

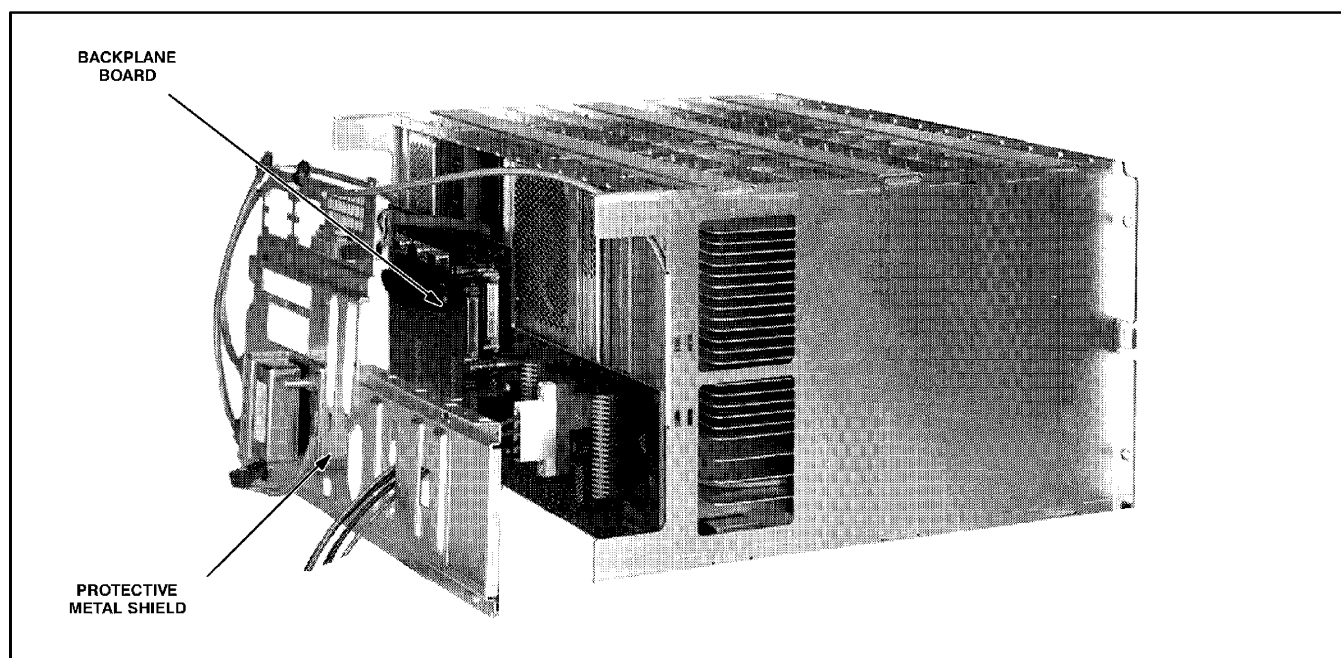
## 1 DESCRIPTION

The TRN7480A Station Backplane Board provides the electrical interconnections for the plug-in modules of a *Quantar* station. The board also provides the connectors necessary to interface the station to phone lines, peripheral rf equipment, and other communications and maintenance equipment. This section provides a general description, identification of inputs/outputs, and a pin-out listing for all interface connectors, including information on signal names, functions, and levels.

### General Description

The station backplane board (mounted across the rear of the *Quantar* station card cage) is constructed with connectors on both sides. The connectors on one side mate with the various station plug-in modules; the connectors on the other side allow interface connections between the station and the phone lines, peripheral rf equipment, and other communications and maintenance equipment.

