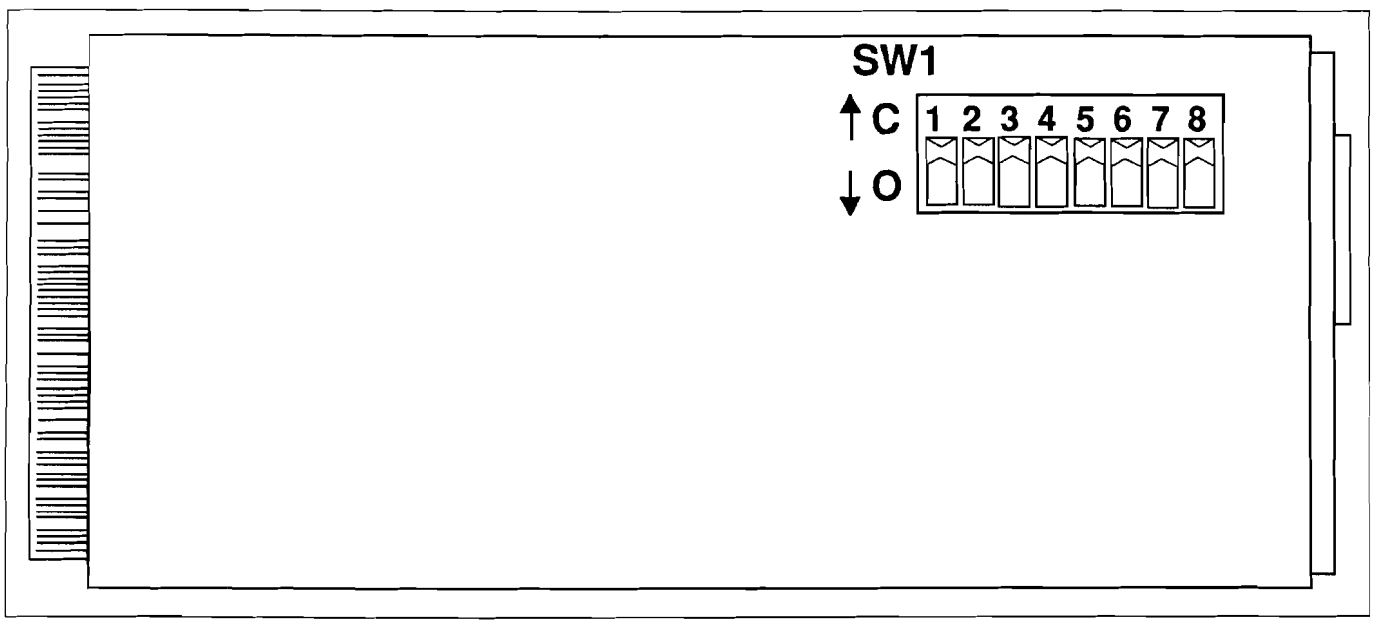


FIGURE 4. U-BR1TE SW1

Service Switches

Switch 3, Switch 4, and Switch 5: Select the level of service. The U-BR1TE may be optioned to deliver full ISDN (2B+D) or any intermediate level of service. Closing the appropriately labeled switch enables that channel.

Service Option	Switch		
	3	4	5
2B+D (factory default)	C	C	C
2B	C	C	O
B1+D	C	O	C
B2+D	O	C	C
B1	C	O	O
B2	O	C	O
D	O	O	C

Position Switches

Switch 6 and Switch 7: Determine where the U-BR1TE is to operate. The four possible network positions are listed below (also, see **Figure 6**).

Position In Circuit	Switch	
	6	7
Adjacent to Switch	O	O
Adjacent to Customer	O	C
Tandem Office Switch Side (Source)*	C	C
Tandem Office Customer side (Sink)	C	O

* **The U-BR1TE must be optioned for this position if an ADTRAN U-Repeater is used to extend the range of the circuit.**

ZBS Switch

Switch 8: Enables or disables Zero Byte Suppression. ZBS should be selected On when the carrier is AMI and should be selected Off when the carrier is B8ZS.

