837D AND J99380AA
IMPEDANCE COMPENSATOR NETWORKS
DESCRIPTION

CONTENTS PAGE

1. INTRODUCTION

1.01 This section describes the 837D and the J99380AA impedance compensator networks. The J99380AA is a circuit pack which is electrically identical to two separate 837D networks.

1.02 This section is reissued to include the new J99380AA circuit pack which is part of the Customer Premises Facility Terminal (CPFT) family. Due to extensive changes in this section, change arrows normally used have been omitted.

1.03 These networks are used at the customer premise end (normally a PBX) of circuits requiring terminal balance. The networks are inserted between the facility, either 22-, 24-, or 26-gauge nonloaded cable, and the customer equipment. The networks match the impedance of the facility to the equipment and furnish loss equalization in the voice frequency band. Because of the additional insertion loss of the networks, typically 3 to 4 dB at 1 kHz, 2-wire repeaters, eg, the E6 or MFT 2-2, are usually required.

1.04 The echo return loss (ERL) at the central office, when measured against a 900-ohm standard impedance, will be in excess of 20 dB when:

(a) The J99380AA or 837D network at the PBX end is properly adjusted and terminated in 600 or 900 ohms.

(b) The E6 repeater, equipped with an 830C network, or the Metallic Facility Terminal (MFT) 2-2 repeater at the central office is properly adjusted.

The ERL at the PBX with the central office end terminated in 900 ohms will be in excess of the 22-dB terminal balance requirement when measured against a 600- or 900-ohm impedance.

1.05 The J99380AA circuit pack was designed to replace the 837D network. Being of plug-in design instead of hard wired, the J99380AA circuit pack affords increased flexibility and better use of mounting space.

2. EQUIPMENT DESCRIPTION

A. 837D Network

2.01 The 837D network components are mounted in an aluminum can which is approximately 1.7 inches wide, 3.3 inches high and 4.3 inches deep.

2.02 The 837D network is mounted on a mounting plate or panel such as the J99380B mounting panel and connections are made directly on the rear of the network.

2.03 The front of the network (Fig. 1) contains eight screw type switches, a potentiometer, and a 239C test jack.

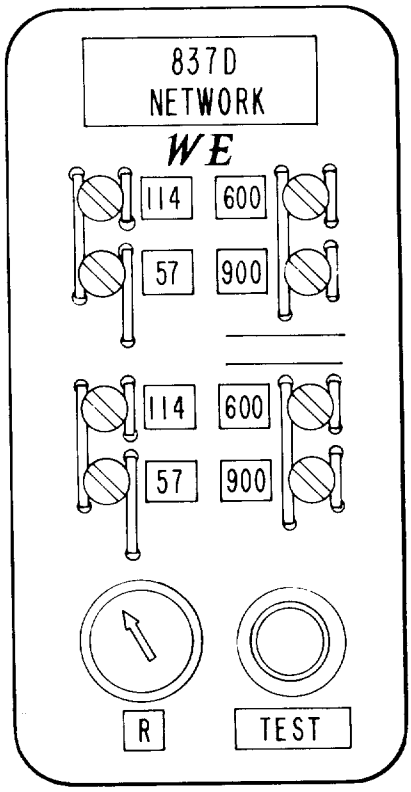


Fig. 1—837D Network

B. J99380AA Network

2.04 The J99380AA impedance compensating network circuit packs are mounted on 8-inch by 6-inch KTU format printed wiring boards with two circuits per board, designated 0 and 1.

2.05 These plug-in units (Fig. 2) have a potentiometer and a test jack for each circuit on the faceplate. Eight screw type switches for each circuit are mounted on the printed wiring board.

2.06 The J99380AA plug-in circuit packs are designed to be mounted in standard KTU mountings or the J99380C mounting shelf described in Section 332-610-100.

3. CIRCUIT DESCRIPTION

3.01 The 837D network is electrically identical to one half of the J99380AA circuit pack. Figure 3 is a schematic drawing of the 837D network or one half of the J99380AA network.

