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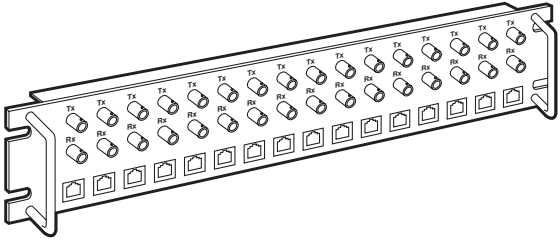
JUNE 1998
MT243A
MT243C-F
RM243A

G.703 Balun Module Panel Unit
G.703 Balun Module
G.703 Balun Chassis



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CE Notice

The CE symbol indicates that the product is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU).

TRADEMARKS USED IN THIS MANUAL

Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

1. Specifications

Data Rate — 2.048 Mbps

Transmission Line — CCITT G.703 (unstructured)

Connections — 75-ohm: Dual coax BNC connectors, female (RG59 or 2002 coax); 120-ohm: Shielded RJ-45 jack

Link-to-Data Isolation — 500 volts AC/DC

Operating Temperature — 32 to 122°F (0 to 50°C)

Power Supply — None required

Size — Without handles, 3.5"H x 19"W x 1.9"D (8.9 x 48.3 x 4.8 cm)

2. Description

2.1 Introduction

The G.703 Balun Module Panels match multiple sets of dual 75-ohm coax connections to multiple 120-ohm twisted-pair connections. This allows carriers to provide 120-ohm G.703 service to customers retaining 75-ohm CPE hardware. It also allows carriers who have standardized on 75-ohm coax to provide 120-ohm terminations to their customers (in keeping with European ONP requirements).

Supporting E1 data rates to 2.048 Mbps, the G.703 Balun Module Panels bi-directionally match not only signal impedance, but also the pulse shapes of the signals according to the CCITT G.703 standard. The panels mount in a standard 19-inch rack and are available with 1 to 16 modules per rack.

2.2 Features

- Connects 75-ohm dual coax to 120-ohm twisted pair.
- Bi-directional signal conversion according to CCITT G.703.
- Data rates up to 2.048 Mbps.
- Low-profile design.
- Mounts in standard 19-inch rack.
- No AC power or batteries required.
- Strap-selectable modular (RJ-45) pinouts.

3. Configuration

Each G.703 Balun Module is equipped with four jumpers that you may use to configure several grounding options. This chapter shows the jumper locations and describes their functions.

There are five configuration jumpers on the back of the Module's printed circuit board. These jumpers are labeled JP1, JP2, JP3, JP4, and JP7. Figure 3-1 shows their positions on the PC board as well as the relative pin numbers on the jumpers.

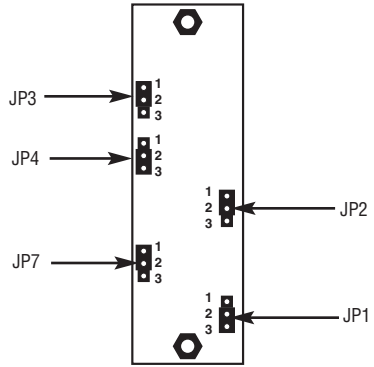


Figure 3-1. Jumper Location.

Figure 3-2 shows the orientation of the rear interface-card straps. Note that the strap can either be on posts 1 and 2, or on posts 2 and 3.

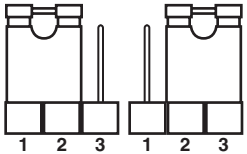


Figure 3-2. Possible Positions for the Jumpers.

The jumper straps allow you to set shielding and grounding options. The settings for each jumper strap are shown in the table below. Following the table are more detailed explanations of each jumper.

Table 3-1. Strap Summary Table

Strap	Function	Position 1&2	Position 2&3
JP1	Coax TX Shield & RJ-45 Pin 3	Open*	Connected
JP2	Coax TX Shield & RJ-45 Shield	Connected*	Open
JP3	Coax RX Shield & RJ-45 Shield	Connected*	Open
JP4	Coax RX Shield & RJ-45 Pin 6	Open*	Connected
JP7	RJ-45 Shield & Chassis Ground	Connected*	Open

*Indicates default setting

Jumper JP1: 75-Ohm TX Shield to 120-Ohm TX Pair Shield (Pin 3)

In the default "Connected" setting, the 75-ohm transmit-out coaxial shield connects to RJ-45 pin 3, the transmit-pair shield.

JP1	Setting	Description
Position 1 & 2	Not Connected	75-ohm TX shield not connected to RJ-45 TX pair shield (Pin 3)
Position 2 & 3	Connected	75-ohm TX shield connected to RJ-45 TX pair shield (Pin 3)

Jumper JP2: 75-Ohm Shield to 120-Ohm Overall Shield

In the default "Connected" setting, the 75-ohm transmit-out coaxial shield connects to the RJ-45 overall foil shield.

JP2	Setting	Description
Position 1 & 2	Connected	75-ohm TX shield connected to the RJ-45 overall foil shield
Position 2 & 3	Not Connected	75-ohm TX shield not connected to the RJ-45 overall foil shield

Jumper JP3: 75-Ohm RX Shield to 120-Ohm Overall Shield

In the default "Connected" setting, the 75-ohm receive-in coaxial shield connects to RJ-45 pin 6, the receive-pair shield.

JP3	Setting	Description
Position 1 & 2	Connected	75-ohm RX shield connected to the RJ-45 overall foil shield
Position 2 & 3	Not Connected	75-ohm RX shield not connected to the RJ-45 overall foil shield

Jumper JP4: 75-Ohm RX Shield to 120-Ohm RX Pair Shield (Pin 6)

In the default "Connected" setting, the 75-ohm coaxial shield connects to the RJ-45 overall foil shield.