Option	Carrier Mode	SW8 Position
ZBS On	AMI	O
ZBS Off	B8ZS	C

FACEPLATE FEATURES

2.06 **Figure 5** is an illustration of the ADTRAN U-BR1TE faceplate. The B1-B2 switch determines which bearer channel (B1 or B2) is to be looped back. If only one bearer channel has been selected, the switch must select the configured channel. The LP-CR (Loop Carrier) switch determines the direction of the loopback. Loopback addresses may only be selected in a downstream direction from the ISDN switch (see **Figure 6**). The SELECT button is sued to determine the loopback location or specific tests as indicated on the four-character LED display. See **Table C** for a list of the possible options using the SELECT button. The TEST button, which activates U-BR1TE test features, is recessed to prevent inadvertent operation.

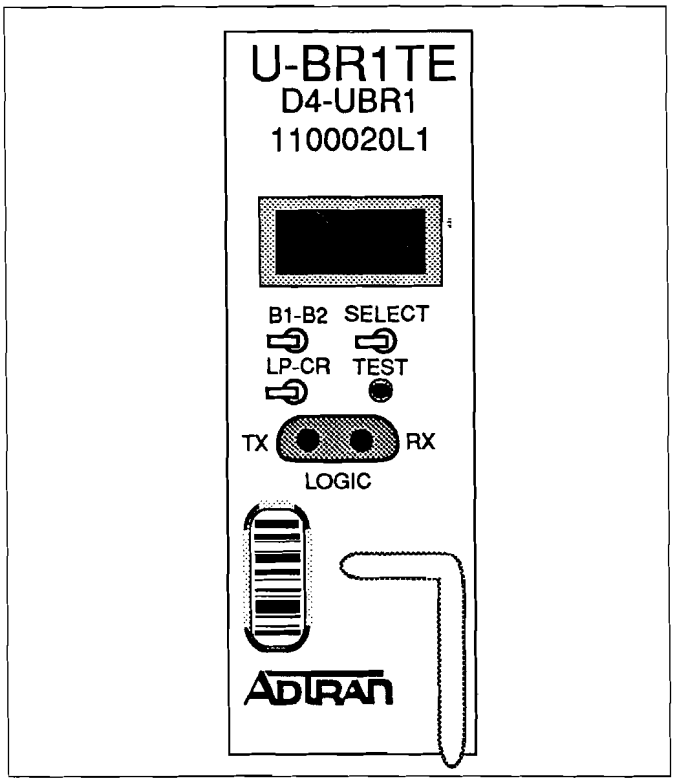


FIGURE 5. U-BR1TE Faceplate

TABLE C. Select Switch Address Options

Display	Interpretation
ADR1	Address #1, this unit's own address
ADR2	Address #2, the next downstream unit away
ADR3	Address #3, the third unit away
ADR4	Address #4, the fourth unit away
NT1	NT1, the NT1's address
LPBK	Loopback, forces this unit to loopback either B1-B2 from the front panel. Loopbacks occur in both the customer and network directions.
XMIT	Transmit, forces this unit to inject a data pattern into either B1-B2 in either loop or carrier direction through the front panel Bantam jack from a BERT test set.
NEBE	Near End Block Error
FEBE	Far End Block Error
TOTL	Total (NEBE + FEBE)

D4 BANK REQUIREMENTS

2.07 The COT D4 bank must be configured with an OIU-2 optioned for external timing. The COT bank must be provided with an external composite clock synchronized with the network.