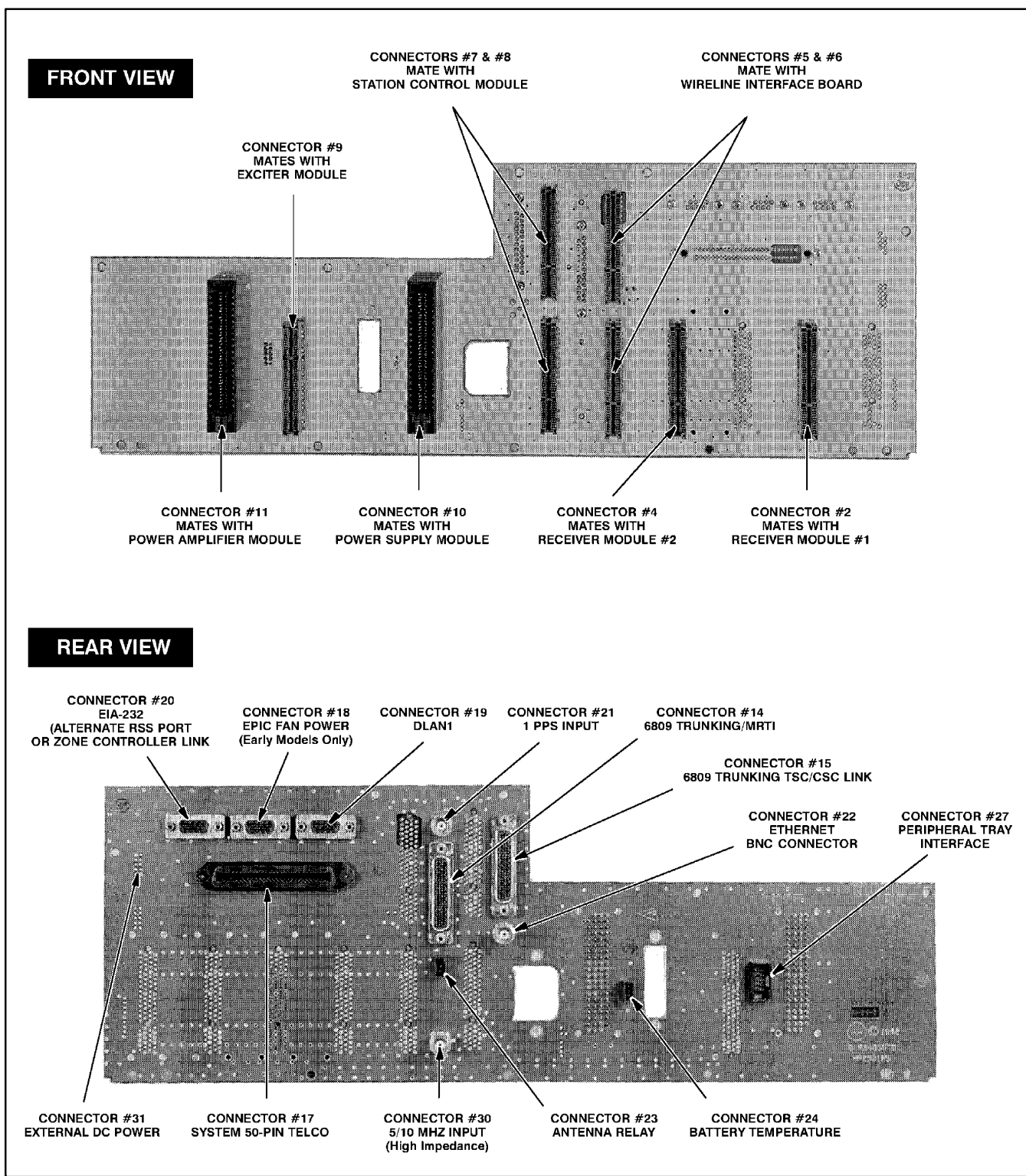
A metal shield mounts over the rear of the backplane board to provide protection for the circuit board runners and connector solder pads, ESD protection, and EMI/RFI shielding, as shown in Figure 1. This shield also provides a mounting location for the antenna connector bracket and the station grounding lug.



**Figure 1.** Backplane (Shown with Protective Metal Shield Removed)

## 2 LOCATION OF BACKPLANE CONNECTORS

Figure 1 shows the location of the connectors on each side of the station backplane board.



