L MULTIPLEX TERMINALS
COMMON EQUIPMENT
C3 SUPERGROUP CONNECTOR
DESCRIPTION

CONTENTS PAGE

1. INTRODUCTION

1.01 A supergroup connector is a one-way circuit used to connect the output of an L multiplex supergroup demodulator to the input of an L multiplex supergroup modulator. It enables the retransmission of an entire supergroup (60 channels between 312 and 552 kHz) without using additional multiplex equipment. Without a supergroup connector, each channel in the supergroup would have to be translated to voice frequency before retransmission could be effected. Three generations of L multiplex supergroup connectors are available. This section describes the C3 supergroup connector. Information on earlier designs, designated C1 and C2, can be found in Section 356-025-100.

1.02 Whenever this section is reissued, the reasons for reissue will be listed in this paragraph.

1.03 The C3 supergroup connector is designed for general application in the LMX plant and can be used with all vintages of LMX equipment. It provides filtering to remove signals outside the 312- to 552-kHz band and to block pilots or other energy at 308 and 556 kHz that may be present from connected systems. The C3 connector also provides adjustable gain to maintain proper transmission levels, equalization to compensate for amplitude distortion, and on an optional basis, delay equalization. The connector is coded as apparatus and is available in two configurations:

- 4250A—The basic C3 connector
- 4250B—The basic C3 connector equipped with delay equalization

In both configurations the components are assembled in a single plug-in unit (Fig. 1) which can be inserted into a connector shelf designed for its use.

2. CIRCUIT DESCRIPTION

2.01 The two configurations of the C3 supergroup connector are shown in simplified schematic form in Fig. 2. The 4250A configuration consists of a pad, a bandpass filter (which includes 308- and 556-kHz blocking sections), a gain and amplitude equalization circuit, and a hybrid network. The 4250B connector has a delay equalizer instead of the pad, but otherwise is identical.

2.02 The input signal to the C3 connector comes from a receiving supergroup distribution frame or LMX bay at a nominal −28.6 dBTLP. In the 4250A configuration the signal is applied first to a 3.5-dB pad (or equivalent delay equalizer in the 4250B supergroup connector). The 4250B connector is required whenever supergroup wideband data is to be transmitted. Data signals are impaired by delay distortion (i.e., distorted waveforms caused by the difference in arrival time of the frequencies which make up the waveform). The delay equalizer in the 4250B connector corrects this problem.

2.03 The 1106A filter used in the connector passes frequencies between 312 and 552 kHz with a flat loss of approximately 12 dB (the insertion loss is shown in Fig. 3). It also suppresses previous line or terminal pilots, or other energy at 308 and 556 kHz to enable reuse of these frequency slots.