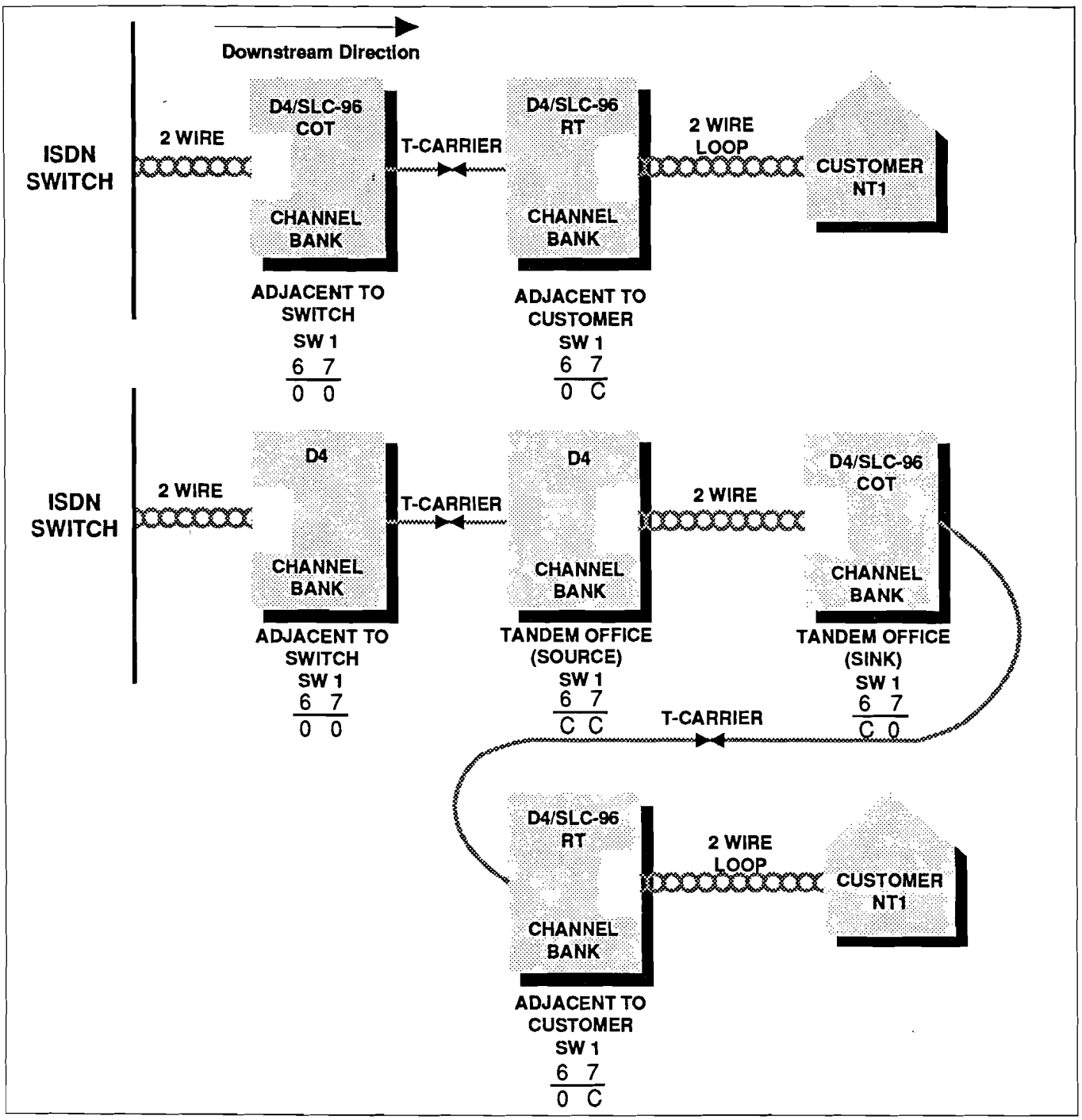


FIGURE 6. Position Switch Settings at Network Locations

SLC BANK REQUIREMENTS

2.08 The COT SLC bank must be configured with an Special Services Unit (SSU) optioned for external timing. The COT SLC bank must be provided with an external composite clock synchronized with the network.

