

112A KEY EQUIPMENT
MAINTENANCE LINE AND STATION CIRCUIT
FOR
SAGE AIR DEFENSE

1.00 INTRODUCTION

1.01 This section covers the identification, installation, connections, and maintenance of the maintenance line and station circuit. Also, it includes a composite schematic drawing of the circuit.

1.02 This circuit provides a 2-wire circuit terminating in a control station key telephone set and multiple jack stations.

2.00 IDENTIFICATION

2.01 The maintenance line and station circuit provides the following station switching features: pickup of one or two lines from a 701A PBX, holding, visual line signals (flashing on incoming, steady on

busy or hold), manual intercommunicating, and transfer of station jacks.

MAINTENANCE LINE UNITS

2.02 One J53022A, List 1 unit is used for each maintenance line and station circuit. This equipment will be mounted in the equipment room and will use a 2-inch mounting space on a 23-inch relay rack. This unit is illustrated in Figs. 3 and 4.

CONTROL STATIONS

2.03 Control stations consist of two 15-type indicators, one 6017D key and one 511- or one 558-type telephone set for desk or wall mounting, respectively. Depressing the turn-push button of the telephone sets activates the hold circuit on the first line. When the turn-push button is in the vertical

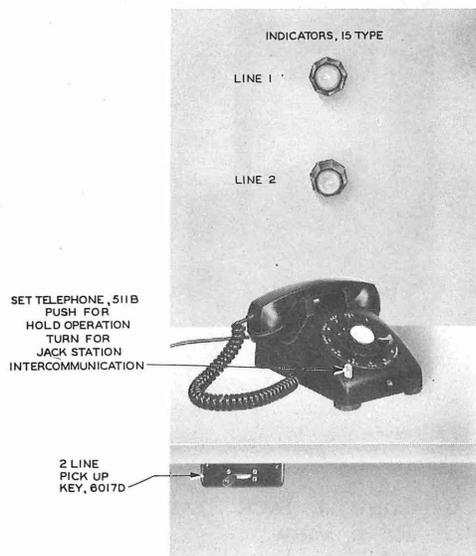


FIG. 1—KEY TELEPHONE CONTROL STATION, DESK TYPE

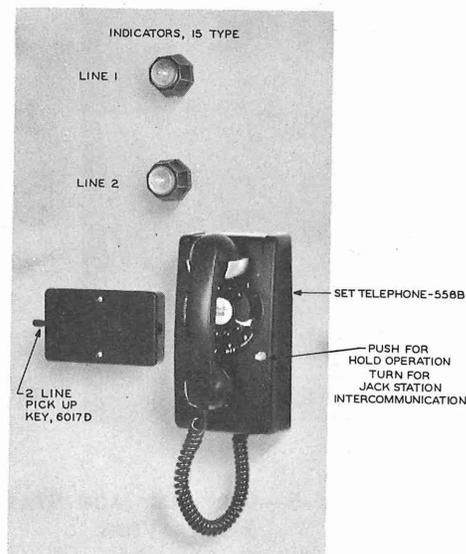


FIG. 2—KEY TELEPHONE CONTROL STATION, WALL TYPE

SECTION C71.670

position, the telephone set and jack or jacks may be connected to the line. When the turn-push button is in the horizontal position, the telephone set and jack or jacks are disconnected from the 701A PBX line and are connected together as an intercommunicating line. The external switching key permits the picking up of two 701A PBX lines. The indicators provide visual signals for these lines.

JACK STATIONS

2.04 One hold key and jack is required for each jack station. These stations cannot originate calls since a dial is not provided. One line can be picked up at each jack. Each line is connected to at least one jack station.

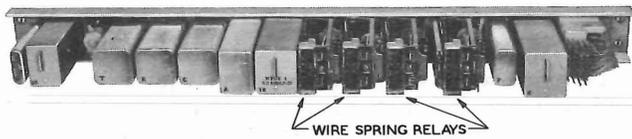


FIG. 3—MAINTENANCE LINE EQUIPMENT UNIT, FRONT VIEW

2.05 This practice contains a cable and terminal connecting chart showing the CDF cross connections and part of the miniature connector to be used in the station wiring for the front and rear jack multiples of the console (see Figs. 5 and 6).

3.00 INSTALLATION

3.01 This section covers the installation of the 112A key equipment maintenance line in the SAGE direction center and various locations of the apparatus to be installed in the customer's consoles and computers (see Fig. 7).