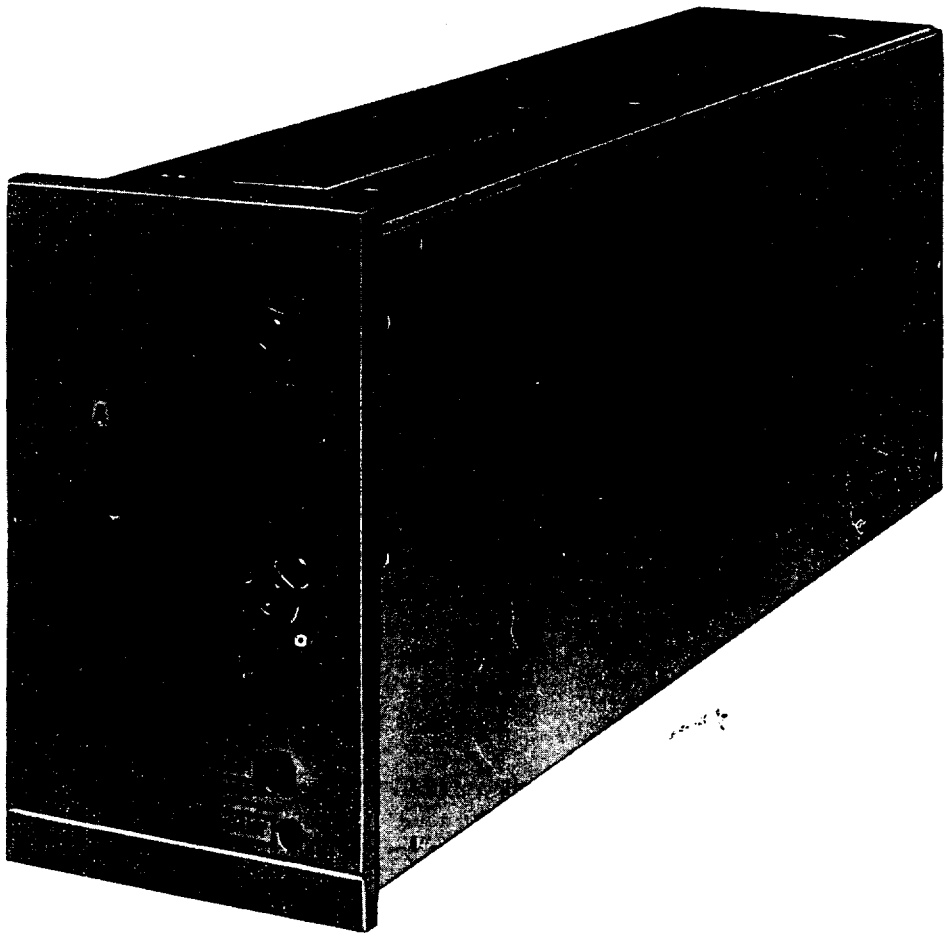

Fig. 1—C3 Supergroup Connector

2.04 The output of the filter network is applied to a 978A network which contains amplitude equalization and amplification. The amplifiers provide 28 to 33 dB of variable gain to compensate for loss variations in the connector and in input cable. The gain is adjusted by a GAIN ADJ control which can be accessed from the connector front panel. The hybrid transformer at the output of the connector provides a test jack that can be used on an in-service basis without affecting transmission.

2.05 The power regulator (see Fig. 2) included in the C3 plug-in unit and a passive filter in the associated bay fuse panel are interdependent. Together, they provide the battery voltage, regulation, and filtering required by the connector amplifier.

2.06 Amplitude distortion, introduced by supergroup bandpass filters in preceding LMX transmitting and receiving circuits, is cumulative and therefore prevents more than two supergroup connectors from being placed in tandem unless equalization or frequency frogging is performed. The amplitude equalizer compensates for amplitude distortion by equalizing signal amplitude across the basic supergroup band. The equalization enables up to four supergroup connectors to be placed in tandem.

2.07 The trunk adjust attenuator (see Fig. 2) builds out the transmitting cable loss to a standard value. This enables a specific transmission level at the C3 test jack.

3. EQUIPMENT DESCRIPTION

3.01 The C3 connectors are 6 inches high, 3.5 inches wide, and 15 inches long. The 4250A

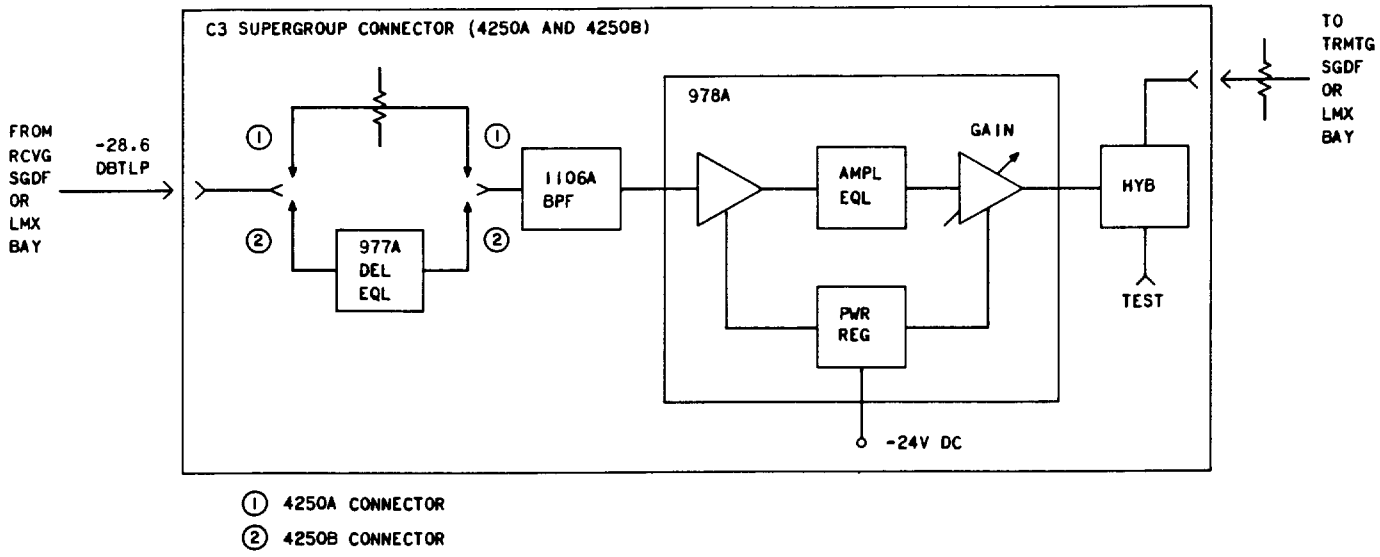

Fig. 2—C3 Supergroup Connector, Simplified Diagram

configuration weighs approximately 5 pounds, while the 4250B connector weighs approximately 7 pounds.

