333A RELAY

DESCRIPTION

1. GENERAL

1.01 This section describes the 333A relay which is designed for use in V4 telephone repeater applications.

1.02 The 333A relay is used in the 424V4B repeater to connect 4-wire trunk loop supervision to E and M lead supervision.

2. EQUIPMENT DESCRIPTION

2.01 The 333A relay is a plug-in unit (see Fig. 1) equipped with a 15-pin connector plug and is designed to be plugged directly into the mating connector socket of the equipment mounting shelf. Tabs are provided on the front of the can so that the relay can be removed from its connector socket by the use of a 602D tool. The 333A relay consists of a BF3 miniature wire-spring relay with contact protection (185A network), mounted on a printed-wiring board (see Fig. 2). The 333A relay is housed in a metal can approximately 1-3/4 inches wide by 1-3/4 inches high by 7 inches long.

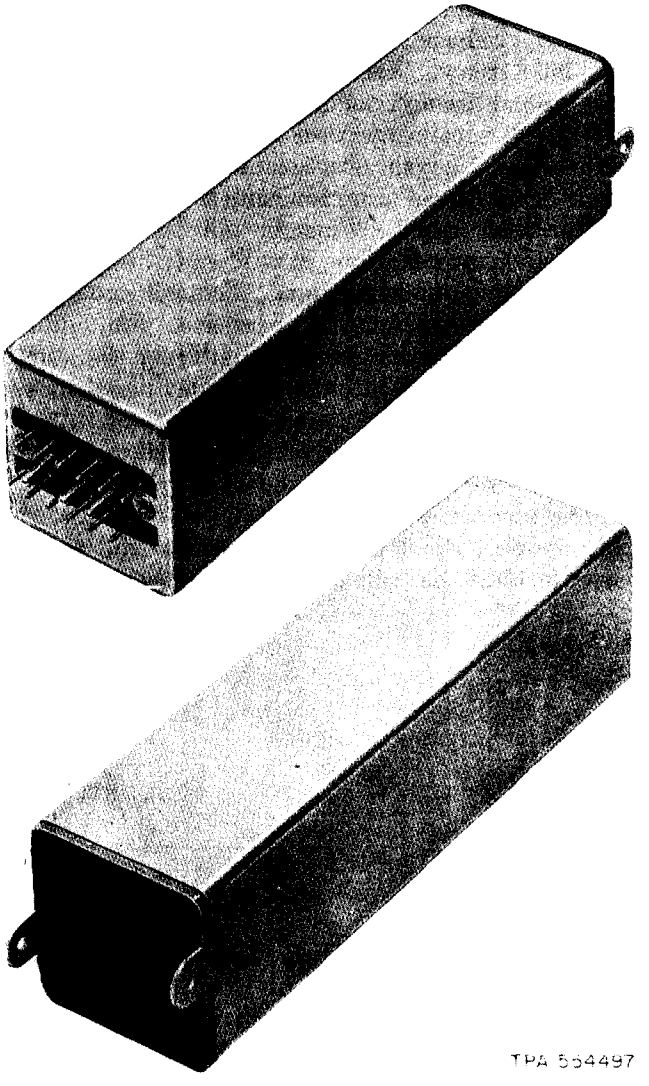

Fig. 1—333A Relay

3. CIRCUIT DESCRIPTION

3.01 The purpose of this circuit is to convert the outgoing supervision of the Traffic Service Position System No. 1 (TSPS) 4-wire incoming trunks from loop to E and M lead supervision. The 333A relay will permit TSPS 4-wire trunks to function satisfactorily with a number of E and M lead signaling facility arrangements. Some of these arrangements are shown in block diagram form in Fig. 3.

3.02 The composite diagram, Fig. 4, shows only the 333A relay and the signaling portions of the F-type SF signaling unit, the TSPS No. 1 4-wire incoming trunk, and an MF outpulser (MFOP). This figure will be used to describe the circuit operation.

3.03 When an outpulsing function to the distant toll office is required, such as the transmitting 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 will present a loop closure from lead SB of the originating F signaling unit, through contacts of the 333A relay and MFOP ferrod sensors (FS) 0 and 1 to lead M of the signaling unit. These ferrods will operate on the loop closure. The originating signaling unit recognizes this closure as an off-hook signal and transmits the off-hook signal

through the transmission facility to the terminating F signaling unit at the toll office. The toll office incoming trunk will be seized, and if arranged for "wink start of dialing," will bid for a sender. When a sender is attached, it will send an off-hook signal through the transmission facility to the originating signaling unit. Relay R of the originating unit will release, which will operate relay E (of the 333A relay). Relay E will reverse the battery and ground through the MFOP poled ferrod sensors. FS 0 will remain operated and FS 1 will release. When these 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 end the off-hook signal with an on-hook signal. This will cause relay R to operate and relay E to release. FS 1 of the MFOP will reoperate, thereby notifying the stored program control to outpulse the called number.

