333B RELAY

DESCRIPTION

1. INTRODUCTION

1.01 This section describes the 333B relay which is designed for use with the 424V4 and J99338F Traffic Service Position System (TSPS) repeaters.

1.02 When this section is reissued, the reason for reissue will be given in this paragraph.

1.03 The 333B relay is a plug-in unit equipped with a 15-pin connector which may be inserted in the NET 1 and/or NET 2 sockets of the 424V4 repeater or the J99338F 4-wire bridging repeater.

1.04 The 333B relay converts E&M lead supervision, type II or type III interface, to 4-wire trunk loop supervision.

1.05 The selection of the type of interface (type II or type III) is by screw switches located on the front panel of the relay (Fig. 1). Only one screw switch, the one corresponding to the desired type of interface, should be closed (turned down).

1.06 The 333B relay supersedes the 333A relay which does not conform to current E&M interface standards.

1.07 The 333B relay can be inserted directly in the NET 2 socket of the 424V4 repeater and in either NET 1 or NET 2 sockets of the J99338F 4-wire bridging repeater. When it is necessary to use the 333B relay in the NET 1 socket of the 424V4 repeater, option ZH per SD-97047-01, issue 23B or later must be provided for satisfactory operation. A compatibility chart is given as part of Fig. 3.

> ***Note:*** The delayed call trunk arrangement is the only application in which the 333B relay might be used in the NET 1 socket of the repeaters.

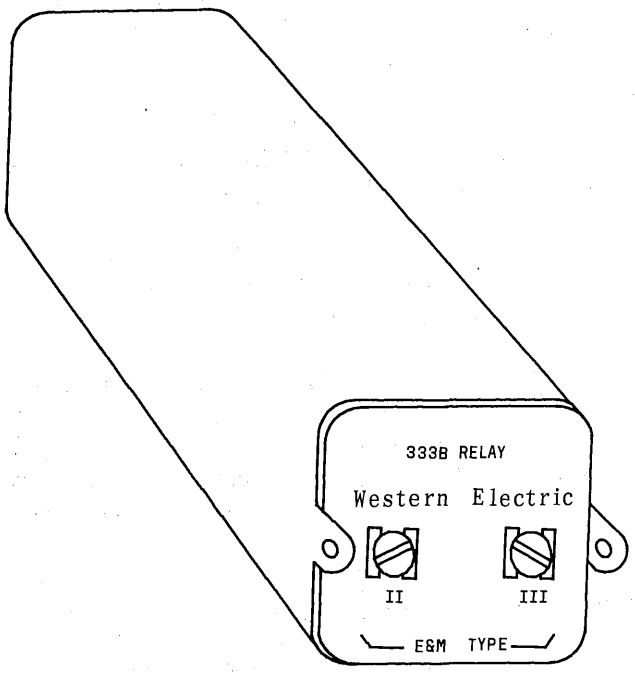


Fig. 1—333B Relay

2. EQUIPMENT DESCRIPTION

2.01 The 333B relay circuit is contained in an aluminum can approximately 1-3/4 inches wide by 1-3/4 inches high by 7 inches long. Tabs on the front of the unit permit its removal from the repeater mounting by the use of the 602D tool.

2.02 The circuit components are mounted on a printed wiring board within the metal can. Connections to the repeater circuit are made through a 15-pin connector mounted on the rear of the unit.

2.03 Two screw-type switches are located on the front of the 333B relay for selecting the E&M type interface.

3. CIRCUIT DESCRIPTION

3.01 Figure 2 is a schematic diagram of the 333B relay. Terminals 1 (SB lead), 8 (M lead), 13 (SG lead), and 4 (E lead) are connected to an F-type, E-type, or other E&M lead signaling unit. Terminals 9 (SX) and 3 (SX1) are connected to the 4-wire trunk SX and SX1 leads.

3.02 Figures 3 and 4 are simplified schematics of the 424V4 and J99338F TSPS repeaters showing the placement of 333B relays.