3.02 The C3 connectors are plug-in units and mount into shelves designed for their use. The shelves, which contain positions for up to six supergroup connectors, have blue ribbon connectors, trunk adjust potentiometers, and wiring at the rear of the shelf. Interbay connections are made by miniature coaxial jacks which are shop-wired to the blue ribbon connector and the potentiometer. Installation connections consist of patching into the coaxial jacks and connecting battery to the blue ribbon connector. The potentiometers, which provide buildout for the output cable, are adjusted at the time of installation.

3.03 The shelf can be miscellaneously mounted or used in a C3 Supergroup Connector Bay (J68941M). This bay, provided specifically for C3 connectors, is 7 feet high, 23 inches wide, and 18 inches deep. It can be equipped with 12 shelves and has a capacity of 72 one-way supergroup connectors. Power for the connectors is applied via a fuse panel located at the top of the bay. The panel contains a fuse alarm circuit with provision for connections to local and remote alarm equipment. A line drawing of the supergroup connector bay is shown in Fig. 4.

4. REFERENCES

4.01 The following reference material provides additional information.

Schematic Drawings

SECTION	TITLE
SD-50718-01	Supergroup Distribution Frame
SD-51597-01	C3 Supergroup Connector, Application Schematic

Bell System Practices

356-005-100	Group, Supergroup, and Mastergroup Distribution Frames, Description
356-005-000	Task Oriented Practice (TOP)
804-640-162	LMX-3 System Specification (J68941)