**Figure 2.** Quantar Station Backplane (TRN7480A) Connector Locations (Front and Rear Views)

### 3 BACKPLANE CONNECTORS INFORMATION

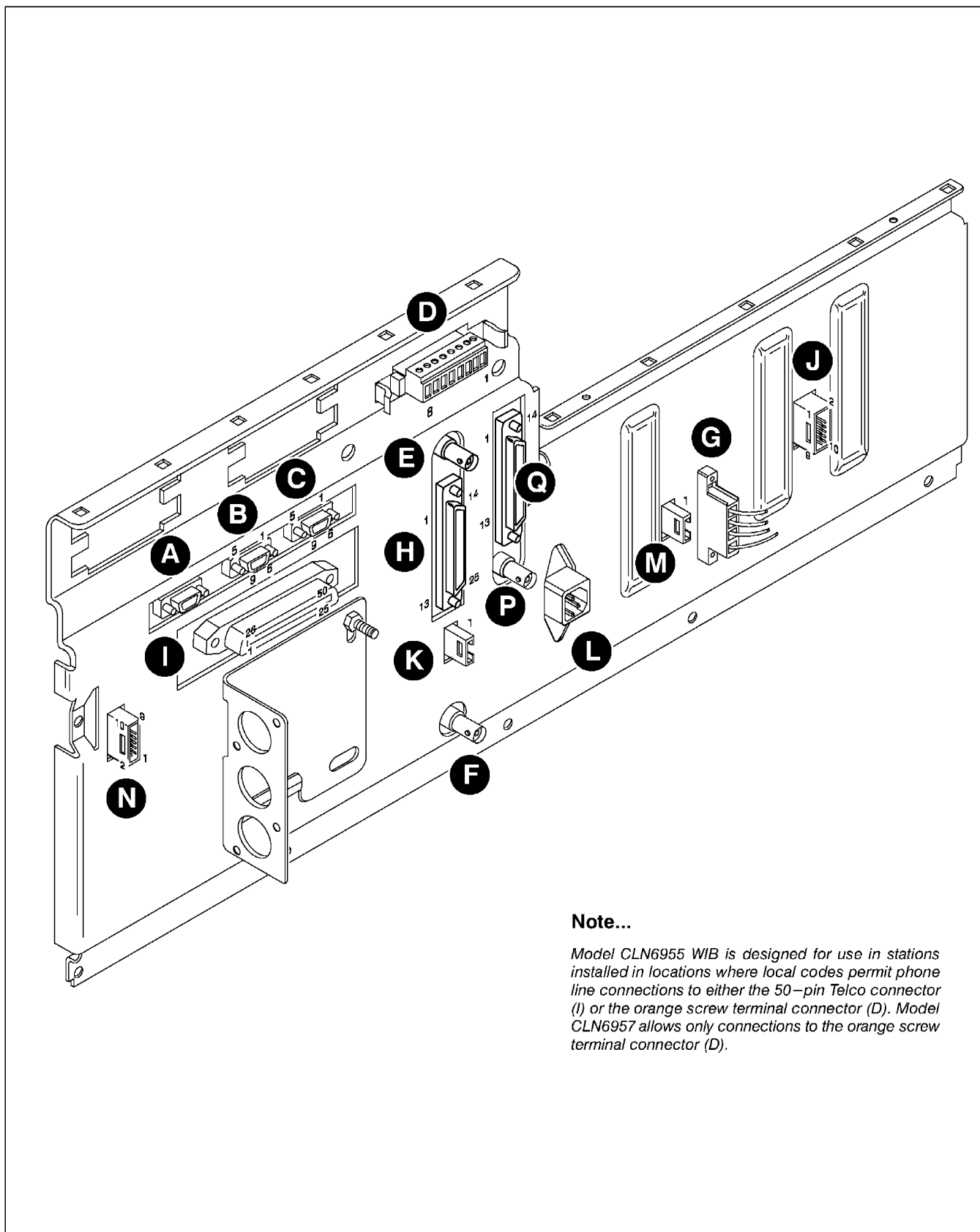
Each connector on the backplane has been assigned a connector number. In some cases, the connector number is stamped into the metal shield covering the rear of the backplane board. The connectors which accept the plug—in modules are not marked. Table 1 lists each connector and its assigned number.