> ***Note:*** When using the 333B relay in the NET 1 position of the 424V4 repeater, the ZH option is required.

3.03 Figure 5 shows a 333B relay and the signaling portions of an F-type SF signaling unit, the TSPS No. 1 4-wire incoming trunk, and an MF outpulser (MFOP). This arrangement, which uses the type II E&M interface, will be used to describe the 333B relay operation.

3.04 When an outpulsing function to the distant toll office is required, such as the transmission of a called number, the TSPS stored program control will direct an MFOP to be linked to the 4-wire trunk handling the call. The MFOP A relay and the trunk B relay are operated. This results in a closure of the SX and SX1 leads via MFOP ferrod sensors (FS) 0 and 1. This SX/SX1 closure causes the L relay in the 333B relay and the FS 0 and FS 1 ferrods to operate. The L relay operated connects the SB lead (-48V) to the M lead which causes the originating F-signaling unit to transmit an off-hook signal via the transmission facility to the terminating F-type signaling unit at the toll office. The toll office incoming trunk will be seized and, if arranged for wink start dialing, will bid for a sender. When a sender is attached, it will send an off-hook signal via the transmission facility to the originating signaling unit. Upon receipt of the off-hook signal, the R relay of the F-signaling unit releases operating the E relay in the 333B relay. Relay E operating reverses the battery and ground through the MFOP poled ferrod sensors. FS 0 remains operated and FS 1 releases. When the ferrods are scanned, a report will be made to the stored program control of the beginning of the wink signal. When the toll sender is ready to receive information, it will cause an on-hook signal to be transmitted to the originating signaling unit. This causes the R relay of the signaling unit to operate, releasing relay E. FS 1 of the MFOP reoperates, thereby notifying the stored program control to outpulse the called number.

3.05 When outpulsing has been completed, the TSPS 4-wire trunk A relay is operated and the MFOP is removed. FS R is poled by diodes