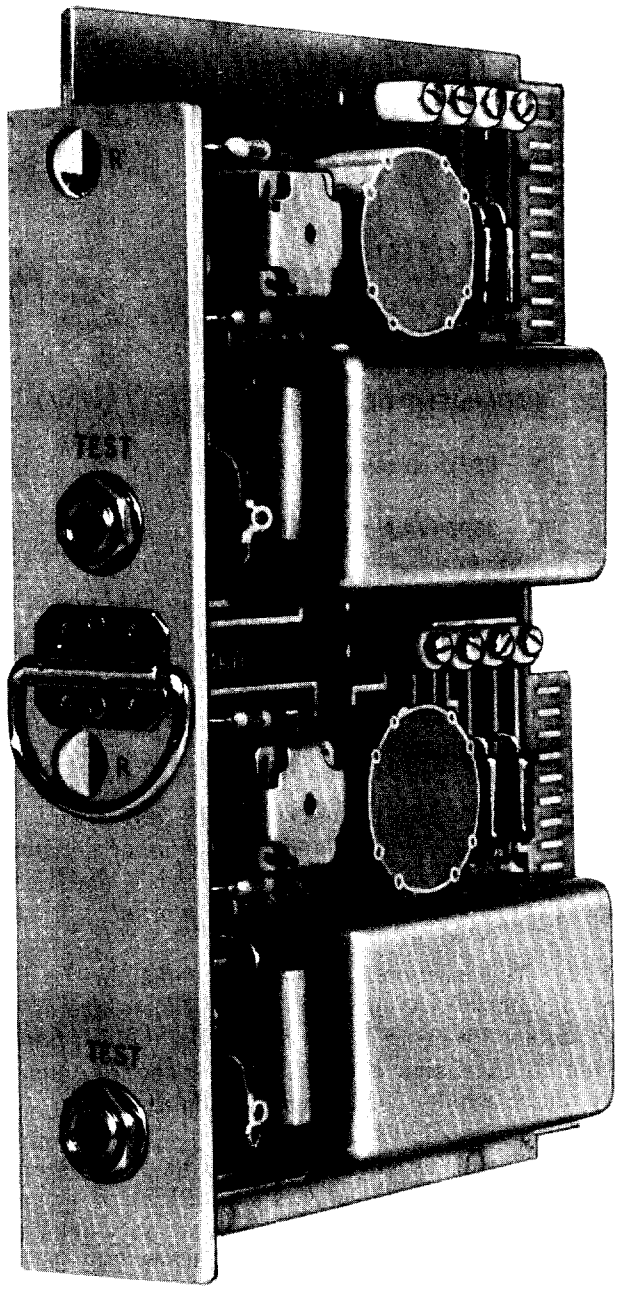
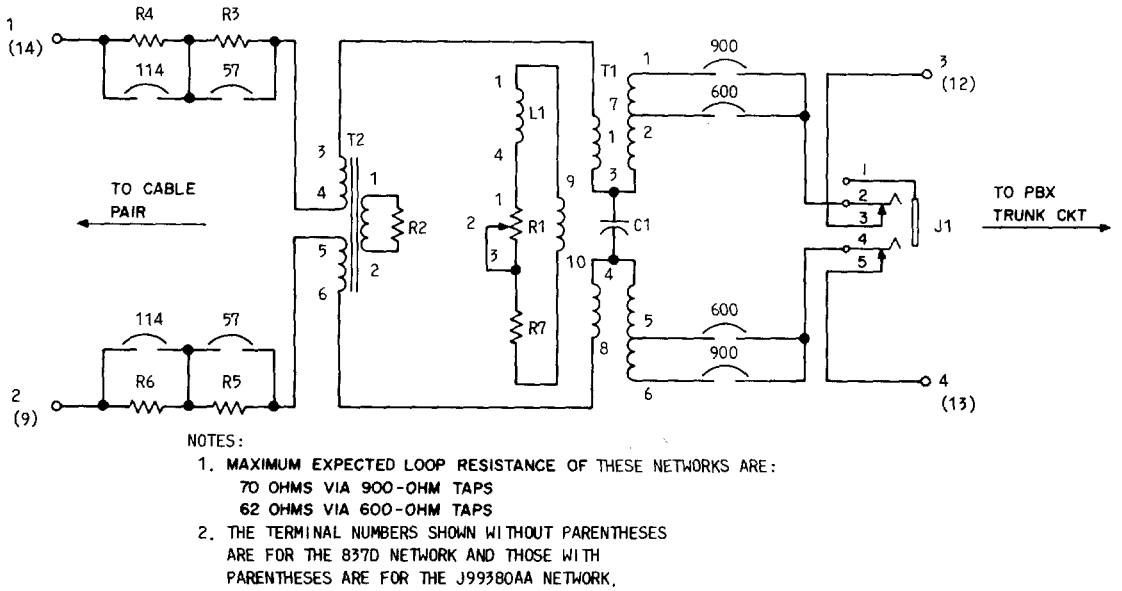