Figure 3 provides pin—out information for all connectors located on the rear of the backplane board. As shown, each connector pin is defined by signal name, input or output (with reference to connector), to/from location, and a brief description of the signal function. Note that pin—out information for any connectors intended for future applications is not shown. Also, note that in the “To/From” column the source or destination of the signal is given as a connector number followed by a pin number. The first number (preceded by a “#”) represents the assigned connector number, followed by the specific connector pin number.

**Table 1.** Assigned Connector Number vs Function/Location Information

Connector #	Function/Location
1	Not used
2	Accepts plug—in Receiver Module #1
3	Not used
4	Accepts plug—in Receiver Module #2
5	Accepts bottom card—edge connector of plug—in Wireline Interface Board
6	Accepts top card—edge connector of plug—in Wireline Interface Board
7	Accepts bottom card—edge connector of plug—in Station Control Module
8	Accepts top card—edge connector of plug—in Station Control Module
9	Accepts plug—in Exciter Module
10	Accepts plug—in Power Supply Module
11	Accepts plug—in Power Amplifier Module
12	Not used
13	Not used
14	Provides interface for 6809 Trunking Controller and (future) MRTI Interface
15	Accepts TSC/CSC Link cable from 6809 Trunking Controller
16	Not used
17	50—pin Telco System Connector (accepts customer phone line connections, access to customer—defined inputs/outputs, Simulcast inputs, etc.; connector located on backplane at rear of station)
18	Provides dc power to external fan module for early model EPIC Station Control Modules (limited production)
19	DLAN1 DB—9 connector (used in <i>IntelliRepeater</i> applications to form network between multiple stations; connector located on backplane at rear of station; mates with DB—9—to—dual RJ11 <i>PhoneNET</i> adapter module; see note above)
20	EIA—232 asynchronous port (used for connection to <i>SMARTZONE</i> controller in wide—area <i>IntelliRepeater</i> trunking system or for alternate RSS port in a non— <i>IntelliRepeater</i> trunking system)
21	1 PPS input from GPS Receiver for <i>ASTRO</i> Simulcast systems
22	BNC connector which allows connection to an <i>IntelliRepeater</i> Ethernet network via a 10BASE—2 coaxial T—connector. Also may be used to locally connect PC running RSS to download software to FLASH memory in Station Control Module.
23	Antenna Relay 3—pin AMP—type connector (used to supply control signal to antenna relay module; connector located on backplane at rear of station)
24	Battery Temperature 3—pin AMP—type connector (used to accept variable resistance proportional to temperature of co—located storage batteries; connector located on backplane at rear of station)
25	Not used
26	Not used
27	RF Peripheral Tray 10—pin AMP—type connector (used to transfer signals to/from components housed in externally—mounted RF Peripheral Tray; connector located on backplane at rear of station)
28	Not used
29	Not used
30	BNC input connector (used to accept 5/10 MHz reference signal from external frequency standard for calibrating reference oscillator in Station Control Module; connector located on backplane at rear of station; electrically isolated from BNC connector on front panel of Station Control Module to allow for multi-drop configuration)
31	Provides external +5V and +14.2 V dc power (e.g., MRTI, Modem, etc.)

*PhoneNET* is a registered trademark of Farallon Computing, Inc.



**Figure 3.** TRN7480A Backplane Rear Connectors Pin-Out Information (Sheet 1 of 3)

A

CONNECTOR #20EIA-232 (Alternate RSS Port)				
Pin #	Signal	Input	Output	Function
1	DCD1	✓		Data Carrier Detect
2	RXD1	✓		Receive Data
3	TXD1		✓	Transmit Data
4	DTR		✓	Data Terminal Ready
5	SIGNAL GND			Station Ground
6	DSR	✓		Data Set Ready
7	RTS1		✓	Request to Send
8	CTS1	✓		Clear to Send
9	Ring Indicator			Not used

B

CONNECTOR #18EPIC Fan Control (Early Models Only)				
Pin #	Signal	Input	Output	Function
1	FAN GND			Ground for external fan
2				
3				
4				
5				
6				
7				
8	FAN +		✓	+14.2 V dc for external fan
9				

