ADTRAN

PRACTICES

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

BR1/10 CENTRAL OFFICE BAYS
INSTALLATION/MAINTENANCE

CONTENTS

1. GENERAL

This practice provides installation and maintenance procedures for ADTRAN BR1/10 Central Office Bays. All bays include the 23-inch BR1/10 2X chassis. Figure 1 illustrates available configurations and Table 1 provides part numbers with various bay information (located on the following pages).

The ADTRAN BR1/10 bays are built in standard seven foot unequal flange relay racks (network-style bays are also available) with a fuse and alarm panel in each configuration. Depending on the number of chassis in the bay, one or two fuse panels are used. With the exception of the RL1 containing one chassis, the bays are constructed in groups of four chassis with a maximum of 20.

The bays are prewired for power and composite clock. The power connections for each chassis are wired to the fuse and alarm panel located at the top of each bay. The composite clock leads are daisy chained between chassis within their respective four-chassis grouping with a single connection provided for central office (CO) connection.

Features

- 400 U-interfaces available in seven foot rack compared to 64 with D4 channel banks

- Available in seven foot Unequal Flange and Network relay rack configurations with up to 20 BR1/10 channel banks (in groups of 4)

- Bay extenders available for nine foot and eleven foot six inch CO mountings

- All Bays include Dual Feed Fuse and Alarm Panel (located at top)

- Power feeds prewired from each bank to fuse panel

- Composite clock prewired

- Junction hardware, shim kit, and concrete floor anchors included

- Removable front and rear kick plates

- Front-mounted AC outlet opening

- Installation cables available for quick and efficient deployment

- Industry leading 10-year warranty
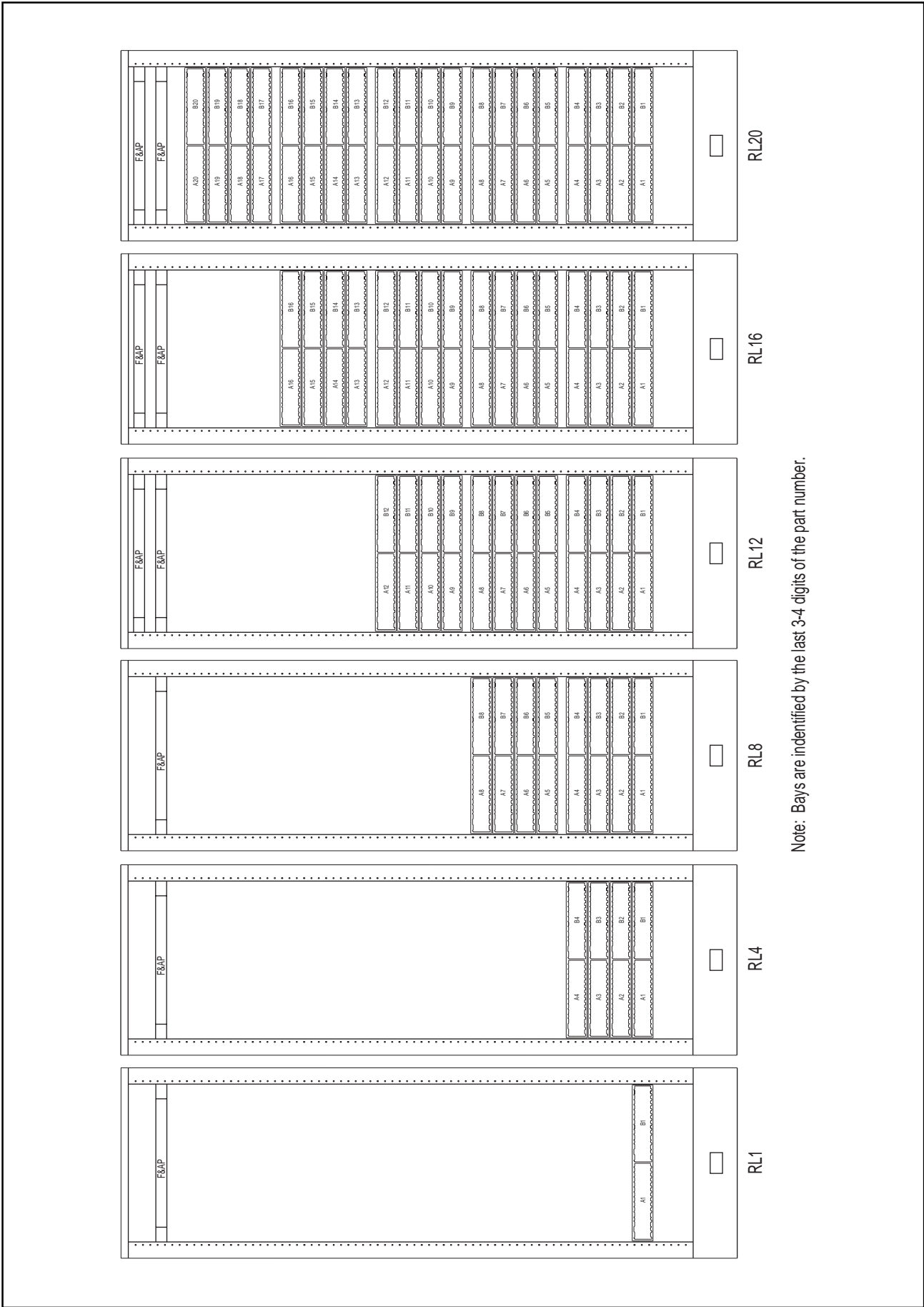
Note: Bays are indentified by the last 3-4 digits of the part number.