3.04 When outpulsing is completed, the TSPS 4-wire trunk called supervisory FS R is cut through by the operation of relay A and the MFOP is removed. FS R is poled by diodes and will not operate until the called customer answers. When this occurs, an off-hook signal is repeated by the toll office equipment to the originating signaling unit. The reception of this signal will cause relay R to release and relay E to operate. FS R of the trunk will operate, thereby notifying the stored program control of answer.

3.05 The trunk remains in the off-hook condition until the called customer disconnects. When this occurs, an on-hook signal is repeated by the toll office equipment to the originating signaling unit. Relay R will operate and relay E will release. FS R of the trunk will release under control of relay E and will notify the TSPS stored program control of the on-hook indication.

Note: The preceding circuit description explains how the 333A relay interfaces the loop signaling format of the TSPS No. 1 4-wire incoming trunks with the E and M lead F-type signaling unit, in a typical call sequence. The 333A relay can also interface the 4-wire trunks with other types of E and M lead signaling facilities, such as E-type signaling units, T1 carrier, DX sets, etc.

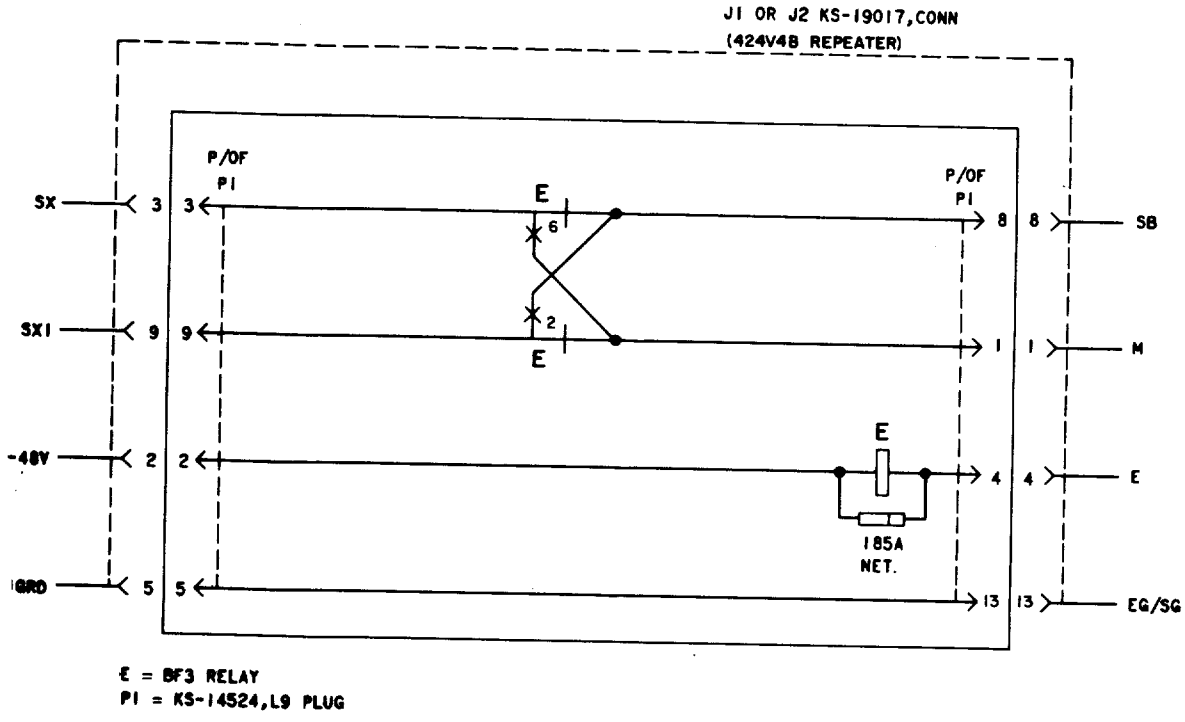

Fig. 2—Schematic of 333A Relay

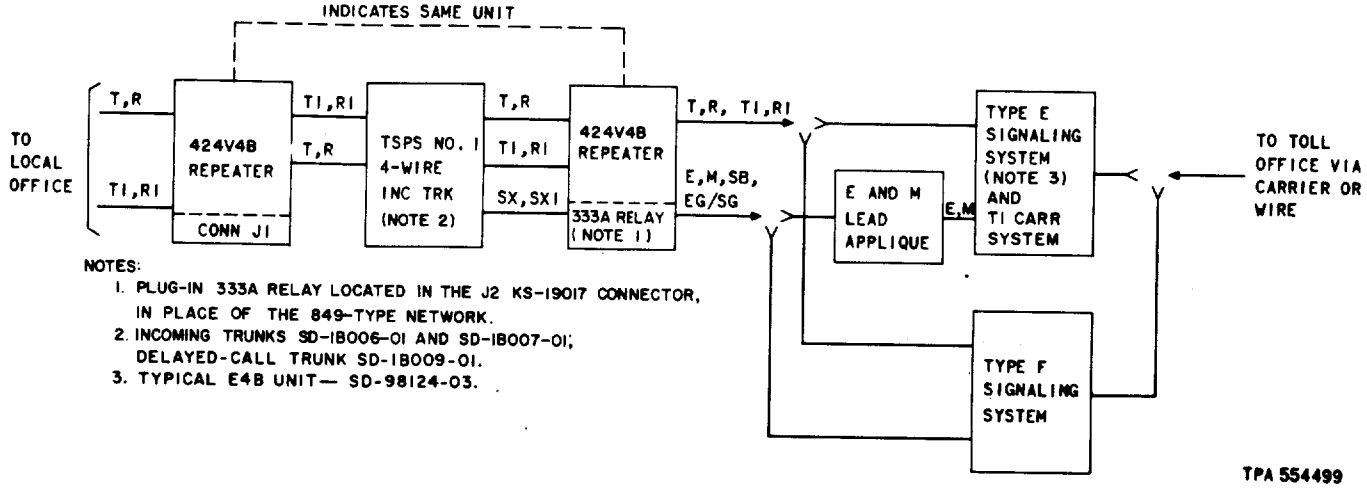

Fig. 3—TSPS No. 1 4-Wire Incoming Trunk With Various Signaling Arrangements

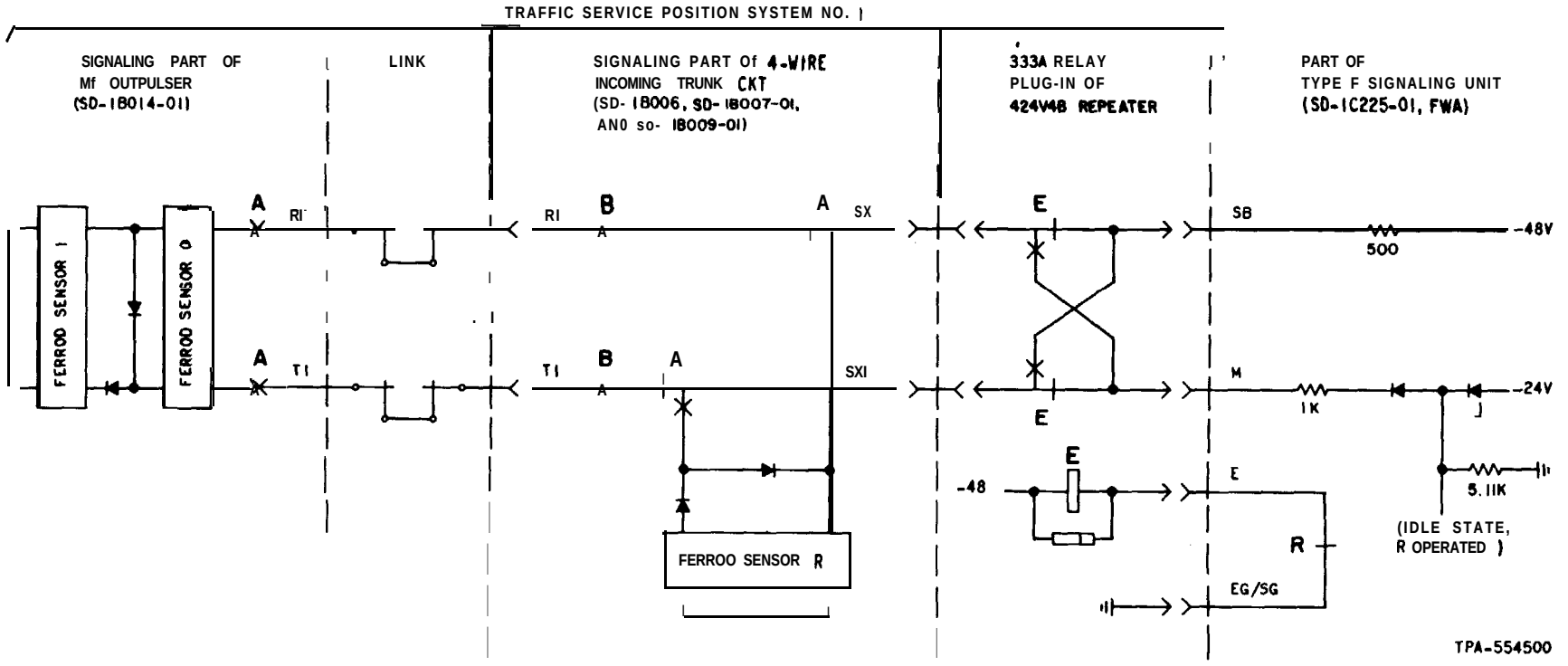

Fig. 4—**Composite** Diagram of 333A Relay and Signaling Portions of the MFOP, **4-Wire** Trunk, and Type F SignalingUnit