C

CONNECTOR #19DLAN1				
Pin #	Signal	Input	Output	Function
1	Shield Gnd			Station Ground
2	WFI+			Future use
3	WFI—			Future use
4	DLAN1+	✓	✓	Differential Data (+)
5	DLAN1—	✓	✓	Differential Data (—)
6	WFI+			Future use
7	WFI—			Future use
8	DLAN1+	✓	✓	Differential Data (+)
9	DLAN1—	✓	✓	Differential Data (—)

D

PHONE LINE INPUTS			
1	LINE 1 +	5	LINE 3 +
2	LINE 1 —	6	LINE 3 —
3	LINE 2 +	7	LINE 4 +
4	LINE 2 —	8	LINE 4 —

E

CONNECTOR #21	
1 PPS	
1 PPS clock signal from GPS Receiver for ASTRO Simulcast application. TTL levels @ 50 ohms.	

F

CONNECTOR #30	
5/10 MHZ INPUT	
Accepts external 5 or 10 MHZ Frequency Standard for Calibrating Station Reference Oscillator (located in Station Control Module); 5 MHz injection level = 1.0 ± .5 V RMS; High Impedance Input	

G

CONNECTOR #25	
BATTERY CHARGER OUTPUT	
Two RED (top) and two BLACK (bottom) wires to battery revert connector mounted on station cage.	

H

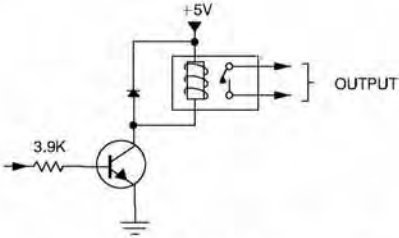
CONNECTOR #146809 TRUNKING/MRTI				
Pin #	Signal	Input	Output	Function
1	MRTI TX Audio			MRTI
2	MRTI PTT			MRTI
3	Open			MRTI
4	Monitor			MRTI
5	PL Strip			MRTI
6	Open			MRTI
7	MRTI RX Audio			MRTI
8	Patch INH			MRTI
9	Gnd			MRTI
10	AUX Indicate			Future use
11	TPTT	✓		Control signal to key transmitter (active low) (6809)
12	TSTAT		✓	Indicates transmitter status (active high) (6809)
13	Tx Data +	✓		Modulation input from 6809 Controller (6809)
14	Open			
15	Rx Carrier			MRTI
16	Gnd			Station Ground (6809)
17	Gnd			Station Ground (6809)
18	Gnd			Station Ground (6809)
19	Gnd			Station Ground (6809)
20	Gnd			Station Ground (6809)
21	Tx Data —	✓		Modulation input from 6809 Controller (6809)
22	Rx Wideband Aud		✓	Receive output to 6809 Controller (6809)
23	MUTE	✓		Mutes station signals (active low) (6809)
24	CCI	✓		Indicates Control Channel status (active low) (6809)
25	RSTAT			Indicates receiver status (active high) (6809)