Figure 1. Front View of Bay Configurations

ADTRAN

Table 1. Bay Configurations

ADTRAN PART NUMBER	HEIGHT	NO. OF CHASSIS	RACK TYPE	COLOR	NO. OF FUSE PANELS
4150BR2x10RL1	7'	1	Unequal flange	Gray	1
4150BR2x10RL4	7'	4	Unequal flange	Gray	1
4150BR2x10RL8	7'	8	Unequal flange	Gray	1
4150BR2x10RL12	7'	12	Unequal flange	Gray	2
4150BR2x10RL16	7'	16	Unequal flange	Gray	2
4150BR2x10RL20	7'	20	Unequal flange	Gray	2
4150BR2x10RL1#N	7'	1	Network	Blue	1
4150BR2x10RL4#N	7'	4	Network	Blue	1
4150BR2x10RL8#N	7'	8	Network	Blue	1
4150BR2x10RL12#N	7'	12	Network	Blue	2
4150BR2x10RL16#N	7'	16	Network	Blue	2
4150BR2x10RL20#N	7'	20	Network	Blue	2
BAY EXTENDERS					
3353037	7'-9'	-	Unequal flange	Gray	-
3353038	7'-11'6"	-	Unequal flange	Gray	-
3353039	7'-9'	-	Network	Blue	-
3353040	7'-11'6"	-	Network	Blue	-

Note: All bays contain the BR1/10 2X Chassis, ADTRAN Part Number 1150081L1, CLEI D4MEZB02RA,CPR 135143, Telect Fuse Panel Part Number 009-0014-1001SWB. Bays and mounting hardware are supplied from Newton Instrument Company, Inc.

BAY TYPE AND HARDWARE INCLUDED / RECOMMENDED WITH UNEQUAL FLANGE BAYS

Description	Newton Part Number
7' Relay rack	4100-1
Junction detail	4103
Shim kit	2136040010
Floor mounting hardware	4110
2" guard rail	4105-2
* End cover kit	4108-1

BAY TYPE AND HARDWARE INCLUDED / RECOMMENDED WITH NETWORK BAYS

Network bay kit	4487-1
Floor mounting hardware	4422
* End cover kit	4333-1

* Not included, recommended

ADDITIONAL HARDWARE INCLUDED WITH BAYS

Description	Quantity
1 amp GMT fuse	2 times the number of chassis
1 amp fuse designation pin (gray)	2 times the number of chassis
Fuse panel terminal connector	4

2. INSTALLATION

Mounting Hardware

Before beginning, locate the hardware as illustrated in Figure 2 and described in Table 2 (included with the assembly). Use the following guidelines:
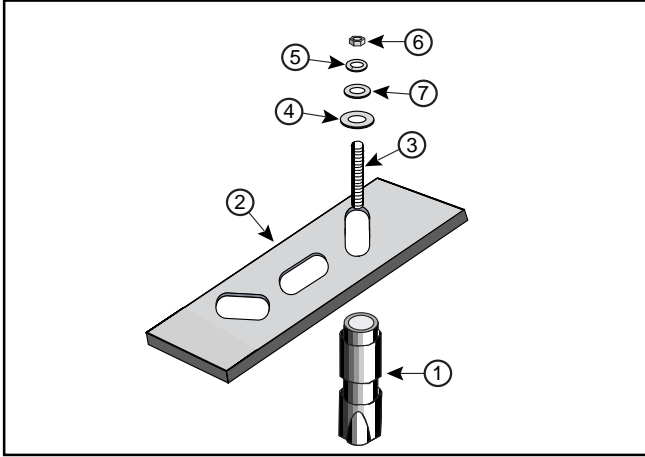

Figure 2. Mounting Hardware

Table 2. Mounting Hardware

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	4	3018-4	3/8x2 Exp. Shield
2	2	A-6169	Hold Down Bar
3	4	3023-2	Stud 3/8-16 Thread
4	4	3016-8	5/8 Flat washer
5	4	3015-6	3/8 Lock washer
6	4	3014-6	3/8-16 Hex nut
7	4	3016-7	1/2 Flat washer
*8	4	3016-6	3/8 Flat washer

* Hardware not shown.

Prepare the Site

1) Position the bay in the desired location

2) Using a pencil or wax marker, trace the outline of the mounting holes in the base (see Figure 3).

3) Remove the bay from the mounting location.

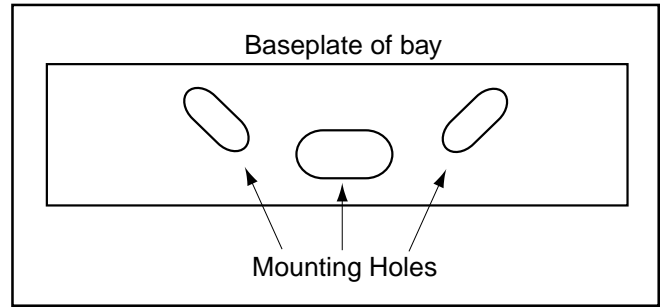4) Drill holes for the anchors, remove any debris, and insert the expansion shields.

Figure 3. Mounting Holes

Mounting the Bay

1) Reposition the base mounting holes over the installed expansion shields.

2) Install the two hold-down bars over the holes in the base.

3) Install the washers over the holes in the hold-down bar.

4) Insert stud into concrete anchor.

5) Tighten fastener with wrench.

6) Repeat steps three through five for each concrete expansion shield.

7) Ensure that all mounting hardware is tight.

3. CONNECTIONS

The Power and composite clock connections of the BR1/10 bay assemblies are prewired at the factory. Alarms, DSX-1, and tip/ring (T/R) wiring is left to the discretion of the CO installation personnel. All bays include either one or two Telect fuse and alarm panel(s) depending on the number of chassis. All permanent connections to the BR1/10 2X chassis are made on the backplane of the unit. Each chassis contain two separate printed circuit boards, side A and side B. Looking at the chassis from the rear, side A is located on the right while side B is located on the left. For reference, refer to Figure 4 for an illustration of the rear of the 20 chassis configuration, part number 4150BR2x10RL20.

