DUAL 2-WIRE IMPEDANCE COMPENSATION NETWORKS

J99343BL, BM, AND BN

DESCRIPTION

METALLIC FACILITY TERMINAL

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1. GENERAL

1.01 This section provides a physical description and discusses the basic functions of the 2-wire dual impedance compensation networks. The individual units are described in detail, and transmission performance, typical applications, and maintenance philosophy are also discussed.

1.02 Whenever this section is reissued, the reason(s) for reissue will be given in this paragraph.

1.03 The metallic facility terminal (MFT) is a standard equipment arrangement for providing various transmission and/or signaling functions that may be required by metallic facilities. The dual 2-wire impedance compensation networks are MFT plug-ins that consist of a component board held by either a die-cast aluminum or molded polycarbonate frame. The MFT unit measures 1-11/16 inches wide, 7-7/8 inches high, and 9 inches deep.

1.04 These units can be used in either a single- or double-module mounting arrangement. They can be mounted in any slot of a single-module shelf or in the transmission slot of a double-module shelf. In double-module applications, the companion signaling unit slot must be vacant. Section 332-910-101 contains additional information on MFT mounting arrangements.

1.05 The dual 2-wire impedance compensation networks are the J99343BL, BM, and BN. These networks are electrically equivalent to the J99380AA, AB, and AC impedance compensators, respectively. The J99343BL, BM, and BN networks match the impedance of the facility to the equipment and provide loss equalization in the voice frequency band.

1.06 The J99343BL, BM, and BN impedance compensation networks can be used in any MFT

mounting arrangement. They are especially appropriate for the new J99400 Packaged Metallic Facility Terminal Assemblies (PMFTA) frame arrangement for use at the special services network interface. Existing Customer Premises Facility Terminal (CPFT) frames also will accept these units.