I

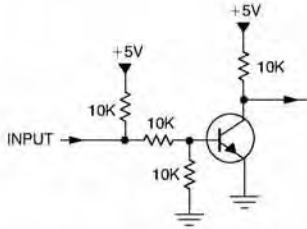
CONNECTOR #17SYSTEM 50-PIN TELCO				
Pin #	Signal	Input	Output	Function
1	Line 1 +	✓		Customer 4-wire Phone Line Input (Line 1+)
2	Line 2 +	✓	✓	Customer 2-wire Phone Line Input/Output (Line 2+)
3	Line 3 +	✓		Customer 4-wire Phone Line Input (Line 3+)
4	Line 4 +		✓	Customer 4-wire Phone Line Output (Line 4+)
5	Aux TX Audio	✓		Input from external device
6	Open			Open
7	GND			Station Ground
8	5 VDC Out		✓	+5V dc from Power Supply (1 Amp Max.)
9	Gen TX Data —			Modulation signal from Simulcast equipment (Note 1)
10	PL (+) In	✓		Future Use
11	Aux In 1 (Ext Failsoft)	✓		Customer-defined transistor buffered input (Note 1)
12	Aux In 2 (TX Inhibit)	✓		Customer-defined transistor buffered input (Note 1)
13	Aux In 3 (Ext TX Code Det)	✓		Customer-defined transistor buffered input (Note 1)
14	Aux In 4 (RX WL Inhibit)	✓		Customer-defined transistor buffered input (Note 1)
15	Aux In 5 (Duplex Enable)	✓		Customer-defined transistor buffered input (Note 1)
16	Aux In 6 (In Cabinet Repeat)	✓		Customer-defined transistor buffered input (Note 1)
17	Aux In 7 (Channel 4)	✓		Customer-defined transistor buffered input (Note 1)
18	Aux Out 7 (RD Stat +)		✓	N.O. contact of Relay A (Note 1)
19	Aux Out 8		✓	N.O. contact of Relay B
20	Aux Out 9		✓	N.O. contact of Relay C
21	Aux Out 10		✓	N.O. contact of Relay D
22	Aux In 9 (Ext PTT +)	✓		Opto-isolated customer-defined input (Opto A+)
23	Aux In 10 (Channel 1 +)	✓		Opto-isolated customer-defined input (Opto B+)
24	Aux In 11 (Channel 2 +)	✓		Opto-isolated customer-defined input (Opto C+)
25	Aux In 12 (Channel 3 +)	✓		Opto-isolated customer-defined input (Opto D+)
26	Line 1 —	✓		Customer 4-wire Phone Line Input (Line 1—)
27	Line 2 —	✓	✓	Customer 2-wire Phone Line Input/Output (Line 2—)
28	Line 3 —	✓		Customer 4-wire Phone Line Input (Line 3—)
29	Line 4 —		✓	Customer 4-wire Phone Line Output (Line 4—)
30	Aux RX Audio		✓	Output to external device
31	Open			Open
32	GND			Station Ground
33	14.2 VDC Out		✓	+14.2 V dc from Power Supply (1 Amp Max.)
34	Gen TX Data +			Modulation signal from Simulcast equipment
35	PL (—) In	✓		Future Use
36	Aux Out 1 (Failsoft Ind)		✓	Customer-defined transistor buffered output (Note 1)
37	Aux Out 2 (RX Code Det)		✓	Customer-defined transistor buffered output (Note 1)
38	Aux Out 3		✓	Customer-defined transistor buffered output
39	Aux Out 4		✓	Customer-defined transistor buffered output
40	Aux Out 5		✓	Customer-defined transistor buffered output
41	Aux Out 6		✓	Customer-defined transistor buffered output
42	Aux In 8	✓		Customer-defined transistor buffered input
43	Aux Out 7 (RD Stat —)		✓	N.O. contact of Relay A (Note 1)
44	Aux Out 8		✓	N.O. contact of Relay B
45	Aux Out 9		✓	N.O. contact of Relay C
46	Aux Out 10		✓	N.O. contact of Relay D
47	Aux In 9 (Ext PTT —)	✓		Opto-isolated customer-defined input (Opto A—)
48	Aux In 10 (Channel 1 —)	✓		Opto-isolated customer-defined input (Opto B—)
49	Aux In 11 (Channel 2 —)	✓		Opto-isolated customer-defined input (Opto C—)
50	Aux In 12 (Channel 3 —)	✓		Opto-isolated customer-defined input Opto D—)

Notes:

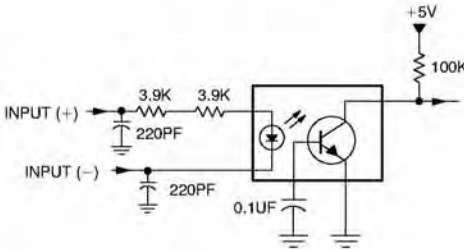
1. Many of the customer-defined inputs and outputs have been preassigned with signal names and functions usually required in typical Trunking and other systems. These default preassignments have been made for customer convenience only, and may be re-assigned as necessary. The preassigned signal names are shown in parentheses in the SIGNAL column. (Reassignment requires the use of the Wildcard Option.)