The prewired power connections are made on terminal strip JP16. DS0 connections are made using the 50 pin female amphenol connnector JP14. All remaining connections are made on terminal strips JP15 and JP17. Figure 5 displays the rear of a single side the BR1/10 2X chassis. Table 3 describes the pin designators for JP15, JP16, and JP 17.
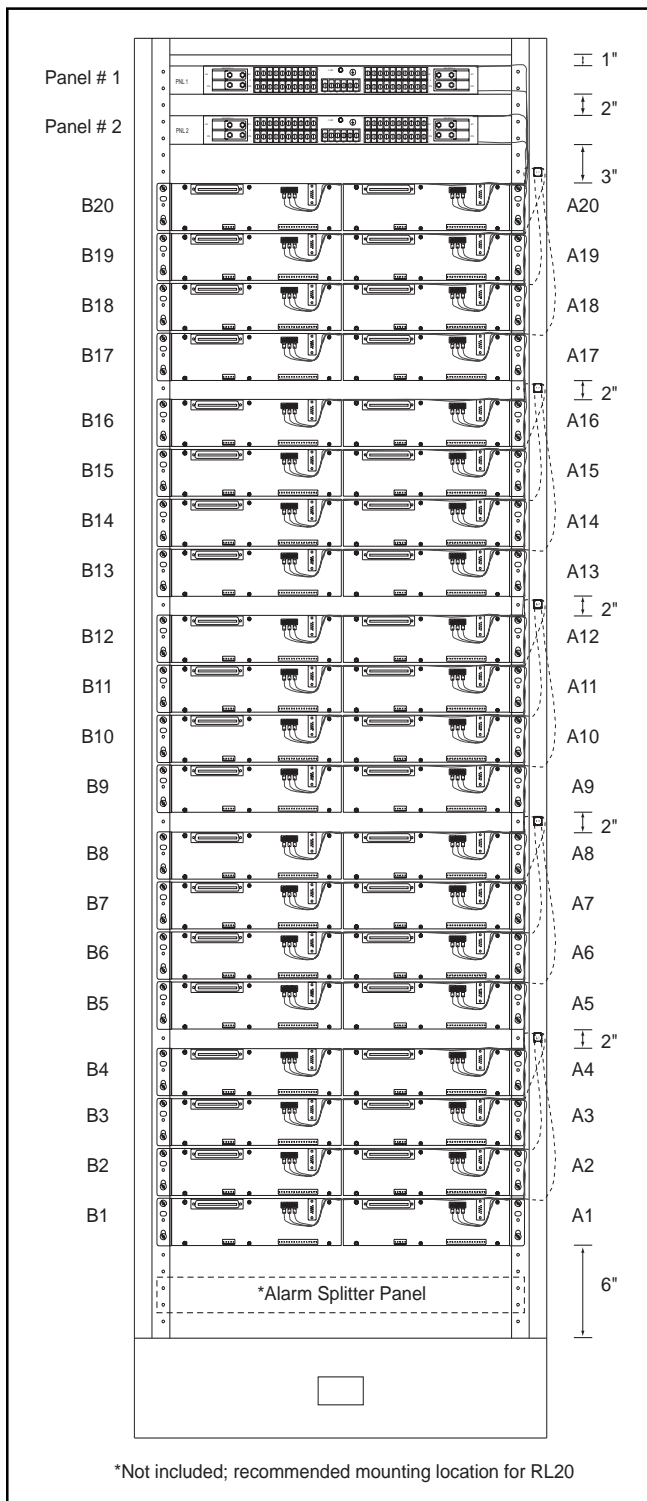
Figure 4. Rear of 4150.BR2x10RL20

Alarm Splitter Panels

Alarm splitter panels are not included. If needed, the recommended mounting position for the RL20 is two mounting holes from the bottom of the bay (see Figure 6). The alarm panel maybe mounted in any preferred location in the remaining assemblies (RL4, RL8, RL12, RL16).

Fuse Panel Connections

All chassis, in the bay configurations, are connected to the fuse panel at the top of the bay using 16 AWG stranded wire. Figure 6 illustrates the rear of the Telect fuse panel. Perform the following steps to connect the BR1/10 bay to the CO power source:

1) Connect #6 AWG wire from the office frame ground to the Frame Ground terminal located in the center of the fuse panel.

2) Connect the ground from the –48 VDC power supply to the –48V terminal of the A side (right) of fuse panel.

3) Connect the –48 VDC from the –48 VDC power supply to the RTN terminal of the A side (right) of fuse panel.

If a redundant CO power source is available, connect to the B side of the fuse panel by following steps 1 through 3.

Several fuse panel accessories are included with the bay assembly in separate packaging. These accessories include:

- Appropriate number of 1 amp GMT fuses

- Appropriate number of Gray 1 amp fuse designation pins for insertion above the fuses

- Four terminal connecters for power connections

Intra-Bay Power Connections

The following information describes the chassis-to-fuse panel factory wiring and is provided for reference. Shelves 1-10 are connected to fuse panel #1 and shelves 10-20 are connected to fuse panel #2. Each wire is terminated at the fuse panel and shelf with crimp type ring-lugs. The power connections on the BR1/10 chassis are located on the three-position terminal strip, JP16. The red (–48VDC) and black (RTN)wires are connected to "–48I" and "–48R" terminals on JP16, respectively. Figure 7 displays connections to JP16. Table 4 describes the fuse panel connections for each chassis.