Note: ***Please verify SLC TRU card for counting option. The TRU Mode I card has an option for D1D or D4 counting. The U-BR1TE only supports D1D counting in SLC Mode I.***

3. TESTING

3.01 In case of equipment malfunction, use the testing capability of the ISDN switch or the U-BR1TE faceplate connector with digital test set (e.g., TPI 108/109 RT II, FIREBERD 6000, etc.) or equivalent digital test sets. The faceplate has Bantam jacks for manual testing.

Note: ***When a U-BR1TE is performing a loopback the loopback occurs internal to the U-interface transceiver.***

3.02 Loopback Tests

Loopbacks in the network-to-customer direction can be initiated from either the ISDN switch or the faceplate. A loopback in the customer-to-network direction can be made from the faceplate only if another ADTRAN ISDN product is closer to the network. A DS0 digital test set can be used to inject the required 64 kB/s bit pattern into a chosen B channel. The test set must be configured as Near Logic. The SELECT push-button displays the addresses available for loopback in a chose direction. The options are shown in **Table C**. To initiate a loopback, perform the following:

1. Insert BERT tester probes into front panel Bantam jacks (configure test set as NEAR LOGIC). Place the transmitting Bantam plug into Tx and the receiving Bantam plug into Rx of the faceplate.
2. Select desired test direction either loop or carrier, using LP-CR toggle switch.
3. Select desired bearer channel using B1-B2 toggle switch.
4. Select loopback address using SELECT push-button.
5. Press the recessed TEST push-button to initiate loopback.
6. To deactivate loopback press recessed TEST push-button or remove transmit test probe.

The flashing message **ADR# LOOP BACK** indicates that the addressed element is in loopback. If the element is unable to loopback or is not present, the message **LOOP BACK FAIL** will be displayed. The message **CHCK TEST SET** indicates either the BERT test set transmit probe is not properly installed in the faceplate Bantam Tx jack or is not configured as NEAR LOGIC. A list of the messages generated by the LED display is described in **Table D**. To conduct a straight-away (point-to-point) test, follow this procedure:

1. Insert the BERT tester probes into front panel Bantam jacks (configure test set as NEAR LOGIC). Place the transmitting Bantam plug into Tx and the receiving Bantam into Rx or the faceplate.
2. Select desired test direction, either loop or carrier, using LP-CR toggle switch.
3. Select desired bearer channel using B1-B2 toggle switch.
4. Select XMIT using the SELECT push-button.
5. Press the recessed TEST push-button to initiate transmitting BERT pattern into the selected bearer channel through the faceplate Tx plug. The unit should display **XMIT LP** (or **CR**) **SIDE**.
6. On the far-end unit, perform Steps 1 through 5, choosing the exact same faceplate switch settings. Ensure that both BERT testers are using the same identical test pattern (511, 2047, etc.).

TABLE D. LED Display Messages

Display	Interpretation
ACTV IN PROG	Activation in progress, the 2-Wire loop is attempting to activate.
LOOP IS DOWN	The 2-Wire loop is not activated, the 2-Wire loop may not be terminated.
ADR# LOOP BACK	A distant unit with address # is in a loopback commanded from this card.
NT1 LOOP BACK	The NT1 is in loopback as commanded from this card.
B1 LOOP BACK	This card is currently looping back channel B1 as commanded from a far unit.
B2 LOOP BACK	This card is currently looping back channel B2 as commanded from a far unit.
2B+D LOOP BACK	This card is currently looping back all channels as commanded from a far unit.
BANK CR FAIL	Bank carrier fail, the channel bank is not receiving data from the T-carrier.
XMIT CR SIDE	Transmit carrier side, forcing the injection of 64 kB/s data into a bearer channel from the front panel Bantam jack in the carrier direction.
XMIT LP SIDE	Transmit loop side, forcing the injection of 64 kB/s data into a bearer channel from the front panel Bantam jack into the loop direction.
MADE B1 LPBK	Made B1 loopback, manually forced the bearer channel B1 loopback in both the network and customer directions.
MADE B2 LPBK	Made B2 loopback, manually forced the bearer channel B2 loopback in both the network and customer directions.
CHCK TEST SET	Check test set, ensure test set Tx probe is properly inserted into faceplate Bantam jack and configured as NEAR LOGIC.
FAR END OPEN	The unit on the far end of the carrier is not present or not configured properly.