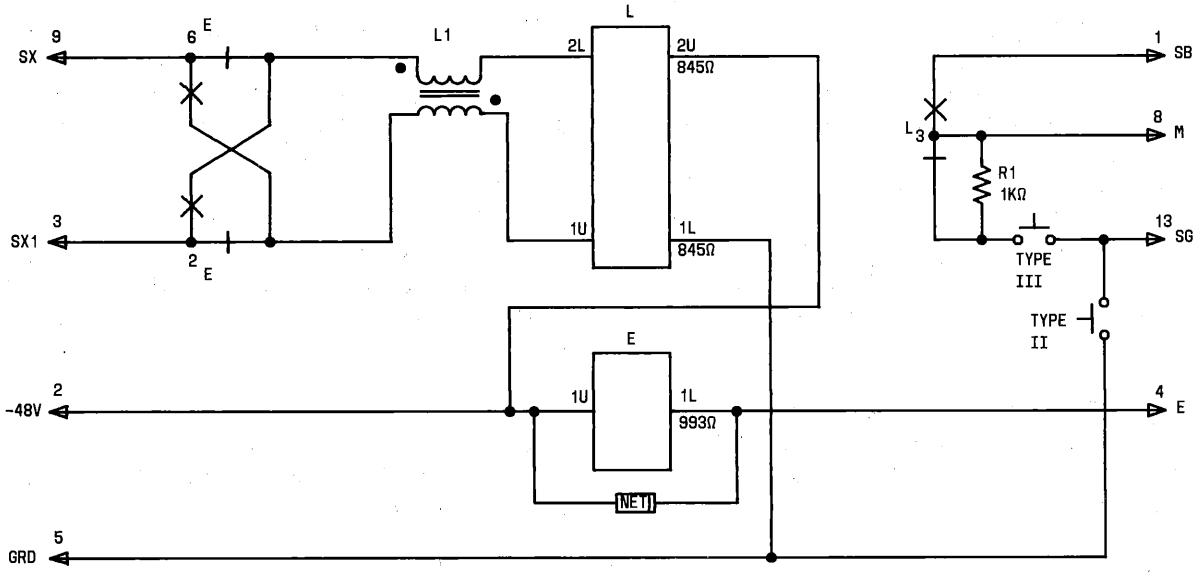


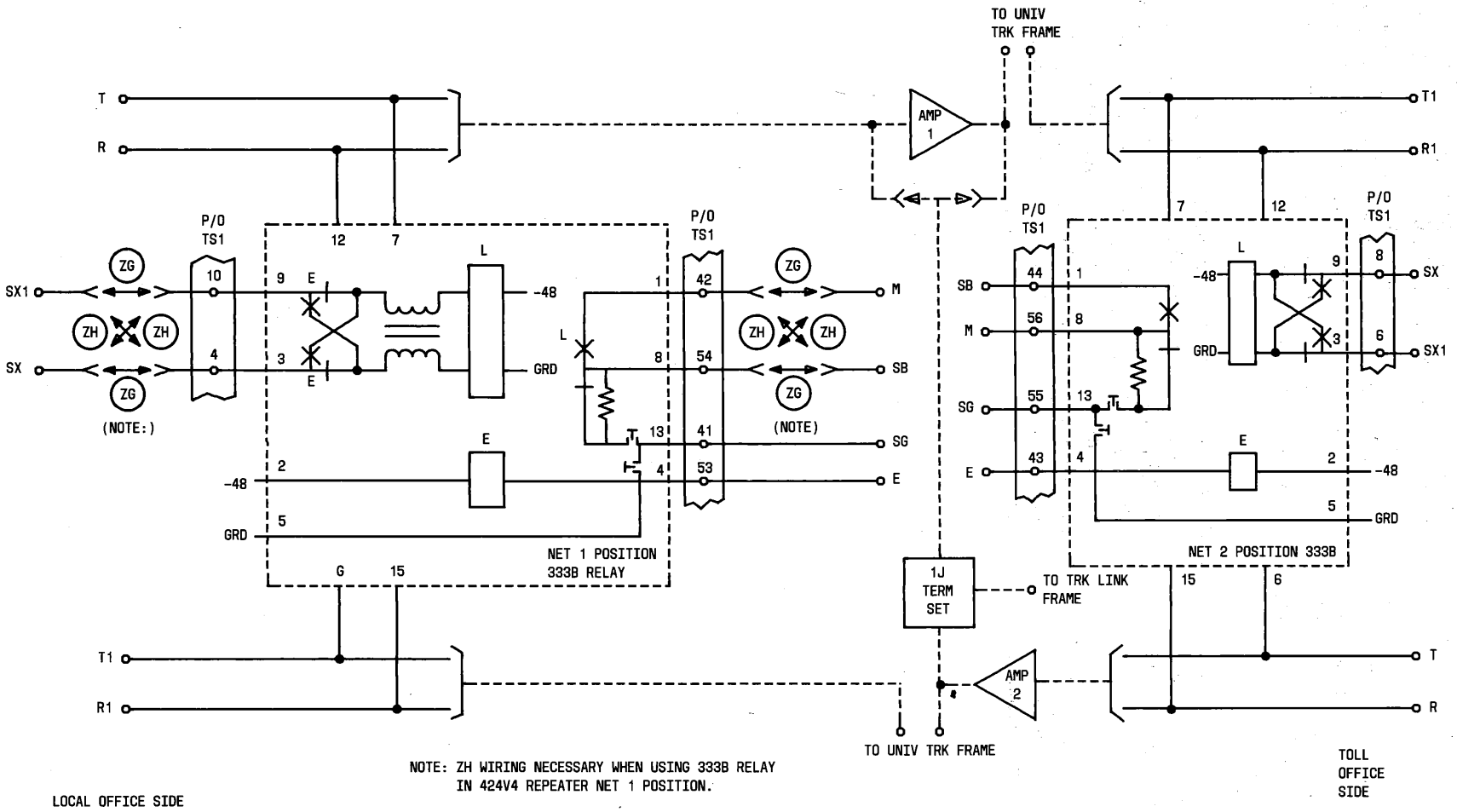
Fig. 2—333B Relay Schematic

and will not operate until the called customer answers.