Bay Stenciling

The BR1/10 relay racks and fuse panels are stenciled to provide correlations of individual fuses to shelves. The bays are stenciled on the side of the relay rack (A1-A20 and B1-B20) starting at the bottom. A sticker, located on the fuse panel, identifies the fuse for each shelf (A1-A20 and B1-B20).
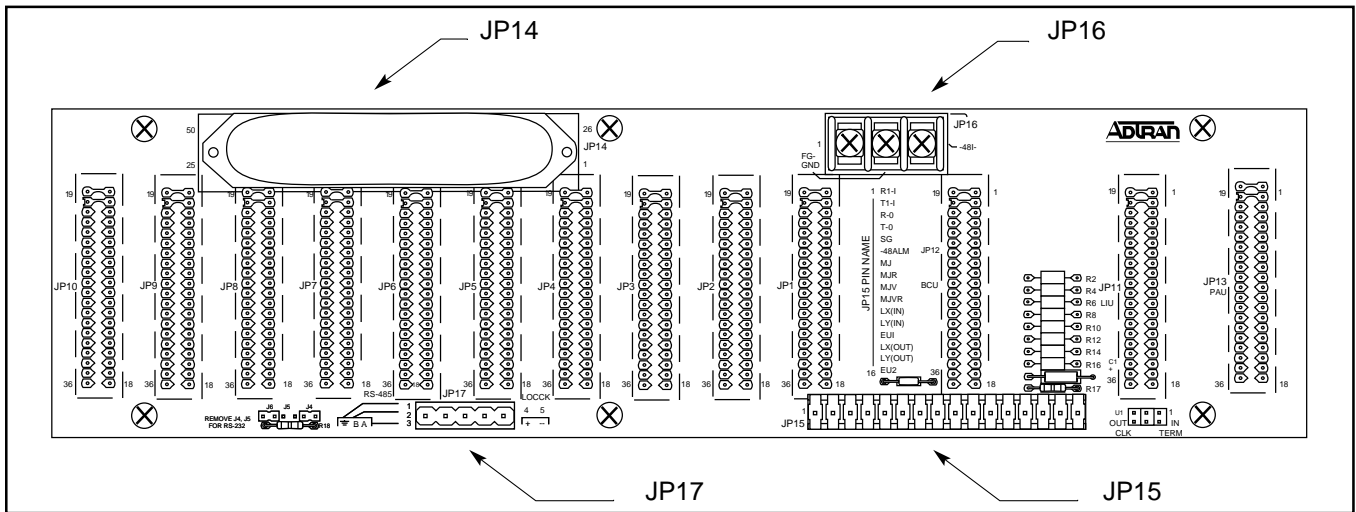
Figure 5. BR1/10 Backplane

Table 3. JP15, JP16, JP17 Descriptions

JP15		
Pin	**Label**	**Description**
1	R1-I	DSX-1 Ring input from the network
2	T1-I	DSX-1 Tip input from the network
3	R-O	DSX-1 Ring output to the network
4	T-O	DSX-1 Tip output to the network
5	SG	Shield Ground, Cable shield for DSX-1
6	– 48ALM	– 48VDC Alarm, output – 48VDC when PAU fuse tripped
7	MJ	Major Alarm Audible, normally open contacts. ACO provides an override during bank alarm
8	MJR	Major Alarm Audible, common
9	MJV	Major Alarm Visual, normally open contacts
10	MJVR	Major Alarm Visual, common
11	LX(IN)	Input BITS compatible composite clock
12	LY(IN)	Input BITS compatible composite clock
13	EU1	Cable shield for output clock
14	LX(OUT)	Output BITS compatible composite clock
15	LY(OUT)	Output BITS compatible composite clock
16	EU2	Cable shield for input clock
JP16		
1	FG	Frame Ground
2	– 48R	– 48VDC Return
3	– 48I	– 48VDC Input
JP17		
1	GND	Ground
2	B	Future Applications
3	A	Future Applications
4	+	Local Clock (+)
5	-	Local Clock (-)
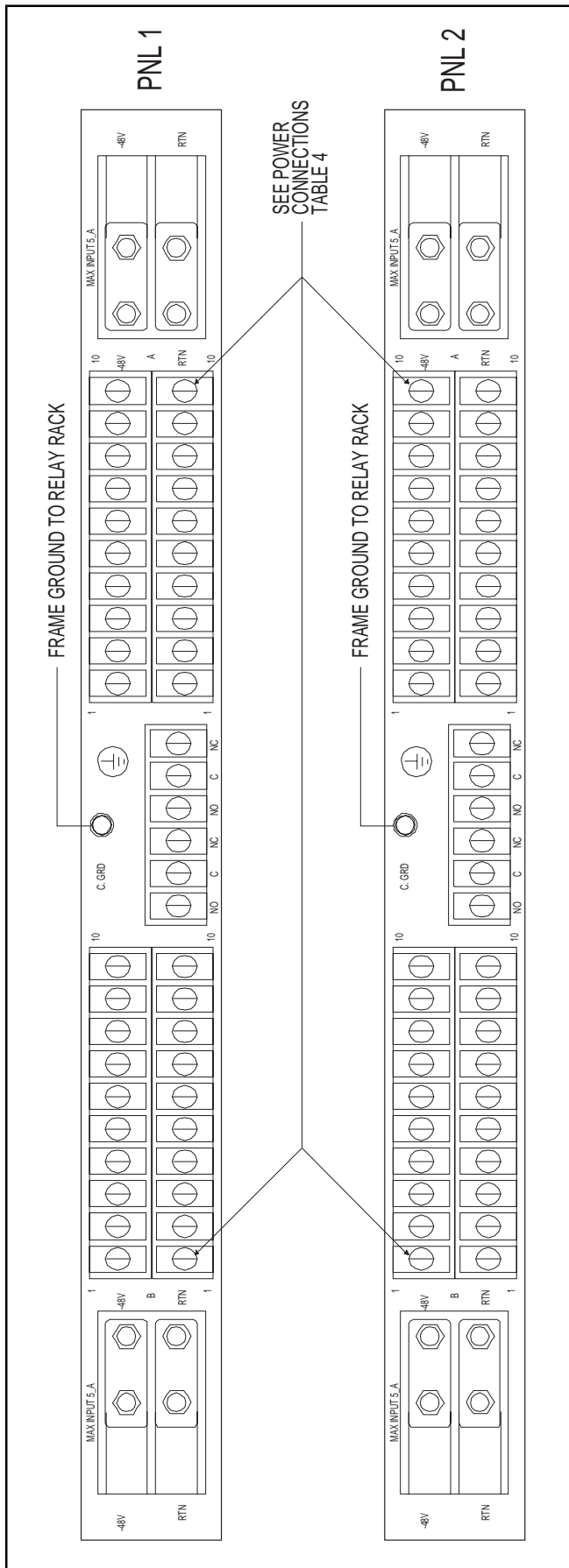
Figure 6. Rear of Telect Fuse Panel
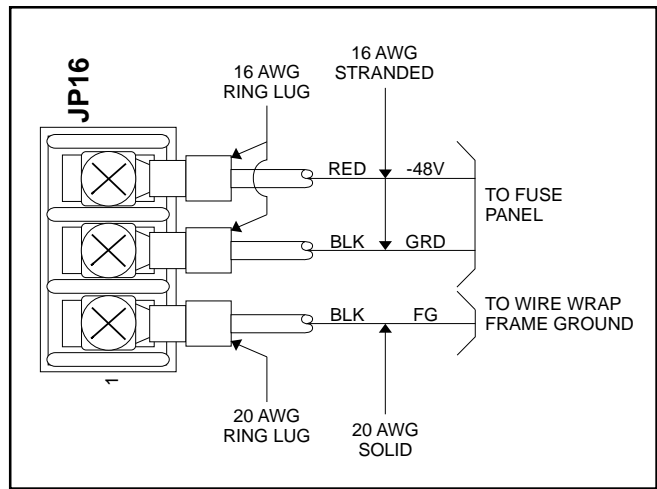
Figure 7. Power Connections on JP16