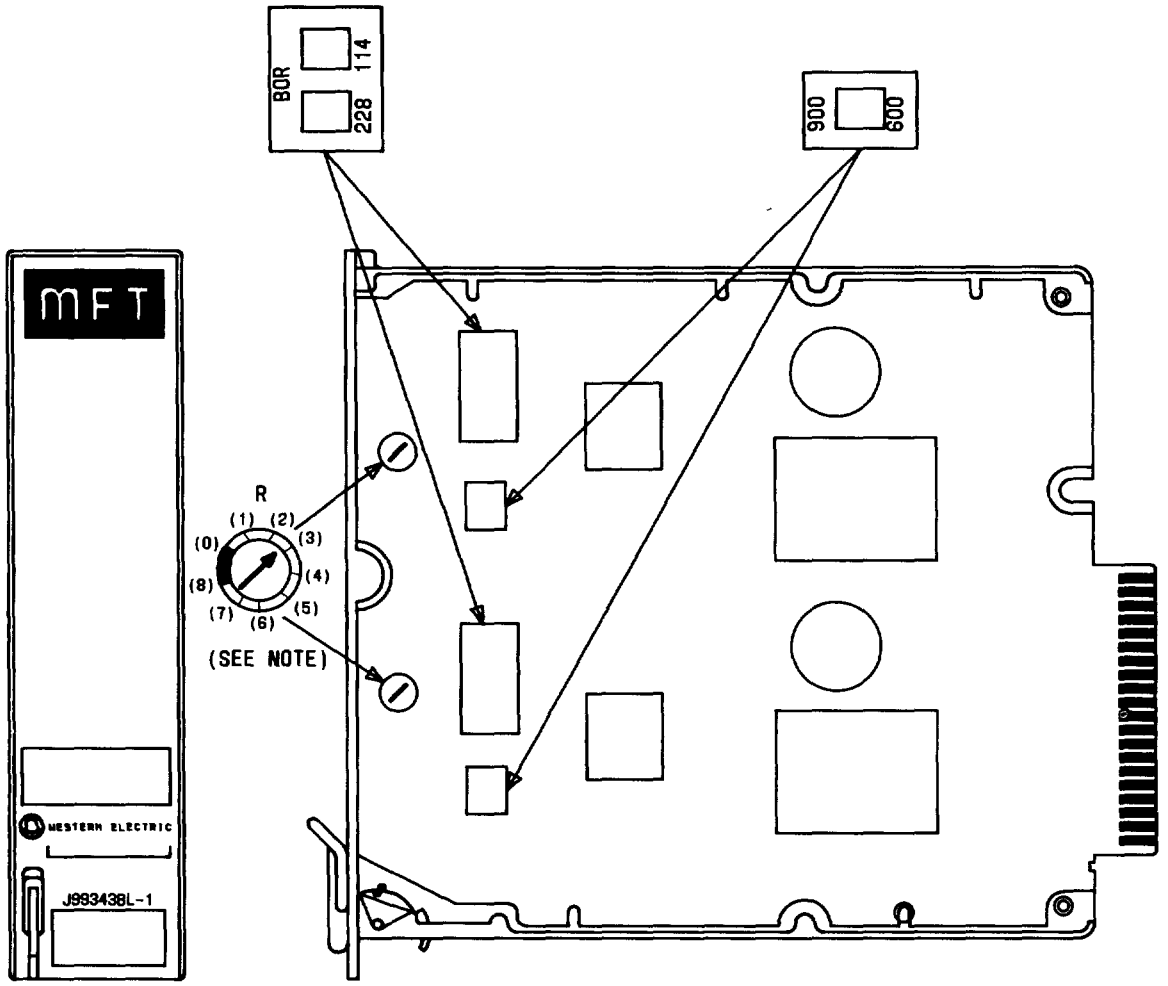
2. FUNCTIONAL DESCRIPTION, J99343BL

2.01 The J99343BL provides impedance matching between 22-, 24-, and 26-gauge nonloaded facilities and 600- or 900-ohm equipment. It also provides loss equalization in the voice frequency (VF) band. The J99343BL is electrically identical to the J99380AA impedance compensator, but some physical improvements have been made. The screw switches on the J99380AA have been replaced by rocker-type dual in-line package (DIP) switches. Also, the test jack on the J99380AA has been eliminated because this test access point is available on the MFT test extenders. The component layout for the J99343BL is shown in Fig. 1. Figure 2 shows a block diagram of the J99343BL.

A. Operation

Build-Out Resistance

2.02 The cable pair side of the impedance compensation circuit interfaces with either 22-, 24-, or 26-gauge nonloaded facilities. Switch selectable build-out resistors (BOR) are provided to add loop



NOTE: THE POSITION NUMBERS (0-8) ARE NOT PRINTED ON THE UNIT.