3.06 When the called customer answers, an off-hook signal is again transmitted from the toll office to the originating F-type signaling unit. Upon receipt of the off-hook signal, the F-type signaling unit R relay releases and the E relay in the 333B relay operates. Due to the battery reversal caused by the operation of the E relay, current now flows through FS R. FS R operated notifies the TSPS stored program control of the called customer answer.

3.07 The trunk remains in the off-hook condition until the called customer disconnects. When this occurs, an on-hook signal is sent from the toll office equipment to the originating signaling unit. Upon receipt of the on-hook signal, the R relay of the F-type signaling unit operates, releasing the E relay of the 333B relay. FS R of the trunk circuit will release under control of the E relay and notify the TSPS stored program control of the on-hook condition.

3.08 The preceding describes the 333B relay as used to interface the loop signaling format of TSPS No. 1 4-wire incoming trunks with an E&M lead F-type signaling unit during a typical call sequence. The 333B relay may also be used to interface 4-wire trunks with other types of E&M lead signaling facilities such as E-type SF units, T1 carrier, DX sets, etc.



NOTE: ZH WIRING NECESSARY WHEN USING 333B RELAY IN 424V4 REPEATER NET 1 POSITION.

Fig. 3—Simplified Schematic—333B Relays in 424V4 Repeater

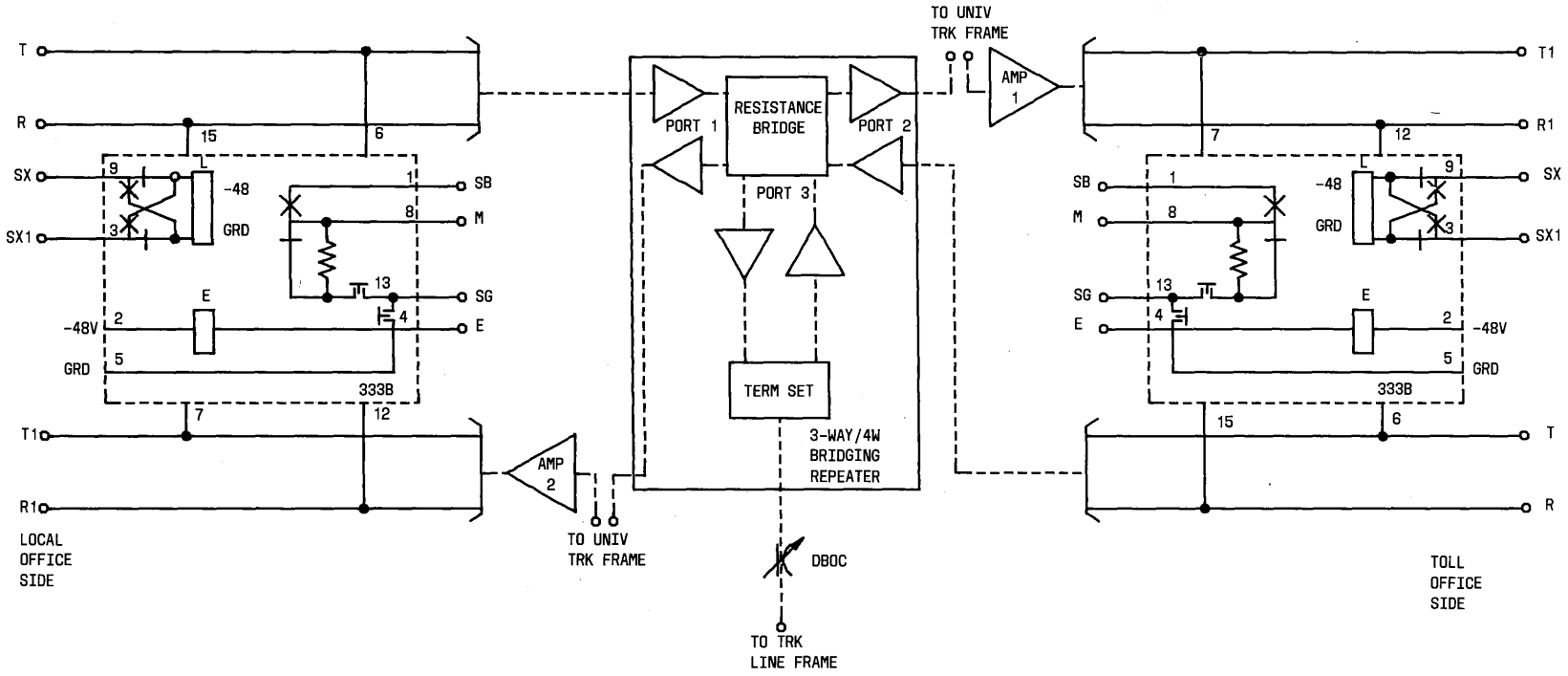


Fig. 4—Simplified Schematic—333B Relays in J99338F TSPS Repeater

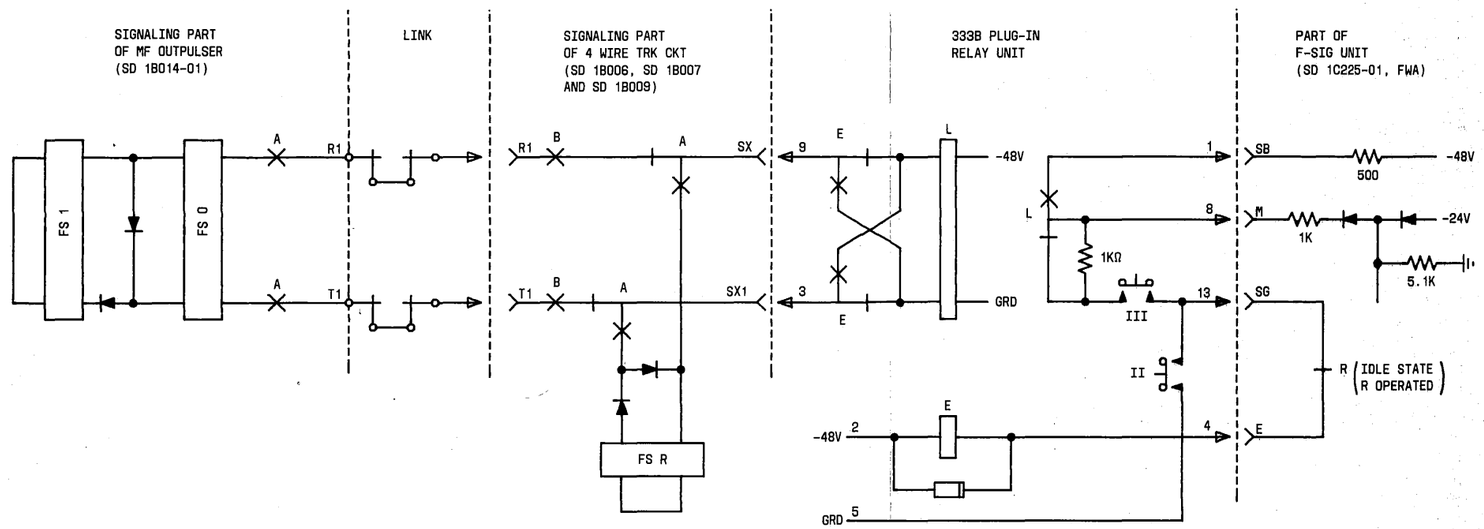


Fig. 5—Composite Diagram of 333B Relay and Signaling Portions of TSPS 4-Wire Trunk Circuit, MFOP, and Type-F Signaling Unit (Type II Interface)