Table 4. Fuse Panel Connections

FUSE PANEL # 1		FUSE PANEL # 2	
Fuse Panel Connections	BR1/10 Shelf #	Fuse Panel Connections	BR1/10 Shelf #
A1	A1	A1	A11
A2	A2	A2	A12
A3	A3	A3	A13
A4	A4	A4	A14
A5	A5	A5	A15
A6	A6	A6	A16
A7	A7	A7	A17
A8	A8	A8	A18
A9	A9	A9	A19
A10	A10	A10	A20
B1	B1	B1	B11
B2	B2	B2	B12
B3	B3	B3	B13
B4	B4	B4	B14
B5	B5	B5	B15
B6	B6	B6	B16
B7	B7	B7	B17
B8	B8	B8	B18
B9	B9	B9	B19
B10	B10	B10	B20
Note: Refer to Figures 1 and 4 for BR1/10 shelf location.			

Office Timing Supply

The composite clock leads of the BR1/10 bay assemblies are daisy chained together within each respective four-chassis grouping. A single input on each grouping is available for connection to the Building Integrated Timing Supply (BITS). Figure 8

Figure 8. Local Composite Clock Wiring for a Set of Four Chassis
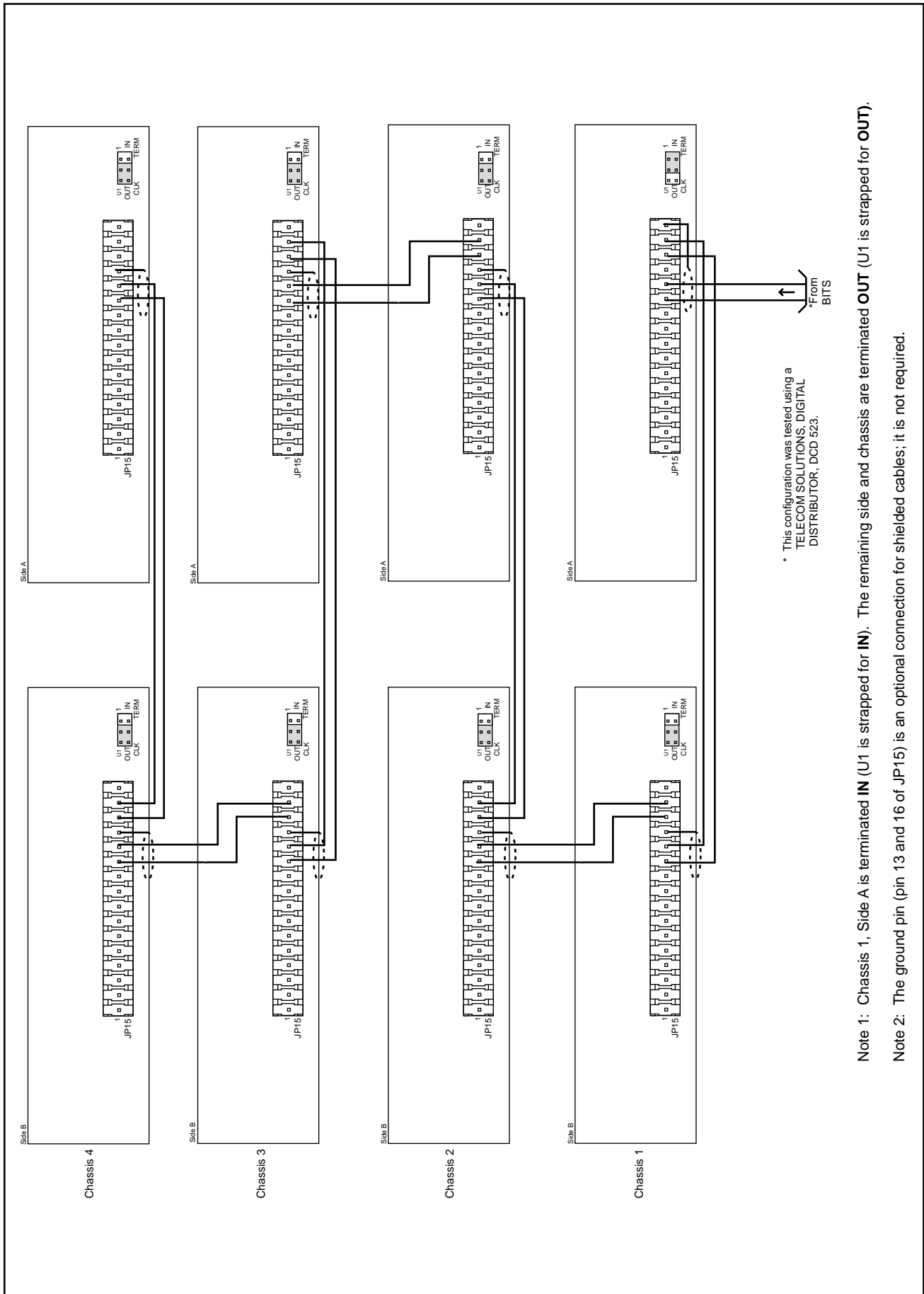
Note 1: Chassis 1, Side A is terminated **IN** (U1 is strapped for **IN**). The remaining side and chassis are terminated **OUT** (U1 is strapped for **OUT**).