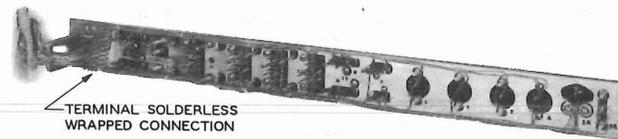


FIG. 4—MAINTENANCE LINE EQUIPMENT UNIT, REAR VIEW

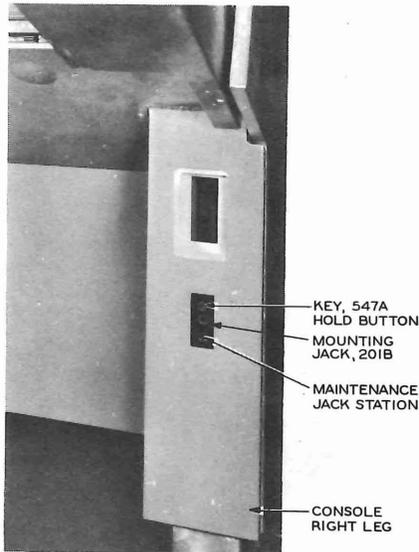


FIG. 5—CONSOLE JACK STATION, FRONT VIEW

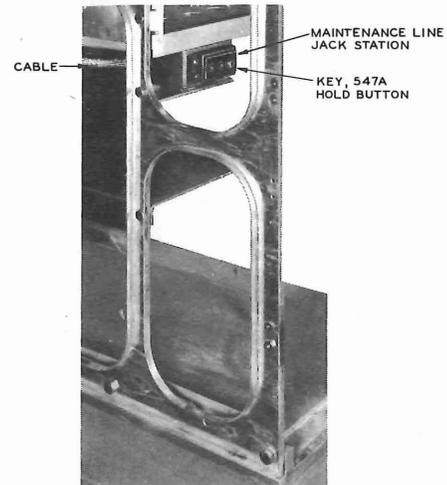


FIG. 6—CONSOLE JACK STATION, REAR VIEW

3.02 It does not cover items common to the general station work practices on keys, jacks, and telephone sets.

3.03 The 112A key equipment should be installed only upon issuance of a service order or other proper authorization as the telephone operating panels are arranged for mounting in the customer's consoles and desk.

Caution: *Do not come in contact with 110-volt power supply in customer's equipment.*

3.04 The installer will place the ED69273-G1, Group 2 cable arrangement in the console where the customer has provided for it; he will install keys, jacks, and lamps.

3.05 The composite circuit drawing SD69267-01 shows the vertical or horizontal central distributing frame (V or H, CDF) terminals, miniature connector, and the necessary cable wires to be connected to the keys and jacks.

4.00 CONNECTIONS

4.01 This section covers the list of typical connecting circuits for information used in the 112A key equipment maintenance line.

- PBX station line circuits, 701A PBX switchboard (SD66020-01 for multiple and SD66082-01 for nonmultiple station lines).
- 112A key equipment flashing circuit (SD69266-01).
- Cable terminals on the central distributing frame and equipment unit terminals (SD69267-01).

4.02 The composite circuit drawing SD69267-01 is attached showing the figures and options that can be used when a pickup key and a second station line circuit are added. This drawing will familiarize the installer and maintenance repairmen with the circuit.