7. The UBR1TEs are now performing a straight-away test with each BERT tester receiving the other's transmitted test pattern.
8. To end the straight-away test press the recessed TEST push-button or remove transmit test probe.

To conduct an upstream loopback to another ADTRAN ISDN unit, follow these steps:

Downstream Unit (Unit Closer to Customer)

1. Insert the BERT tester probes into front panel Bantam jacks (configure tests set as NEAR LOGIC). Place the transmitting Bantam plug into Tx and the receiving Bantam plug into Rx of the faceplate.
2. Select upstream test direction, either loop or carrier, using LP-CR toggle witch.
3. Select desired bearer channel using B1-B2 toggle switch.
4. Select XMIT using the SELECT push-button.
5. Press the recessed TEST push-button to initiate transmitting BERT pattern into the selected bearer channel through the faceplate Tx plug. The unit should display **XMIT LP (or CR) SIDE.**

Upstream Unit (Unit Closer to Switch)

6. Select the same bearer channel as on downstream unit using B1-B2 toggle switch.
7. Select LPBK using the SELECT push-button. The unit will be placed in a bidirectional loopback, so the LP-CR switch setting is not applicable.
8. Press the recessed TEST push-button to force the unit into a loopback. The unit should display **MADE B1 (or B2) LPBCK.**
9. The U-BR1TEs are now performing an upstream loopback with the BERT tester at the downstream end inserting and receiving a test pattern.

Up and Down Stream Units

10. To end the upstream loopback on the downstream unit press the recessed TEST push-button or remove transmit test probe. On the upstream unit press the recessed TEST push-button.

Performance Monitoring of the local T1 carrier and 2-Wire loop can be performed from the front panel. To initiate local performance monitoring:

1. Do *not* insert a test probe into the Tx Bantam plug of the faceplate.
2. Select ADR1 with the SELECT push-button.
3. Select the direction to be monitored, either loop or carrier, using LP-CR toggle switch.
4. Press the recessed TEST push-button.
5. The total number of *crc* errors is displayed. Press the SELECT push-button again to read the Near End Block Error (NEBE) error count, press the SELECT button again to Far End Block Error (FEBE) count. This cycle can be repeated until the unit is brought out of this mode.
6. Press the TEST push-button a second time to exit the Local Performance Monitoring mode.

4. MAINTENANCE

4.01 The U-BR1TE requires no routine maintenance to operate properly. In case of equipment malfunction, use the faceplate test connector and indicators to determine the trouble source. The faceplate of the U-BR1TE contains Bantam test jacks for the TPI 108/109 RT II or equivalent digital test set adapter.

4.02 ADTRAN does not recommend that repairs be performed in the field. Repair services may be obtained by returning the defective unit to the ADTRAN Repair Department.

5. WARRANTY AND CUSTOMER SERVICE

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

5.02 Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN.

5.03 **For Sales or General Information, contact:**
ADTRAN Customer Service - Sales
(205) 722-8779

For Technical Support, contact:
ADTRAN Customer Service - Technical Support
~~(800) 722-8663~~ 800-726-8663

For RMA requests, contact: AMID
ADTRAN Customer Service - Repair Department
(205) 722-8722

Repair and Return Address:
ADTRAN, Inc.
Customer Service - Repair Department
4955 Corporate Drive
Huntsville, Alabama 35805

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