Note 2: The ground pin (pin 13 and 16 of JP15) is an optional connection for shielded cables; it is not required.

* This configuration was tested using a
TELECOM SOLUTIONS, DIGITAL
DISTRIBUTOR, DCD 523.

ADTRAN   Section 64150BR2X10RL1-5, Issue 1   64150BR2X10RL1-5A

illustrates factory bay wiring and Table 5 outlines the location of the BITS connections. Refer to Figure 1 for chassis location.

> **NOTE** *In order to maintain the integrity of the composite clock signal, the number of BR1/10 2X chassis on a single clock lead is limited to eight, or four 2X chassis. Each four-chassis grouping connects to a separate clock lead.*

Table 5. BITS Connection Locations

BAY CONFIGURATION	CHASSIS CONNECTIONS
4150BR2x10RL1	A1
4150BR2x10RL4	A1
4150BR2x10RL8	A1, A5
4150BR2x10RL12	A1, A5, A9
4150BR2x10RL16	A1, A5, A9, A13
4150BR2x10RL20	A1, A5, A9, A13, A17

The Office Timing input/output pins for the BR1/10 2X chassis are located on JP 15, pins 11-16. The incoming BITS connects to pins LX (**IN**) and LY (**IN**); EU2 is used to shield the two inputs. Figure 9 illustrates composite clock connections.

Office Alarms

The backplane connections for the alarm relays are found on JP15, pins 7 thru 10, and are labeled MJ, MJR, MJV, and MJVR (see Figure 10).

The alarm relay contacts are normally open when the BR1/10 is functioning properly, and no alarms are received from the T1 carrier. The alarm relay contacts will close in the event of a local alarm condition or the receipt of an alarm from a T1 carrier. In a carrier alarm condition such as red, yellow, or blue (Unframed All 1's), several alarm relay contacts located in the BR1/10 close. Carrier alarm conditions cause the BR1/10 to go into trunk processing and the following events will occur:

1. MJ will be directly shorted to MJR

2. MJV will be directly shorted to MJVR

Contacts MJ/MJR can be manually overridden during an Alarm Condition. The ACO push-button on the BR1/10 PAU faceplate will open the contacts during a bank alarm condition providing a means to control an external Audible Alarm. No other alarm contacts are affected by the ACO push-button.
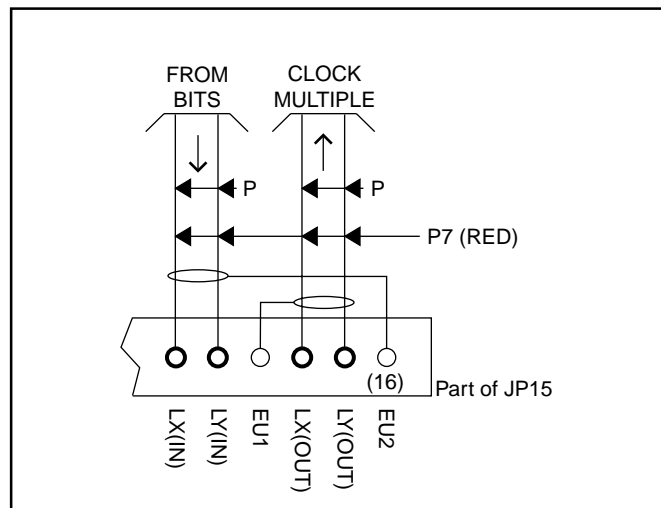
Figure 9. Office Timing Connections on JP15
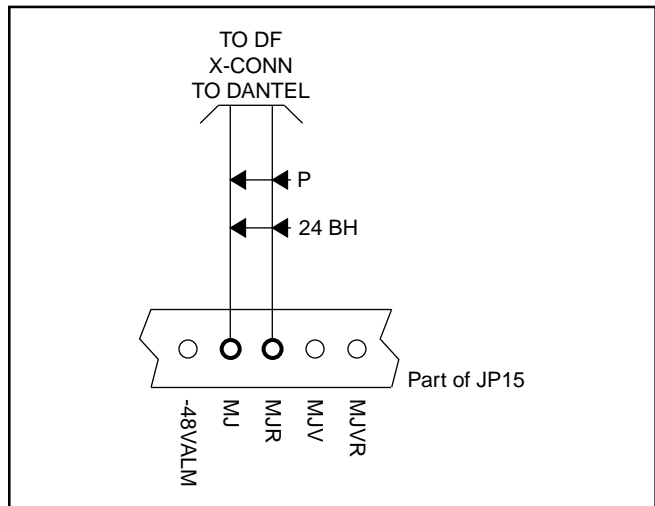
Figure 10. Alarm Connections on JP15

The BR1/10 PAU List 2, P/N 1150078L2, provides alarm relay contact closure in the event the –48V PAU faceplate fuse is tripped. In this alarm condition, the relay contacts will close in the same manner as if the BR1/10 was in a Carrier alarm condition, but depressing the ACO push-button will not cancel the audible alarm.

Relay contact closures are a function of the PAU common unit only, not the chassis. A summarization of alarm notification is found in Table 6.