Fig. 2—J99380AA Network

3.02 Terminals 1(14) and 2(9) are on the line side of the network and are connected to the nonloaded 22-, 24-, or 26-gauge cable pair. Terminals 3(12) and 4(13) are on the station side of the network and are connected to the terminating equipment.

3.03 When the loop resistance is too low and dial pulse errors result, building out resistors



NOTES:
1. MAXIMUM EXPECTED LOOP RESISTANCE OF THESE NETWORKS ARE:
   70 OHMS VIA 900-OHM TAPS
   62 OHMS VIA 600-OHM TAPS
2. THE TERMINAL NUMBERS SHOWN WITHOUT PARENTHESES ARE FOR THE 837D NETWORK AND THOSE WITH PARENTHESES ARE FOR THE J99380AA NETWORK.

Fig. 3—Schematic Drawing-837D or One-Half of J99380AA Impedance Compensator Network

(BOR) R3, R4, R5, and R6 are available to add resistance to the loop. Resistors R3 and R4 are in series with the tip lead and are controlled by one set of screw switches designated 57 and 114, respectively. Resistors R5 and R6 are in series with the ring lead and are controlled by the second set of switches designated 57 and 114. Tightening the screws shorts out or removes the associated resistors from the circuit.

3.04 The network introduces a loss of approximately 4.0 dB at the lower frequencies and loss decreases appreciably as the frequency approaches 3200 Hz. This is due to the resistance-inductance (RL) impedance of inductor L1, adjustable R1 and R7 connected across the 9 - 10 winding of transformer T1. The adjustable resistor R1 permits fine adjustment of the network for optimum return loss as measured at the TEST jack.

3.05 Transformer T2 and resistor R2 on the cable side of the network improve the singing margin at frequencies above 6000 Hz.

3.06 Tapped transformer T1, L1, R1, and R7 match the cable impedance to the 600 ohm +2.15-μF or 900 ohm +2.15-μF station equipment. The proper termination impedance is selected by closing the two 600 switches or the two 900 switches.

4. REFERENCES

4.01 The following documents contain additional information pertaining to the J99380AA impedance compensator network and the 837D network.

SECTION	TITLE
332-205-100	Impedance Compensators—Description
332-205-500	Impedance Compensators—Tests and Adjustments
332-206-254	J99380AA Network and 837D Network—Installation and Initial Settings
332-610-100	Customer Premises Facility Terminal—Description
332-610-200	Customer Premises Facility Terminal—Installation

SECTION	TITLE
332-610-500	Customer Premises Facility Terminal—Tests and Adjustments
SD-, CD-97054-01	837-Type Impedance Compensators
SD-, CD-7C010-01 (CPS 1)	Customer Premises Facility Terminal (J99380AA Circuit Pack)