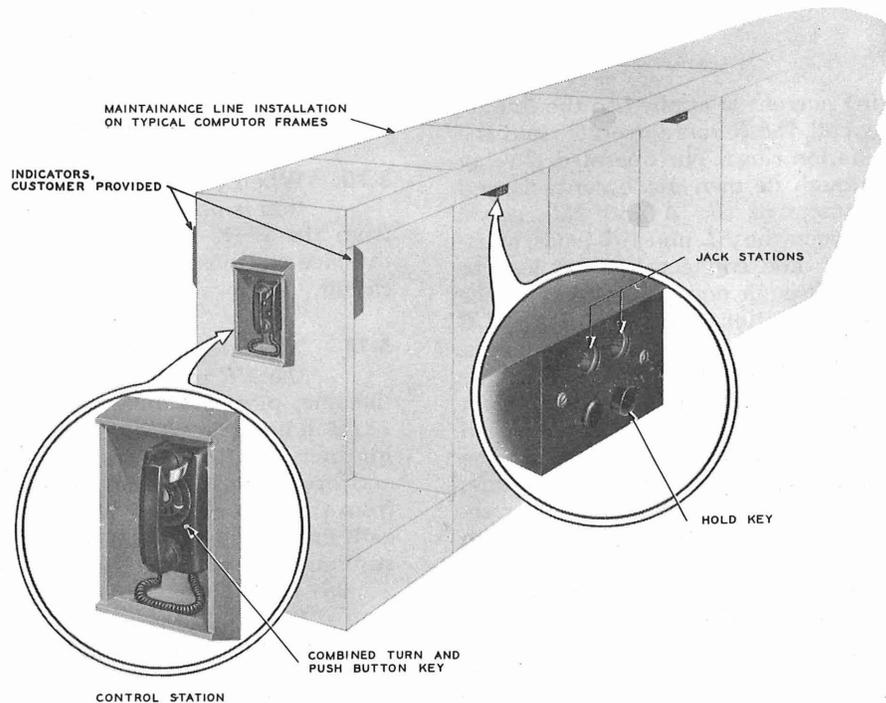


FIG. 7—KEY TELEPHONE CONTROL STATION AND JACK STATIONS

SECTION C71.670

5.00 MAINTENANCE

5.01 This section covers the 112A key equipment maintenance line and the procedure to maintain service.

5.02 The general maintenance of hand telephone sets, head telephone sets, dials, etc, used with the 112A key equipment and commonly used at other stations, is not given in this section. Reference should be made to the C sections covering these apparatus items.

5.03 Similarly, maintenance information on keys and relays is not included. Reference should be made to the appropriate section in the B series.

5.04 This section provides for following the operational sketches with various types of symbols and wire-spring relay contact designations in the sequence of the circuit functions.

OPERATION

5.05 When ringing current is applied to the line on an incoming call, the *R* relay operates and the bell at the control station rings. The operated *R* relay holds to battery through its own made contacts and through normal contacts of the *A* and *H1* relays; closes the circuit between the *FL* and *FR* leads, starting the flashing circuit; and connects the *LB* lead to the line lamp circuit through normal contacts of the *A* and *H1* relays. Intermittent battery on the *LB* leads from the flashing circuit flashes the line lamps. When the hand telephone set is removed from its mounting, the mounting switch on the telephone set connects ground from the *G* lead over the *A1* lead through normal contacts of the *H* relay, operating the *A* relay; connects the handset transmitter to the line; and removes the short circuit from the handset receiver. The operated *A* relay removes battery from the lockup path of the *R* relay, thereby releasing it; opens the ringup path of the *R* relay by opening the connection to the ring side of the line; and lights the line lamp steadily through normal contacts of the *H1* relay. The release of the *R* relay opens the closure between the *FL* and *FR* leads, stopping the flashing on this line, and opens the *LB* lead to the line lamp, removing the intermittent battery from the lamp lead. The talk circuit is now established.

5.06 When the plug associated with a head telephone set is inserted at a jack station, the *TB* relay operates. The operated *TB* relay connects ground through normal contacts of the *TR* and *H* relays operating the *A* relay. The operated *A* relay performs the same functions as the hand telephone set. The talk circuit is now established.

5.07 When the Hold key (push-button contacts of the turn-push button) at the control station is operated, battery on the *B* lead is connected over the *H* lead to the *H* relay which operates to ground on the *A* lead through the hand telephone set mounting switch contacts. The operated *H* relay holds operated to battery through its own make contacts when the Hold key is released. The operated *H1* relay holds operated to battery through its own make contacts and normal contacts of the *A* relay, provides battery to keep the line lamp lighted steadily, removes battery from the lockup path of the *R* relay, and connects the *H* hold resistor across the line which provides supervision to the PBX.

5.08 After the hold condition has been established, the line may be picked up either by removing the handset from its mounting or by inserting a head telephone set plug at a jack station, operating the *A* relay which releases the *H1* relay and removes the hold resistor from the line. The talk circuit is then re-established.

5.09 When the *H* hold key at the jack station location is operated, battery is connected through normal contacts of the *TB* relay to the *H* relay which operates and performs the same functions as described above. The talk circuit is then re-established.

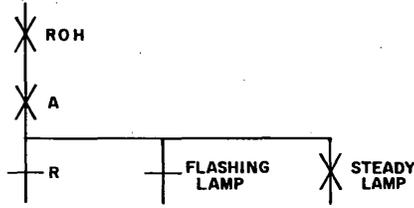
5.10 When the turn-push button at the control station is operated, the jack stations are removed from the PBX line which permits the line between the jack stations to be used as an intercommunicating circuit.

5.11 The operation of the turn-push button operates the *TR* relay, removing the jack stations from the line; places a shunt on terminals 1 and 6 of the *181B* induction coil when the *TB* relay is operated to improve the transmission between the jack stations; and opens the operating path of the *A* and *H* relay from the jack stations. With the *TR* relay operated, a call may be originated or received at the control station.