DSX-1 and DS1

DSX-1 and DS1 connections are made via JP15, pins 1 through 5 (see Figure 11). The Line Interface Unit (LIU)List 1, part number 1150079L1, provides termination for a DSX-1 signal only. The LIU List 2, part number 1150097L2, provides termination for

Table 6. Alarm Notification

CONDITION	RELAYS ACTIVATED		OTHER
	MJR	MJVR	– 48 ALM
Red Alarm	X	X	
Yellow Alarm	X	X	
AIS Alarm	X	X	
PAU fuse blown	X[1]	X[1]	X
ACO Deactivates	X[2]	X[2]	

[1]PAU List 2, P/N 1150078L2, only.
[2]ACO does not deactivate MJR/MJVR during a blown fuse condition

Figure 11. DSX-1 Connections on JP15

either DSX-1 or DS1 signal. Line build out and equalization settings are made on the Bank Controller Unit (BCU).

DS0 Connections

One 50-pin amphenol connector (JP14) is provided for the interconnect wiring of the ten channel positions for each BR1/10 backplane. The connector provides Tip/Ring (T/R) and Tip1/Ring1 (T1/R1) connections to the chassis. Leads T1 and R1 are not used in applications requiring the BR1/10 U-BRITE. The T1 and R1 leads will be used in future applications. Figure 12 details the pinout of the JP14 connector.
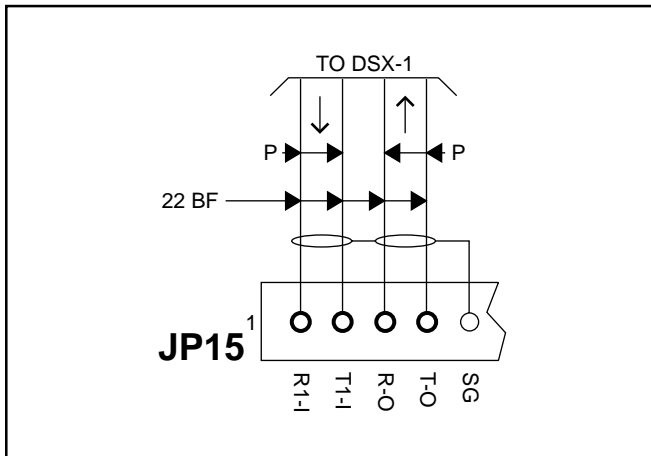
> NOTE
> *A DSL continuity tester channel unit (streaker), ADTRAN part number 1150377L1, is available for testing the integrity of the DS0 wiring from the BR1/10 channel bank to the main distribution frame.*

> NOTE
> *The color codes depicted in Figure 12 are applicable when a direct cable is used. The Tip/Ring leads are reversed when compared to most color code design. ADTRAN has developed cables (see next section) which convert the Tip/Ring leads to provide conformance to normal color code design.*

Central Office Cables

Cables can be obtained from ADTRAN. In order to minimize cable congestion in the bay and cable troughs, ADTRAN has developed cables which combine the A&B side amphenol connections of single or multiple shelves onto a single cable.

Two types of cables are available: a 2:1 and 8:1 cable. The 2:1 cable combines the A&B sides of a single BR1/10 2X chassis onto one cable; one end has two male amphenol connectors and the other is a stub. The 8:1 cable combines the A&B sides of four BR1/ 10 2X chassis onto one cable; one end has eight male amphenol connectors and the other is a stub. Both cables are available in various lengths outlined in Table 7. Figure 13 provides and illustration of the cables.

> NOTE
> *The cables listed above only wire out the T & R leads, not T1 & R1. These and other custom cable assemblies can be obtained from Pinkerton Cables Incorporated*.
> *Pinkerton Cables Incorporated, Phone: (800) 529-7133.*

Table 7. Available Cable Lengths

DESCRIPTION	LENGTH (ft.)	ADTRAN PART NO.
2:1	50	3353027
2:1	75	3353028
2:1	100	3353029
2:1	150	3353030
2:1	225	3353031
8:1	50	3353032
8:1	75	3353033
8:1	100	3353034
8:1	150	3353035
8:1	225	3353036

Figure 12. Telco Connector (JP14) Pinout

BR1/10
BACKPLANE
JP14
50 PIN
AMP
PLUG

50 PIN AMP RECEPTACLE

CROSS CONNECT AS REQUIRED

Pin	Pin			
25	50		NC	
24	49		NC	
			NC	
23	48		NC	
			NC	
22	47		NC	
			NC	
21	46		NC	
			NC	
20	45	P	CHANNEL 10	R	YEL/BRN
			CHANNEL 10	T	BRN/YEL
19	44	P	CHANNEL 10	R1	YEL/SLT
			CHANNEL 10	T1	SLT/YEL
18	43	P	CHANNEL 9	R	YEL/ORN
			CHANNEL 9	T	ORN/YEL
17	42	P	CHANNEL 9	R1	YEL/GRN
			CHANNEL 9	T1	GRN/YEL
16	41	P	CHANNEL 8	R	BLK/SLT
			CHANNEL 8	T	SLT/BLK
15	40	P	CHANNEL 8	R1	YEL/BLU
			CHANNEL 8	T1	BLU/YEL
14	39	P	CHANNEL 7	R	BLK/GRN
			CHANNEL 7	T	GRN/BLK
13	38	P	CHANNEL 7	R1	BLK/BRN
			CHANNEL 7	T1	BRN/BLK
12	37	P	CHANNEL 6	R	BLK/BLU
			CHANNEL 6	T	BLU/BLK
11	36	P	CHANNEL 6	R1	BLK/ORN
			CHANNEL 6	T1	ORN/BLK
10	35	P	CHANNEL 5	R	RED/BRN
			CHANNEL 5	T	BRN/RED
9	34	P	CHANNEL 5	R1	RED/SLT
			CHANNEL 5	T1	SLT/RED
8	33	P	CHANNEL 4	R	RED/ORN
			CHANNEL 4	T	ORN/RED
7	32	P	CHANNEL 4	R1	RED/GRN
			CHANNEL 4	T1	GRN/RED
6	31	P	CHANNEL 3	R	WHT/SLT
			CHANNEL 3	T	SLT/WHT
5	30	P	CHANNEL 3	R1	RED/BLU
			CHANNEL 3	T1	BLU/RED
4	29	P	CHANNEL 2	R	WHT/GRN
			CHANNEL 2	T	GRN/WHT
3	28	P	CHANNEL 2	R1	WHT/BRN
			CHANNEL 2	T1	BRN/WHT
2	27	P	CHANNEL 1	R	WHT/BLU
			CHANNEL 1	T	BLU/WHT
1	26	P	CHANNEL 1	R1	WHT/ORN
			CHANNEL 1	T1	ORN/WHT