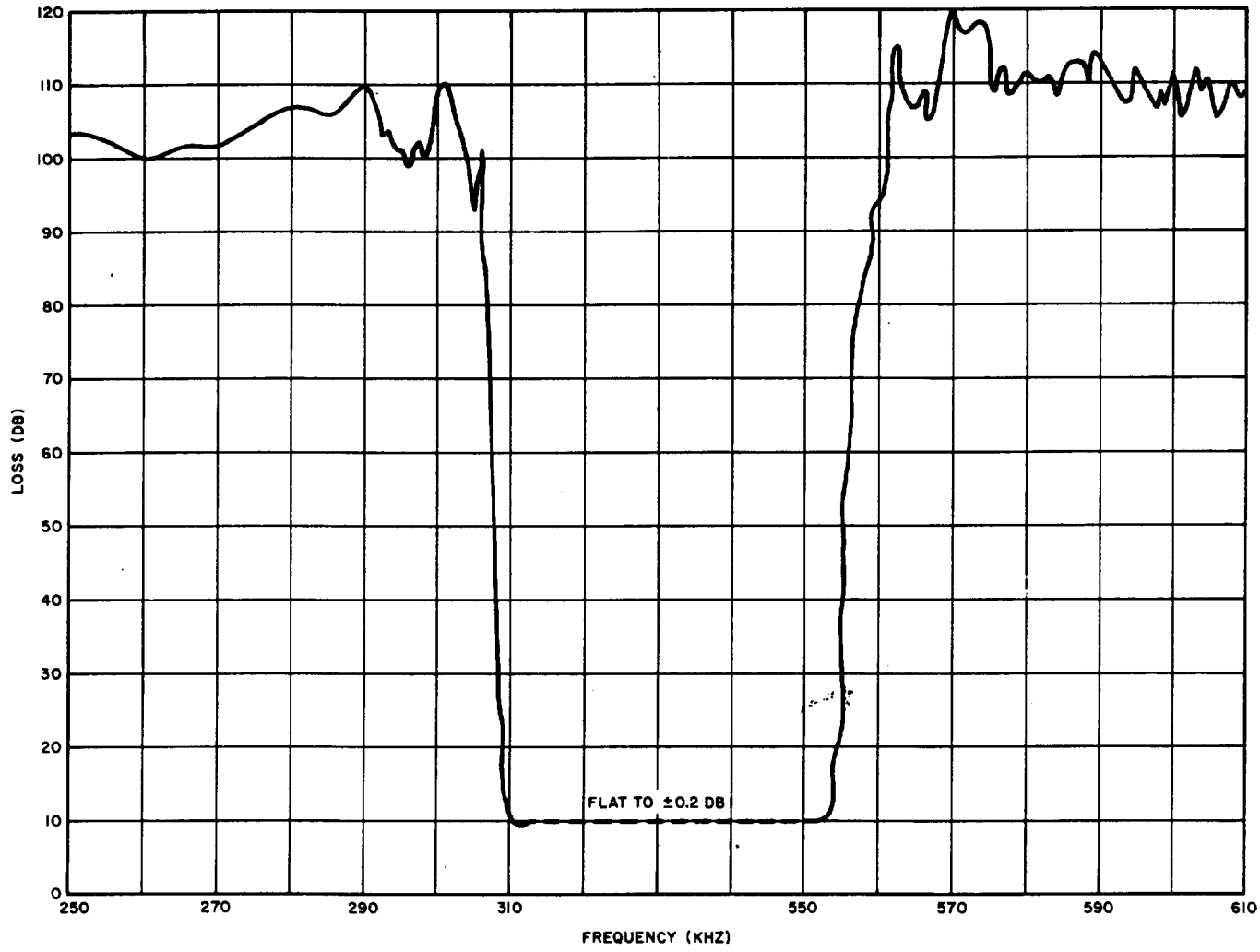

Fig. 3—4250( ) C3 Supergroup Connector, Typical Loss Characteristic

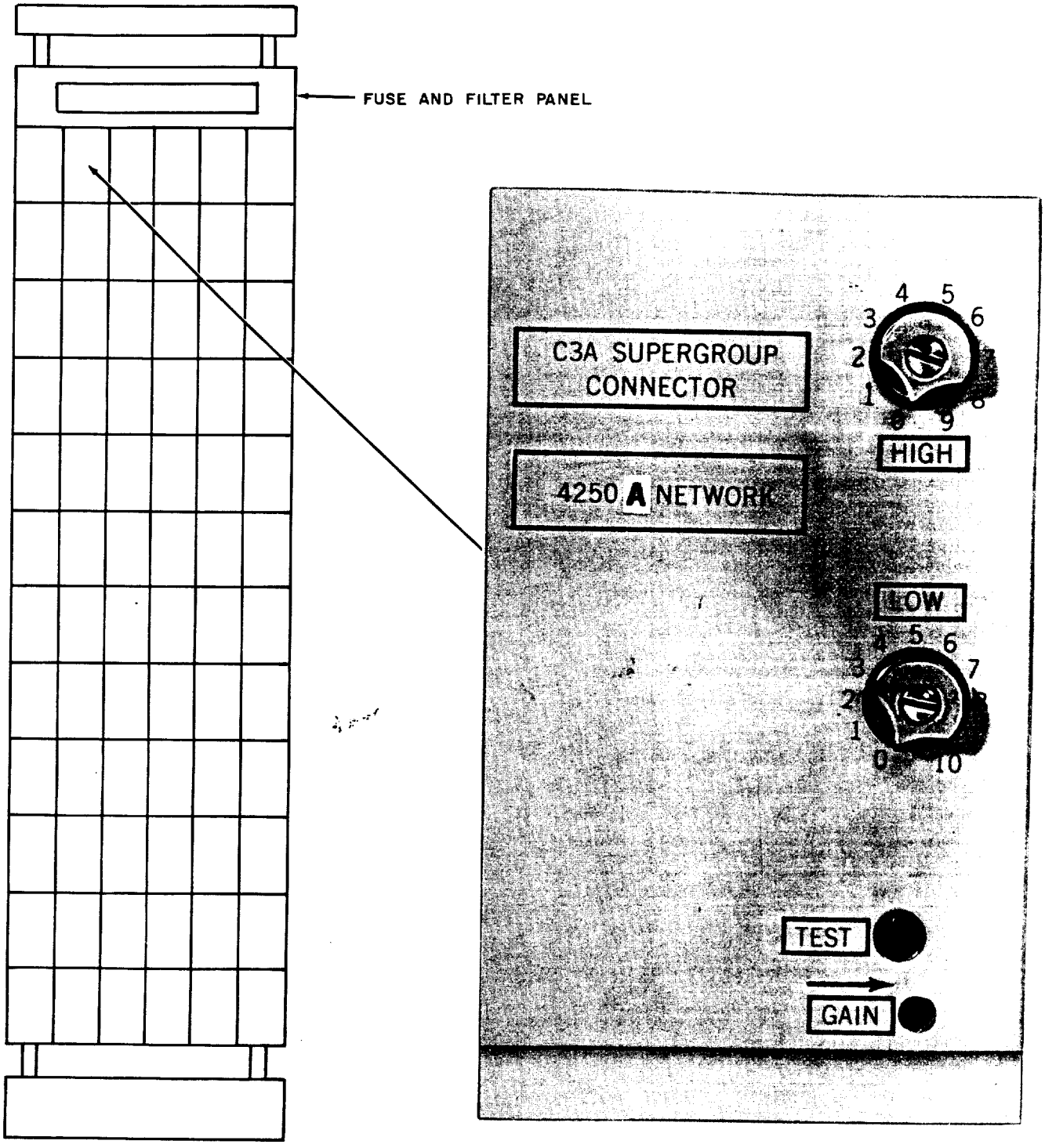

Fig. 4—C3 Supergroup Connector Bay (J68941M) and Typical Shelf Installation