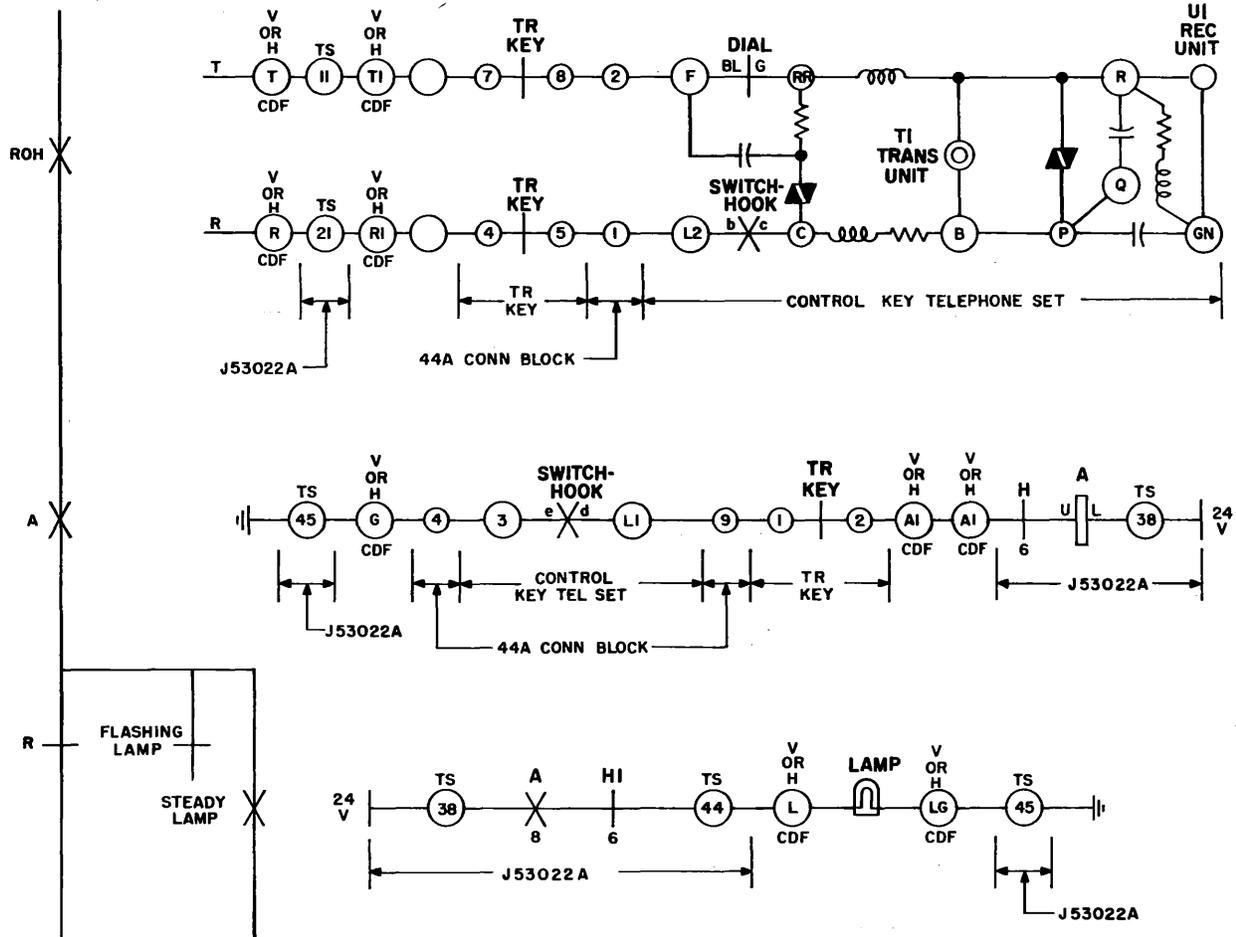
5.12 When ringing current is applied to the second PBX station line on an incoming call the *SR* relay operates. The *SR* relay operates during the ringing periods only. The operated *SR* relay lights an incoming call indicator lamp at the control station.

5.13 The operated *TR* key transfers the *T1* and *R1* leads of the control station telephone set from the maintenance line to the *T2* and *R2* leads of the second PBX line and opens the *A1* lead from the telephone set to the maintenance line circuit. The ringer in the telephone set remains connected to the maintenance line so that an incoming call signal on the maintenance line may be received even though the handset is transferred to the second PBX line.