Fig. 1—Component Layout, J99343BL

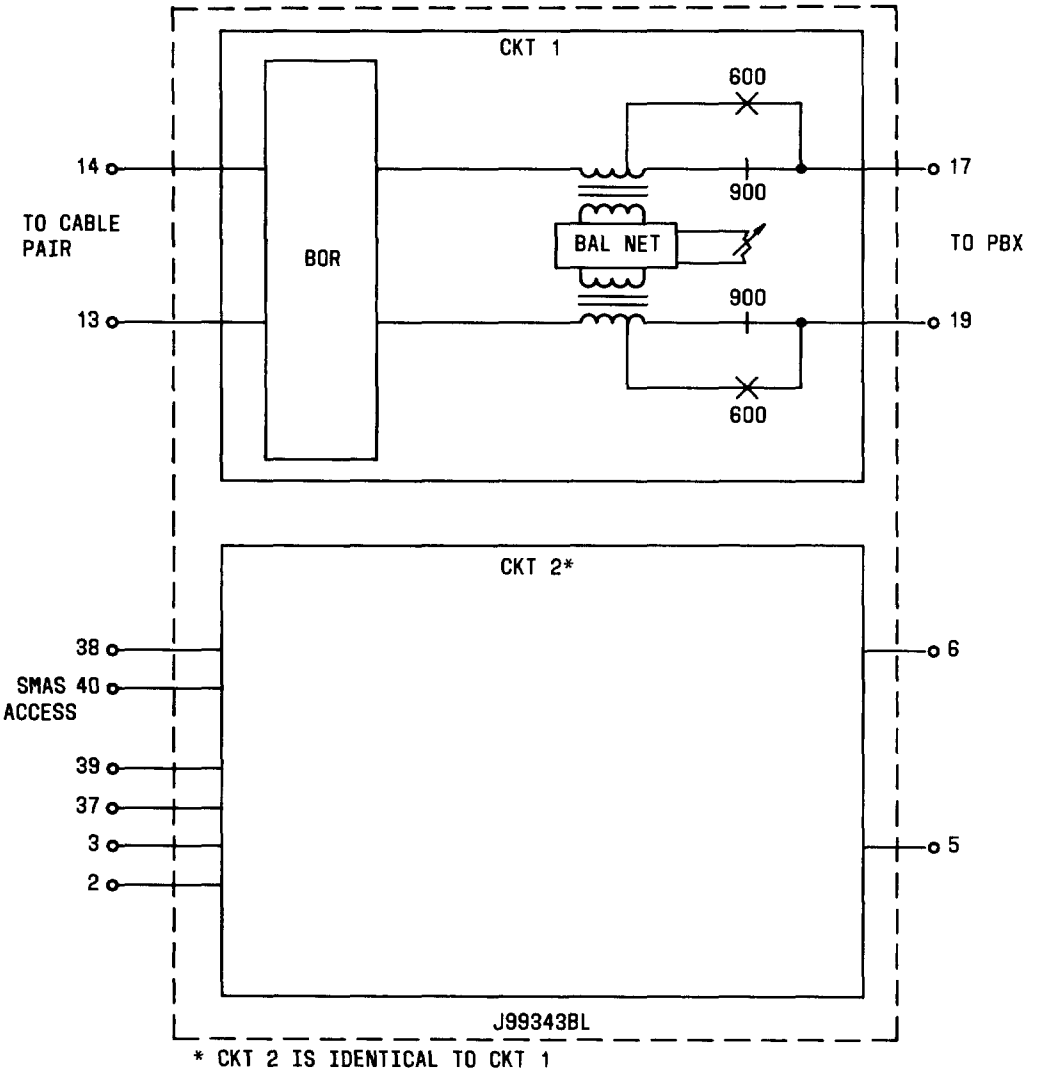


Fig. 2—Block Diagram, J99343BL

resistance when the loop resistance is too low and dial pulse errors may occur.

Balance Network

2.03 The J99343BL contains two identical impedance compensation circuits as shown in Fig. 2. The equipment side of the circuit interfaces with the 600- or 900-ohm terminating equipment. Switches are provided to select either 600- or 900-ohm terminating impedance.

2.04 The balance circuit provides a fine adjustment of the network by using a potentiometer. The potentiometer adjusts the balance circuit to achieve optimum return loss. The potentiometer dial is labeled R.

B. Unit Controls

BOR Switches

2.05 The BOR switch is a set of two rockers located on the printed wiring board (PWB) and labeled 114 and 228. The switches are operated when depressed toward the numerical designation. The switch located in the upper portion of the PWB is for

circuit 1, and the switch in the lower portion is for circuit 2.

600/900 Switches

2.06 The 600/900 switch is a rocker switch located on the PWB. It is operated by depressing the switch toward the desired impedance. The 600/900 switch located in the upper portion of the PWB is for circuit 1, and the switch in the lower portion is for circuit 2.

2.07 The R potentiometer does not have the numerical graduations (0-8) labeled. The setting 0 is the maximum counterclockwise position, and the setting 8 is the maximum clockwise position. Settings 1 through 7 must be estimated.

3. FUNCTIONAL DESCRIPTION, J99343BM

3.01 The J99343BM provides impedance matching between 19-, 22-, and 24-gauge loaded (H88 or D88) facilities and 600-ohm equipment. It also provides loss equalization in the VF band. The J99343BM is electrically identical to the J99380AB impedance compensator, but some physical improvements have been made. The screw switches on the J99380AB have been replaced by rocker-type DIP switches. Also, the test jack on the J99380AB has been eliminated because this test access point is available on the MFT test extenders. The component layout for the J99343BM is shown in Fig. 3. Figure 4 shows a block diagram of the J99343BM.