Figure 12. Telco Connector (JP14) Pinout

J-2
J-1

2:1 Cable

J-2
J-2
J-2
J-2
J-1

8:1 Cable
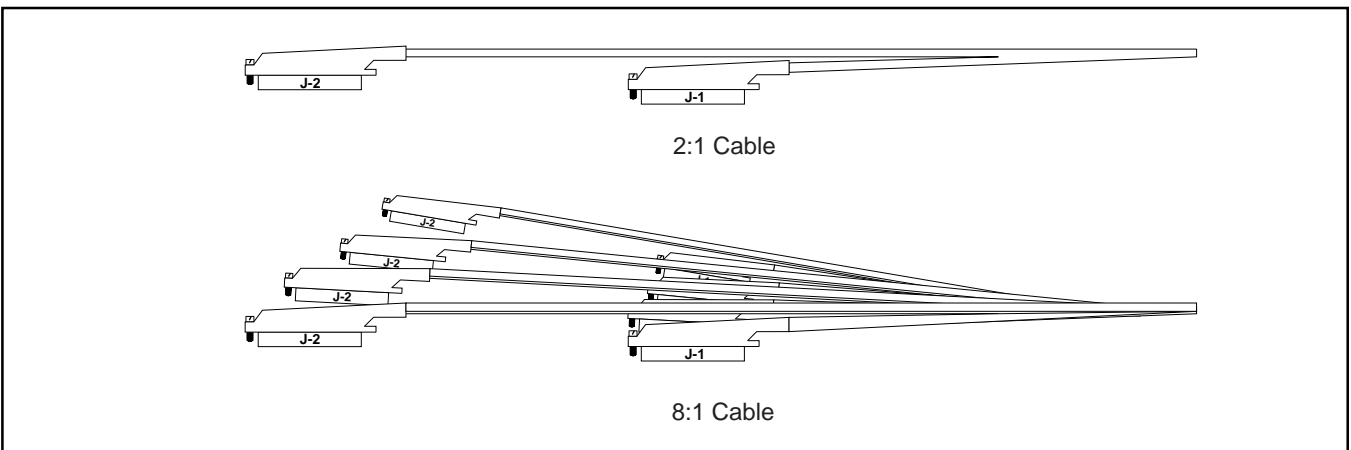
Figure 13. Installation Cables

4. MAINTENANCE

The BR1/10 2x Chassis requires no routine maintenance to operate properly. Test and maintenance for the specific plug-ins should be conducted in accordance with the recommendations and procedures prescribed in associated Installation and Maintenance Practices.

ADTRAN does not recommend that repairs be performed in the field. Repair services are obtained by returning the defective unit to ADTRAN's Customer Service.

5. SPECIFICATIONS

Refer to Table 8 for unit and bay specifications.

6. WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within 10 years from the date of shipment if it does not meet its published specifications or fails while in service (see *ADTRAN Telco Network Equipment Warranty, Repair, and Return Policy and Procedure,* document 60000087-10A).

Contact Customer and Product Services (CAPS) prior to returning equipment to ADTRAN.

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

ADTRAN Technical Support
(800) 726-8663
Standard hours: Monday-Friday, 7 am-7 pm CST
Emergency hours: 7 days/week, 24 hours/day

ADTRAN Sales
(800) 827-0807

ADTRAN Repair/CAPS
(256) 963-8722

Repair and Return Address
ADTRAN, Inc.
Customer & Product Services (CAPS) Department
901 Explorer Boulevard
Huntsville, Alabama 35806-2807

Table 8. Specifications

UNIT SPECIFICATIONS					
Environmental					
Operating temperature: Storage temperature: Relative humidity:	– 40 to 158° F, – 40 to 70° C – 40 to 185° F, – 40 to 85° C Up to 95%, noncondensing				
Physical					
Bay dimensions: BR1/10 chassis dimensions:	7' H x 2.2' W x 1' D 2.8" H x 21.2" W x 10.5" D				
Weight					
	Bay		**Shipping**		
RL1 RL4 RL8 RL12 RL16 RL20	107 lbs 128 lbs 156 lbs 184 lbs 212 lbs 240 lbs		257 lbs 278 lbs 306 lbs 334 lbs 362 lbs 390 lbs		
BAY SPECIFICATIONS					
Part Number	**RL4**	**RL8**	**RL12**	**RL16**	**RL20**
Bay size # of chassis # of fuse panels # T1s # U interfaces # 1 amp fuses Power/fusing	7' 4 1 8 80 8 8 amp max	7' 8 1 16 160 16 16 amp max	7' 12 2 24 240 24 24 amp max	7' 16 2 32 320 32 32 amp max	7' 20 2 40 400 40 40 amp max
Relay Rack Part Number					
Newton	4100-1	4100-1	4100-1	4100-1	4100-1
Fuse Panel Part Number					
Telect	009-0014-10-01SWB	009-0014-10-01SWB	009-0014-10-01SWB	009-0014-10-01SWB	009-0014-10-01SWB
Composite Clock Connection					
Clock (JP15--Pins 11 & 12)	Bank 1	Banks 1, 5	Banks 1, 5, 9	Banks 1, 5, 9, 13	Banks 1, 5, 9, 13, 17