SEQUENCE CHART



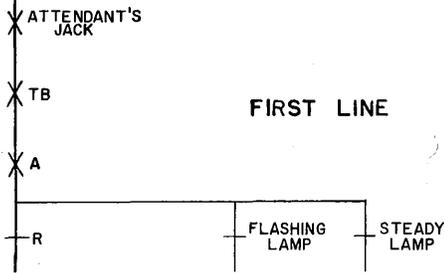
OPERATIONAL SKETCH



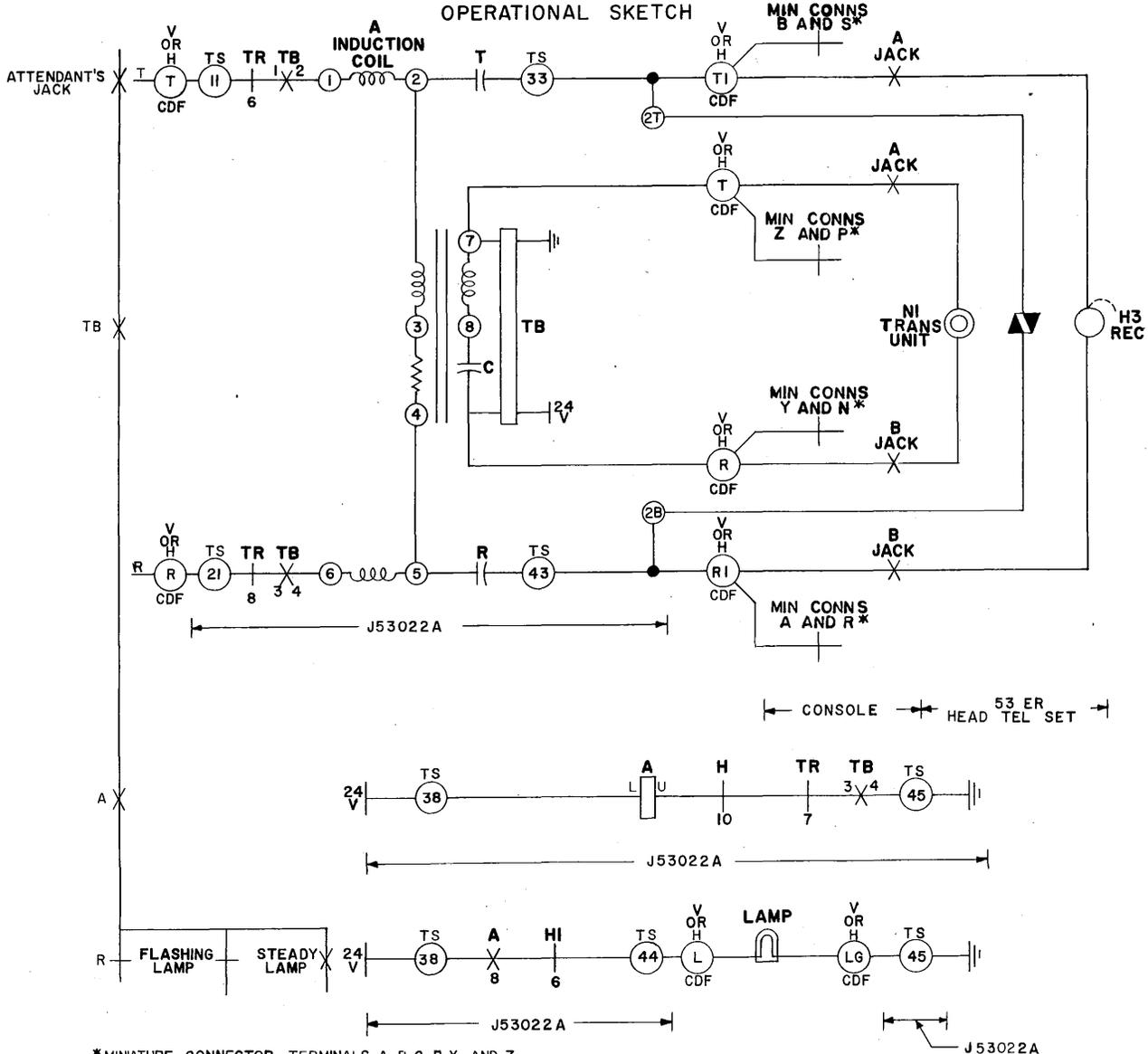
Reference: SD69267-01, Issue 3

FIG. 9—ANSWERING AN INCOMING CALL AT THE CONTROL STATION

SEQUENCE CHART



OPERATIONAL SKETCH

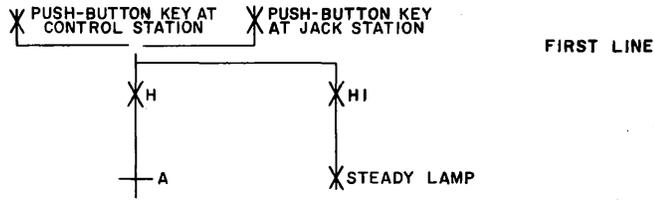


*MINIATURE CONNECTOR TERMINALS A, B, C, P, X, AND Z FOR FRONT OF CONSOLE AND TERMINALS N, P, R, S, T AND U FOR REAR OF CONSOLE