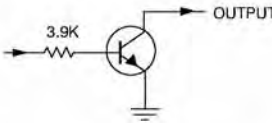
Typical Relay Closure Output Circuit



Typical Transistor-Coupled Input Circuit



Typical Opto-Coupled Input Circuit



Typical Transistor-Coupled Output Circuit

Figure 3. TRN7480A Backplane Rear Connectors Pin-Out Information (Sheet 2 of 3)

J

CONNECTOR #27		PERIPHERAL TRAY INTERFACE			
Pin #	Signal	Input	Output	Function	
1	14.2 V		✓	+14.2 V dc from Power Supply (1 Amp Max.)	
2	GND			Station Ground	
3	ANT RLY KEYED A+		✓	Switched +14.2 V to energize antenna relay (if located in Peripheral Tray)	
4	EXT I/O 2			Future Use	
5	EXT I/O 1		✓	Switched +14.2 V to energize Main/Standby relay	
6	EXT Circ Temp	✓		DC voltage proportional to temperature from sensor mounted on Dual Circulator Module	
7	EXT WM Ref			Ground reference for External Wattmeter	
8	EXT WM Vr	✓		DC voltage proportional to External Wattmeter reflected power	
9	EXT WM Vf	✓		DC voltage proportional to External Wattmeter forward power	
10	GND			Station Ground	

N

CONNECTOR #31		EXTERNAL DC POWER			
Pin #	Signal	Input	Output	Function	
1	GND		✓	Station Ground	
2	Spare			Not Used	
3	Spare			Not Used	
4	Spare			Not Used	
5	Spare			Not Used	
6	+14.2 V		✓	+14.2 V dc @ 1 Amp (if no connection to Connector #17—pin 33)	
7	Spare			Spare	
8	+5 V		✓	+5 V dc @ 1 Amp (if no connection to Connector #17—pin 8)	
9	Spare			Not Used	
10	GND		✓	Station Ground	

K

CONNECTOR #23		ANTENNA RELAY			
Pin #	Signal	Input	Output	Function	
1	GND			Station GND	
2	ANT RLY KEYED A+		✓	Switched +14.2 V to energize antenna relay	
3	GND			Station Gnd	

P

CONNECTOR #22	
ETHERNET PORT	
Accepts 10BASE-2 coaxial cable (via T-connector) for connections to an <i>IntelliRepeater</i> Ethernet network or to download software via a locally connected PC running RSS.	

L

CONNECTOR #50	
AC INPUT	
Connects to 110V/220V AC source via 3—wire line cord.	

M

CONNECTOR #24		BATTERY TEMPERATURE			
Pin #	Signal	Input	Output	Function	
1	GND			Station Ground	
2	BATT TEMP	✓		Variable resistance proportional to battery temperature from sensor near storage batteries	
3	GND			Station Ground	

Q

CONNECTOR #15		MULTI-PURPOSE RS-232			
Pin #	Signal	Input	Output	Function	
1	Shield Gnd		✓	Station Ground	
2	TxD3		✓	Transmit Data	
3	RxD3	✓		Receive Data	
4	RTS3		✓	Request to Send	
5	CTS3	✓		Clear to Send	
6	DSR3	✓		Data Set Ready	
7	Signal Ground			Station Ground	
8	DCD3	✓		Data Carrier Detect	
9	OPEN				
10	OPEN				
11	OPEN				
12	OPEN				
13	Local Loopback 3		✓	Not Used	
14	OPEN				
15	TCLK3		✓	Transmit Clock	
16	OPEN				
17	RCLK	✓		Receive Clock	
18	OPEN				
19	OPEN				
20	DTR3		✓	Data Terminal Ready	
21	OPEN				
22	OPEN				
23	OPEN				
24	OPEN				
25	Remote Loopback 3		✓	Not Used	

Figure 3. TRN7480A Backplane Rear Connectors Pin—Out Information (Sheet 3 of 3)