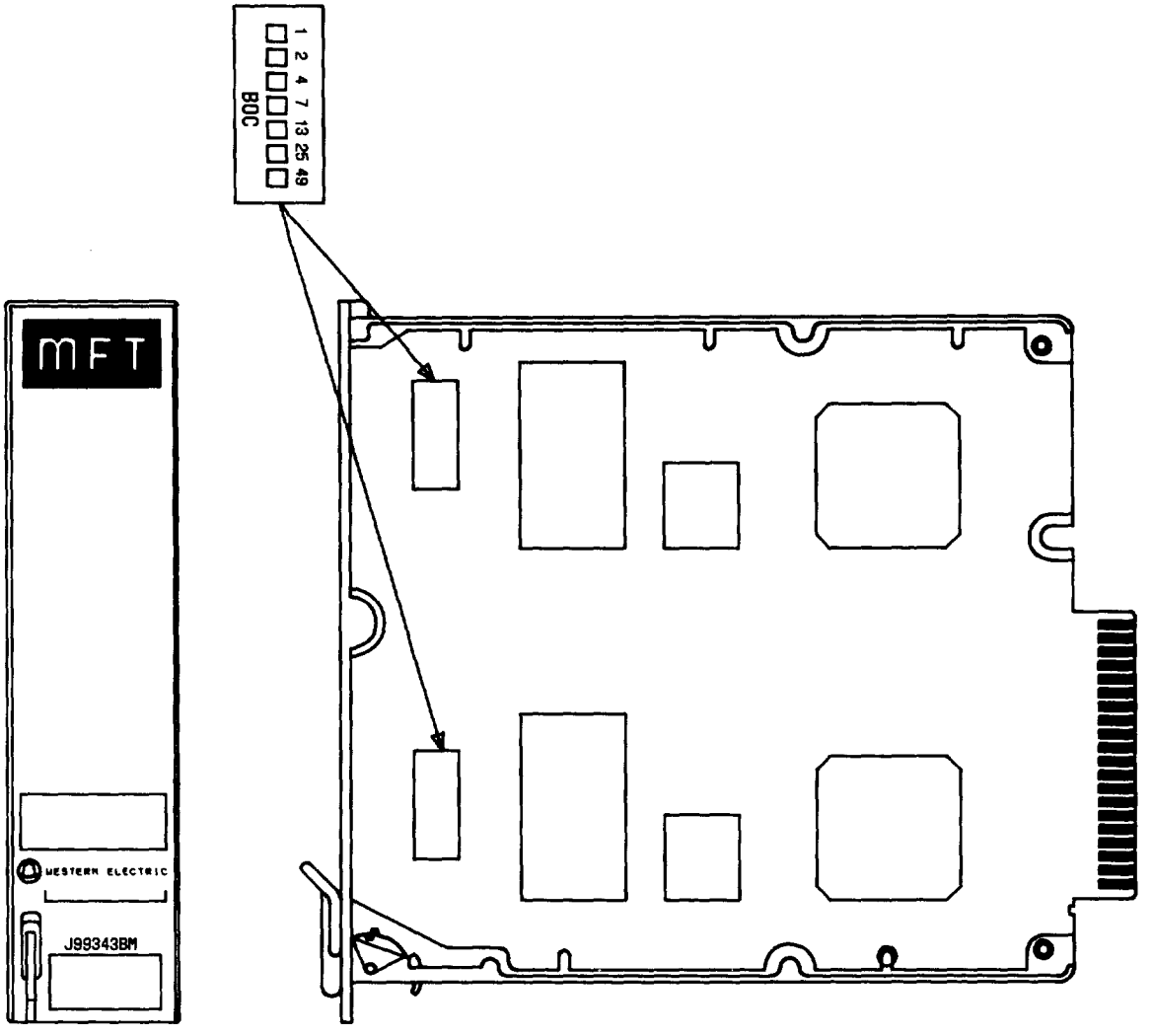


Fig. 3—Component Layout, J99343BM

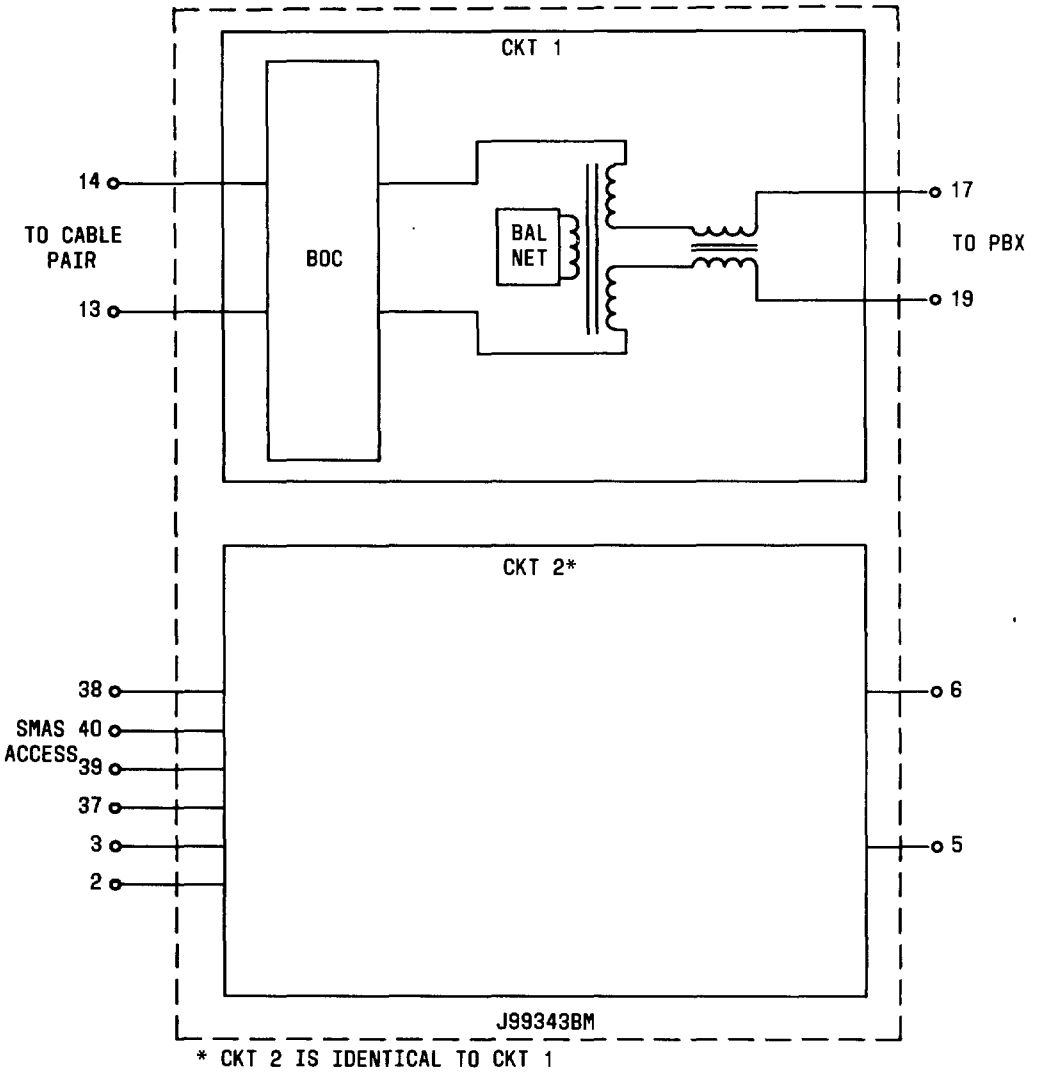


Fig. 4—Block Diagram, J99343BM

A. Operation

Build-Out Capacitance

3.02 The cable pair side of the impedance compensation circuit interfaces 19-, 22-, or 24-gauge H88 or D88 loaded facilities. Switch selectable build-out capacitors (BOC) are provided to build out any end section to a full end section of 6 kft.

Balance Network

3.03 The J99343BM contains two identical impedance compensation circuits as shown in Fig. 4. The equipment side of the circuit interfaces the 600-ohm equipment. The J99343BM introduces a loss of about 0.5 dB at 1 kHz.

B. Unit Controls

BOC Switches

3.04 The BOC switch is a set of seven rockers located on the PWB and labeled 1, 2, 4, 7, 13, 25, and 49. These numbers represent capacitance values in thousandths of microfarads (1 represents 0.001 μF; 49 represents 0.049 μF). The rockers are operated when depressed toward the numerical designation. The rocker switches are additive; therefore, the total value of the rockers operated is the value of capacitance inserted. For example, if rockers 1, 4, and 25 are operated, the total is 30 and the capacitance inserted

into the circuit is 0.030 μF. The set of switches located in the upper portion of the PWB is for circuit 1, and the set of switches in the lower portion is for circuit 2.

4. FUNCTIONAL DESCRIPTION, J99343BN

4.01 The J99343BN provides impedance matching between 26-gauge H88 loaded facility and 600-ohm equipment. It also provides loss equalization in the VF band. The J99343BN is electrically identical to the J99380AC impedance compensator, but some physical improvements have been made. The screw switches on the J99380AC have been replaced by rocker-type DIP switches. The test jack on the J99380AC has been eliminated because this test access point is available on the MFT test extenders. A monitor jack also is provided on this unit. The component layout for the J99343BN is shown in Fig. 5. Figure 6 shows a block diagram of the J99343BN.

A. Operation

Build-Out Resistance

4.02 A switch selectable BOR section is provided to add loop resistance when the loop resistance is too low and dial pulse errors may occur.