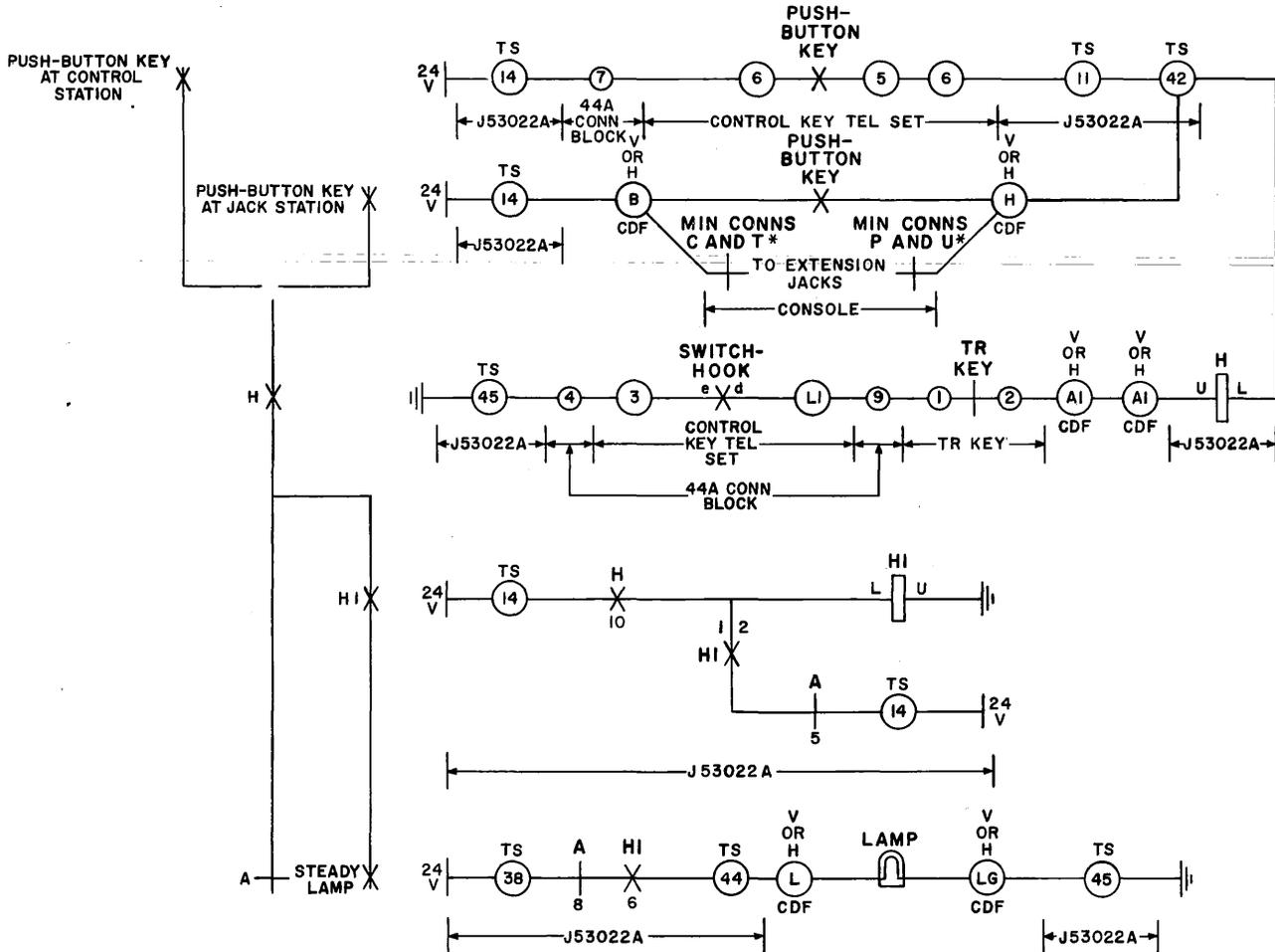
Reference: SD69267-01, Issue 3

FIG. 10—ANSWERING AN INCOMING CALL AT THE JACK STATION, FIRST LINE

SEQUENCE CHART



OPERATIONAL SKETCH

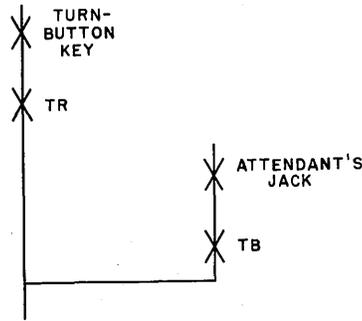


*MINIATURE CONNECTOR TERMINALS A, B, C, P, X, AND Z FOR FRONT OF CONSOLE, AND TERMINALS N, P, R, S, T, AND U FOR REAR OF CONSOLE.