JP4	Setting	Description
Position 1 & 2	Not Connected	75-ohm RX shield not connected to the RJ-45 RX pair shield (Pin 6)
Position 2 & 3	Connected	75-ohm RX shield connected to the RJ-45 RX pair shield (Pin 6)

Jumper JP7: RJ-45 Shield to Chassis Ground

In the default "Connected" setting, the RJ-45 overall shield connects to chassis ground.

JP7	Setting	Description
Position 1 & 2	Connected	RJ-45 shield connects to Frame Ground
Position 2 & 3	Not Connected	RJ-45 shield does not connect to Frame Ground

4. Installation

4.1 The G.703 Balun Chassis

The G.703 Balun Chassis can accommodate up to 16 G.703 Balun Modules. Measuring only 3.5" high, the Chassis is designed to occupy only 2U in a 19-inch rack. Sturdy front handles allow the Chassis to be extracted and transported conveniently.

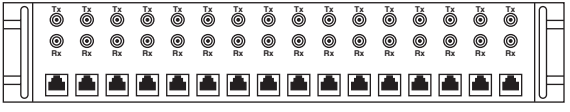


Figure 4-1. The Chassis.

4.2 Installing a Module in the Chassis

The Chassis is made up of a 2U-high rack chassis and individually mountable G.703 Balun Modules. You can purchase a fully populated 16-port rack (part number MT243A) or you may purchase individual modules. Refer to Figure 4-2 as a guide and follow the steps below to install each additional module into the chassis.

1. Slide the two star washers over the screws on each end of the mount space.

2. Slide the G.703 Balun Module PC board over the screws with the BNC connectors facing downward. Then push the BNC connectors an RJ-45 connector through the matching slots in the front of the rack assembly.

3. Slide a plastic spacer over each screw to secure the PC board.

4. Install the Lexan shield over the spacers.

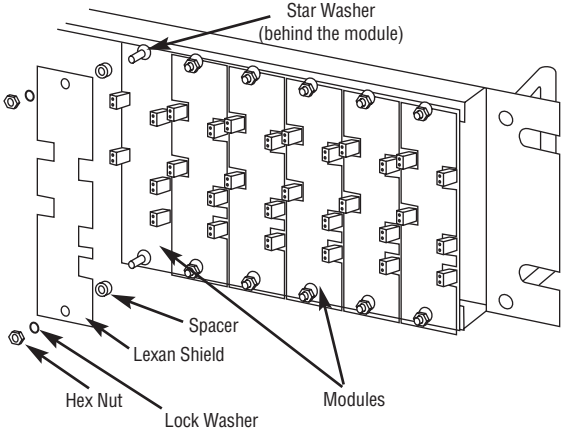


Figure 4-2. Mounting the Module to the Rack.

5. Secure the Module by connecting a lock washer and a hex nut on each screw.

4.3 Connecting the 75-Ohm BNC Ports

The 75-ohm BNC ports on the front of the Chassis are labeled “TX” (Transmit Data Output) and “RX” (Receive Data Input). Simply connect the G.703 lines as follows:

G.703 Network BNC Connector	G.703 Balun Module BNC Connectors
TX	RX
RX	TX

NOTE

The total allowable cable lengths are subject to the constraints of the ITU/CCITT G.703 recommendation. However, we recommend a total patch-cable length, including coaxial and twisted-pair cabling, of no more than 320 feet (200 m).

4.4 Connecting the 120-Ohm RJ-45 Ports

The pin configuration of the 120-ohm twisted-pair port is shown below:

RJ-45 Pins	Function
1	TX Output
2	TX Output
3	TX Shield
4	RX Input
5	RX Input
6	RX Shield
7	No connection
8	No connection

Install the twisted-pair wires by making the following connections:

G.703 Instrument	Module RJ-45 Pin No.
TX Output	4
TX Output	5
TX Shield	3
RX Input	1
RX Input	2
RX Shield	6

NOTE

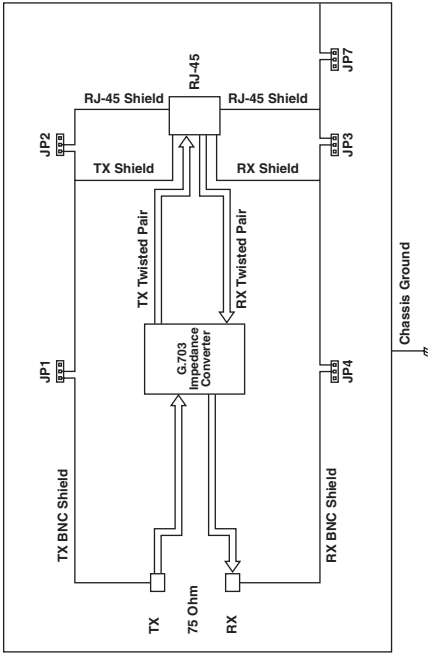
The total allowable cable lengths are subject to the constraints of the ITU/CCITT G.703 recommendation. However, we recommend a total patch cable length, including coaxial and twisted-pair cabling, of no more than 320 feet (200 m).

Appendix A: Pin Assignments

120-Ohm Twisted-Pair Interface

RJ-45 Jack	Pin No./Signal
	1- Transmit Data Out 2- Transmit Data Out 3- Transmit Data Shield 4- Receive Data In 5- Receive Data In 6- Receive Data Shield 7- no connection 8- no connection

Appendix B: Block Diagram



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