Build-Out Capacitance

4.03 The cable pair side of the impedance compensation circuit interfaces 26-gauge H88 loaded facilities. A switch selectable BOC section is provided to build out to an additional 0 to 3 kft of end station. The BOC and the lattice network are additive and can be used to build out to a full 6 kft end section.

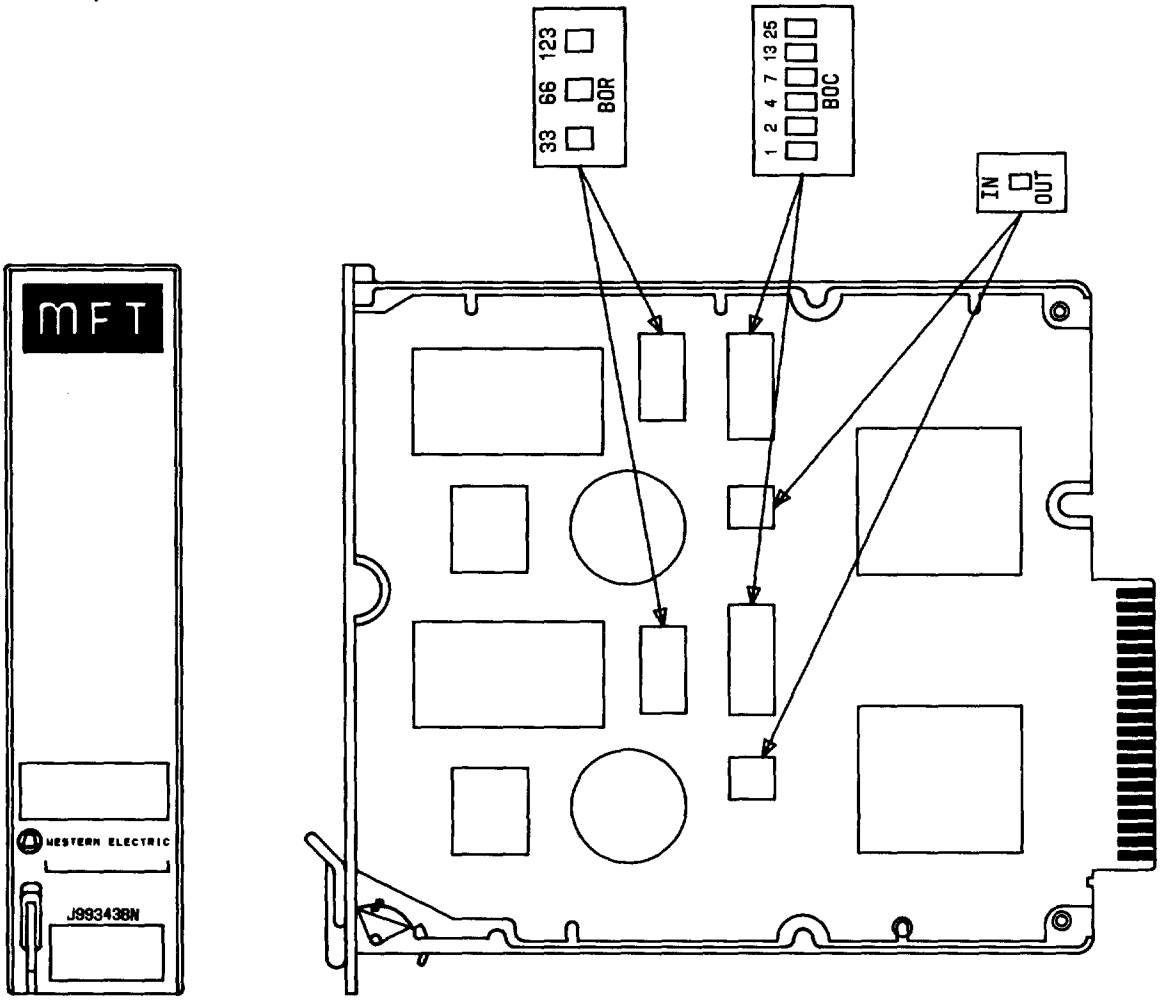


Fig. 5—Component Layout, J99343BN

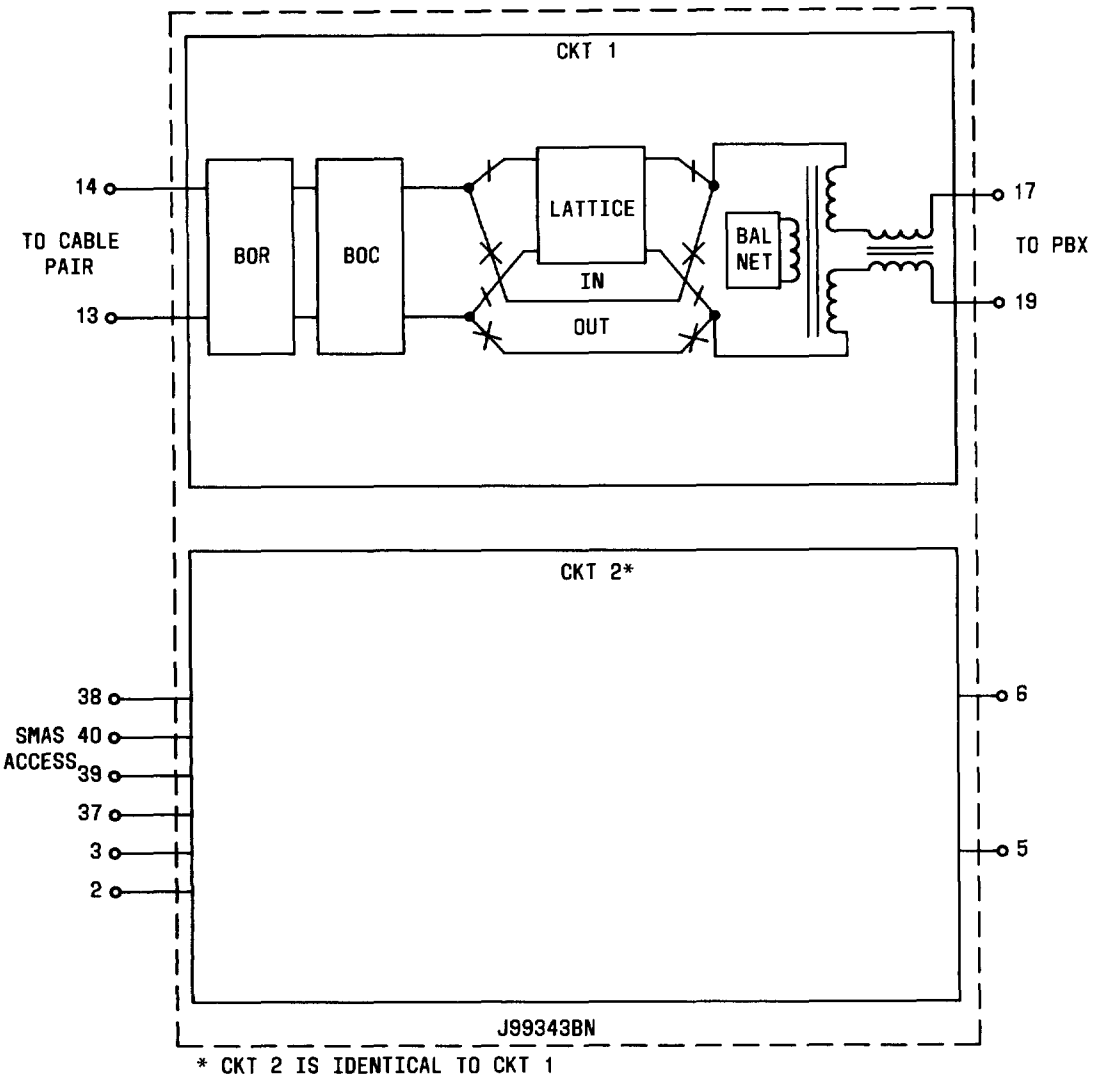


Fig. 6—Block Diagram, J99343BN

Lattice Network

4.04 The lattice network represents a fixed amount of impedance. It is the equivalent to the impedance of 3 kft of 26-gauge H88 loaded cable.

Balance Network

4.05 The J99343BN contains two identical impedance compensation circuits as shown in Fig. 6. The equipment side of the circuit interfaces the 600-ohm terminating equipment.

B. Unit Controls

BOR Switches

4.06 The BOR switch is a set of three rockers located on the PWB and labeled 33, 66, and 132. The switches are operated when depressed toward the numerical designation. The sum of the rocker switches operated is the resistance inserted by the BOR. The switch located in the upper portion of the PWB is for circuit 1, and the switch in the lower portion is for circuit 2.