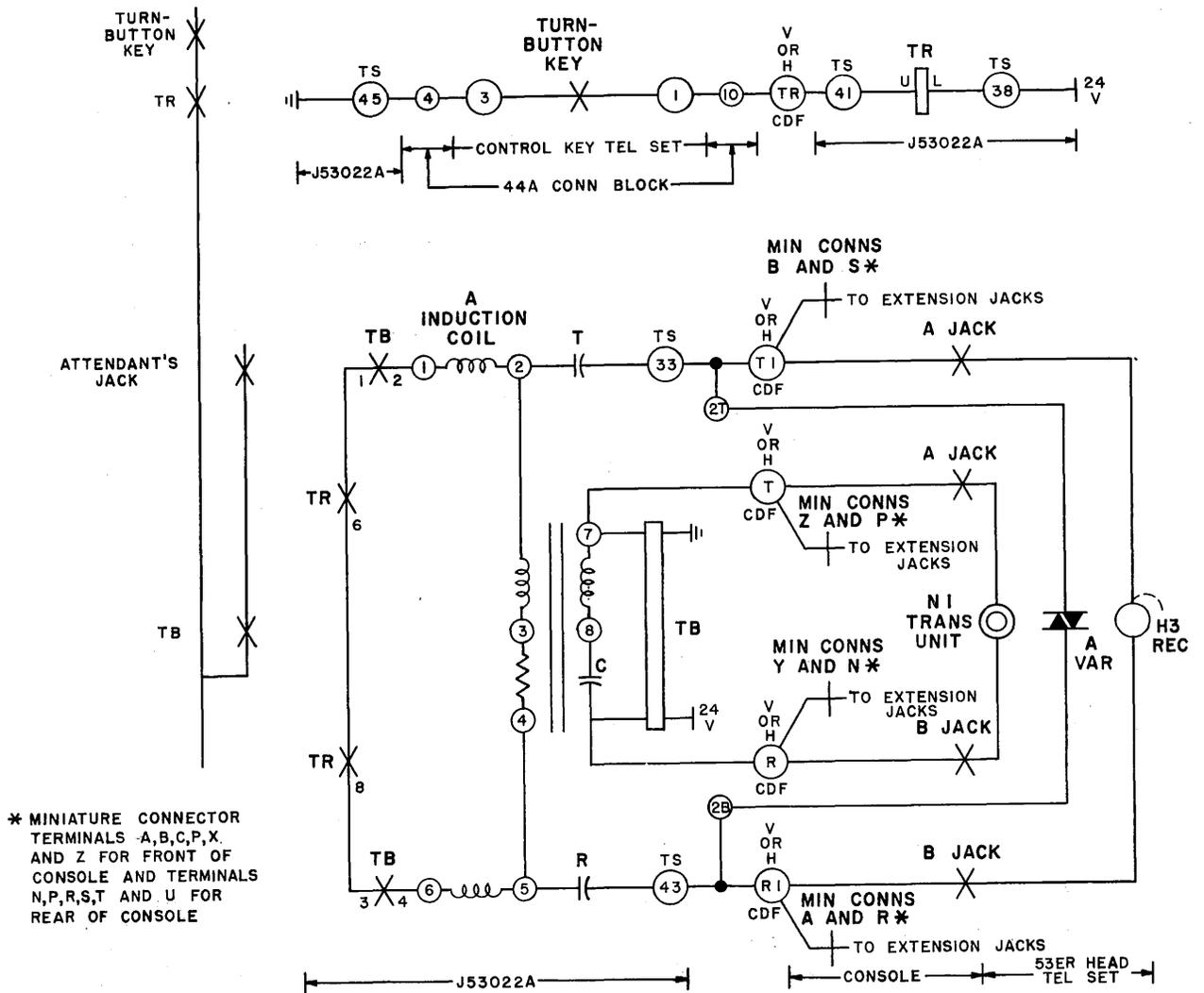
Reference: SD69267-01, Issue 3

FIG. 11—HOLDING A CALL AT THE CONTROL STATION OR JACK STATION, FIRST LINE

SEQUENCE CHART



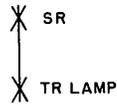
OPERATIONAL SKETCH



Reference: SD69267-01, Issue 3

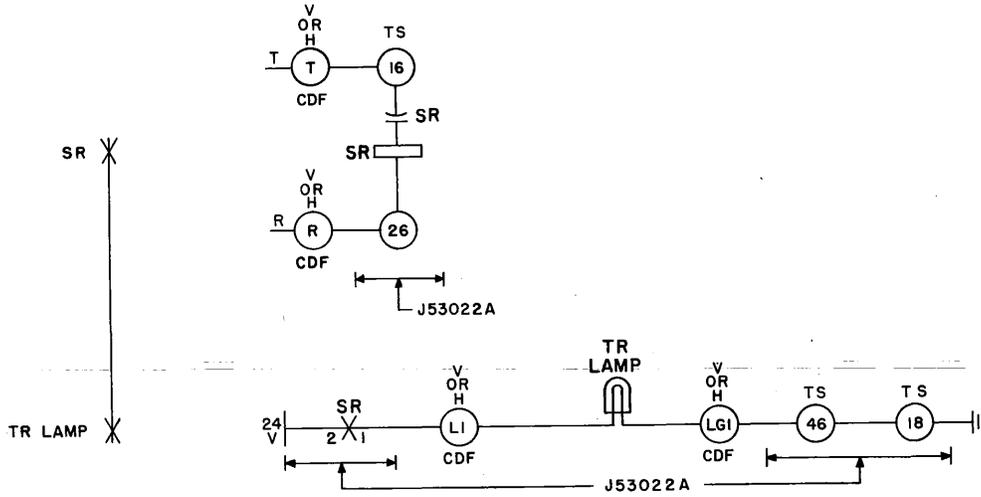
FIG. 12—TURN-BUTTON INTERCOMMUNICATION

SEQUENCE CHART



SECOND LINE