BOC Controls

4.07 The BOC controls are a set of six rockers located on the PWB and labeled 1, 2, 4, 7, 13, and 25. These numbers represent capacitance values in thousandths of microfarads (1 represents 0.001 μF; 25 represents 0.025 μF). The rockers are operated when depressed toward the numerical designation. The rocker switches are additive; therefore, the total value of the rockers operated is the value of capacitance inserted. For example, if rockers 1, 4, and 25 are operated, the total is 30 and the capacitance inserted into the circuit is 0.030 μF. The set of controls located in the upper portion of the PWB is for circuit 1, and the set of controls in the lower portion is for circuit 2.

Lattice Network Controls (IN, OUT)

4.08 The lattice network is controlled by a single rocker on the PWB labeled IN and OUT. With the rocker depressed toward IN, the equivalent of 3 kft of 26-gauge cable is added into the circuit. With the rocker depressed toward OUT, the 3 kft is taken out of the circuit. The switch in the upper portion of the PWB is for circuit 1, and the switch in the lower portion is for circuit 2.

5. SIGNALING AND LEAD PLAN FEATURES

A. Signaling

5.01 The J99343BL, BM, and BN provide no signaling access leads. DC signaling is passed through the impedance compensation networks.

B. Lead Plan

5.02 The J99343BL, BM, and BN contain two impedance compensation circuits per plug-in. The lead plan follows that of the dual 2-wire repeater, J99343PL, with no signaling lead access.

6. APPLICATIONS

6.01 Impedance compensation units provide facility matching to improve terminal balance characteristics for interfacing 2-wire toll connecting trunks at toll switching offices, PBX-CO trunks, or other 2- to 4-wire metallic facilities transitions. These networks are most frequently used at the customer premises end of network circuits requiring terminal balance as shown in Fig. 7. With these plug-ins, necessary compensation can be provided anywhere an MFT transmission slot is available. Specific facility applications are shown in Table A.

7. MAINTENANCE

7.01 The MFT units require no routine maintenance. If the unit is determined to be faulty, it should be removed from service and replaced with a spare. The defective unit should be sent to the nearest Western Electric Service Center for repair.

8. REFERENCES

8.01 The following references provide additional information concerning MFT impedance compensation networks.

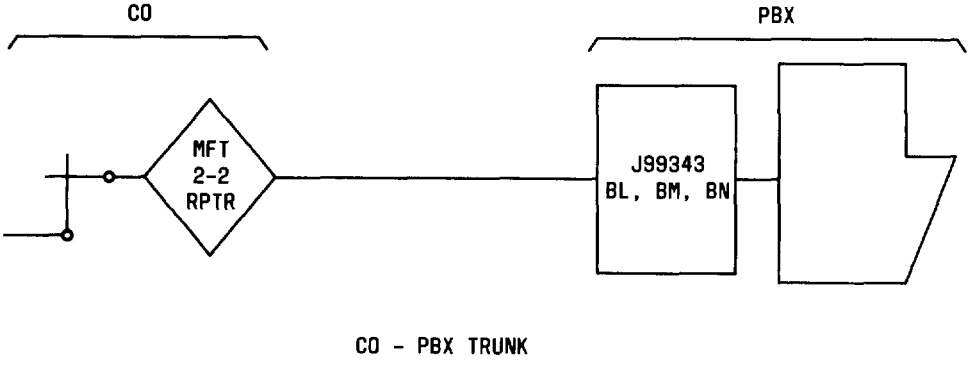


Fig. 7—Typical Application of Impedance Compensation Network

SECTION	TITLE
332-910-180	General Application Information
332-910-206	2-Wire Dual Impedance Compensation Networks—Installation and Testing
332-910-100	MFT—General Description
332-910-101	Shelf, Frame, Power Panel, and Distributing Frame Arrangements, Description

DRAWING	DESCRIPTION
CD-7C100-01	Impedance Compensation Networks, Circuit Description
SD-7C100-01	Impedance Compensation Networks, Schematic Drawing

The appropriate numerical index section should be consulted to find the current issue of the sections listed and any addendum that may have been issued. The pertinent numerical index for the sections listed here is Section 332-000-000.

TABLE A

FACILITY GAUGE APPLICATIONS

KEY TELEPHONE UNIT	MFT UNIT	FACILITY
J99380AA	J99343BL	22-, 24-, or 26-gauge nonloaded
J99380AB	J99343BM	19-, 22-, or 24-gauge H88 or D88 loaded
J99380AC	J99343BN	26-gauge H88 loaded