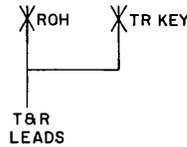
OPERATIONAL SKETCH



Reference: SD69267-01, Issue 3

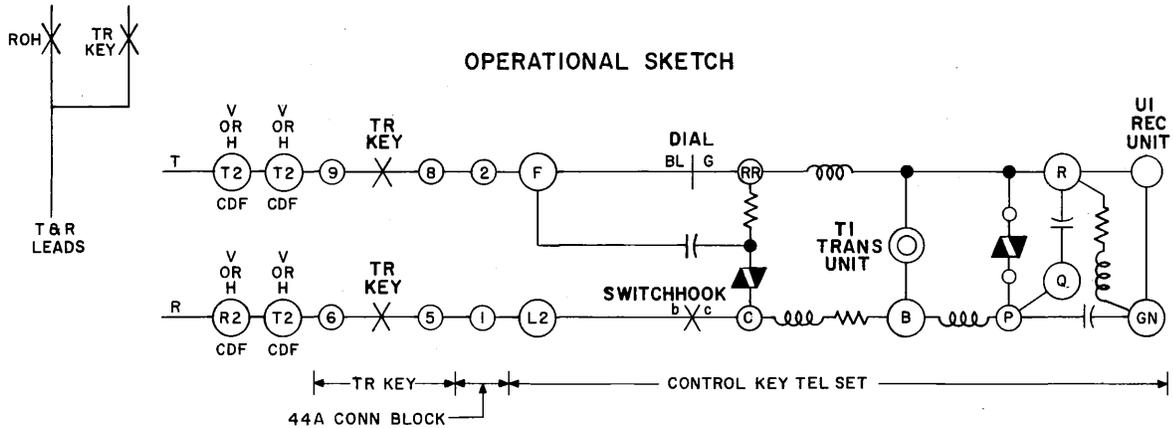
FIG. 13—INCOMING CALL AT CONTROL STATION ONLY, SECOND LINE

SEQUENCE CHART



SECOND LINE

OPERATIONAL SKETCH



Reference: SD69267-01, Issue 3

FIG. 14—ANSWERING AN INCOMING CALL AT THE CONTROL KEY TELEPHONE SET, SECOND LINE

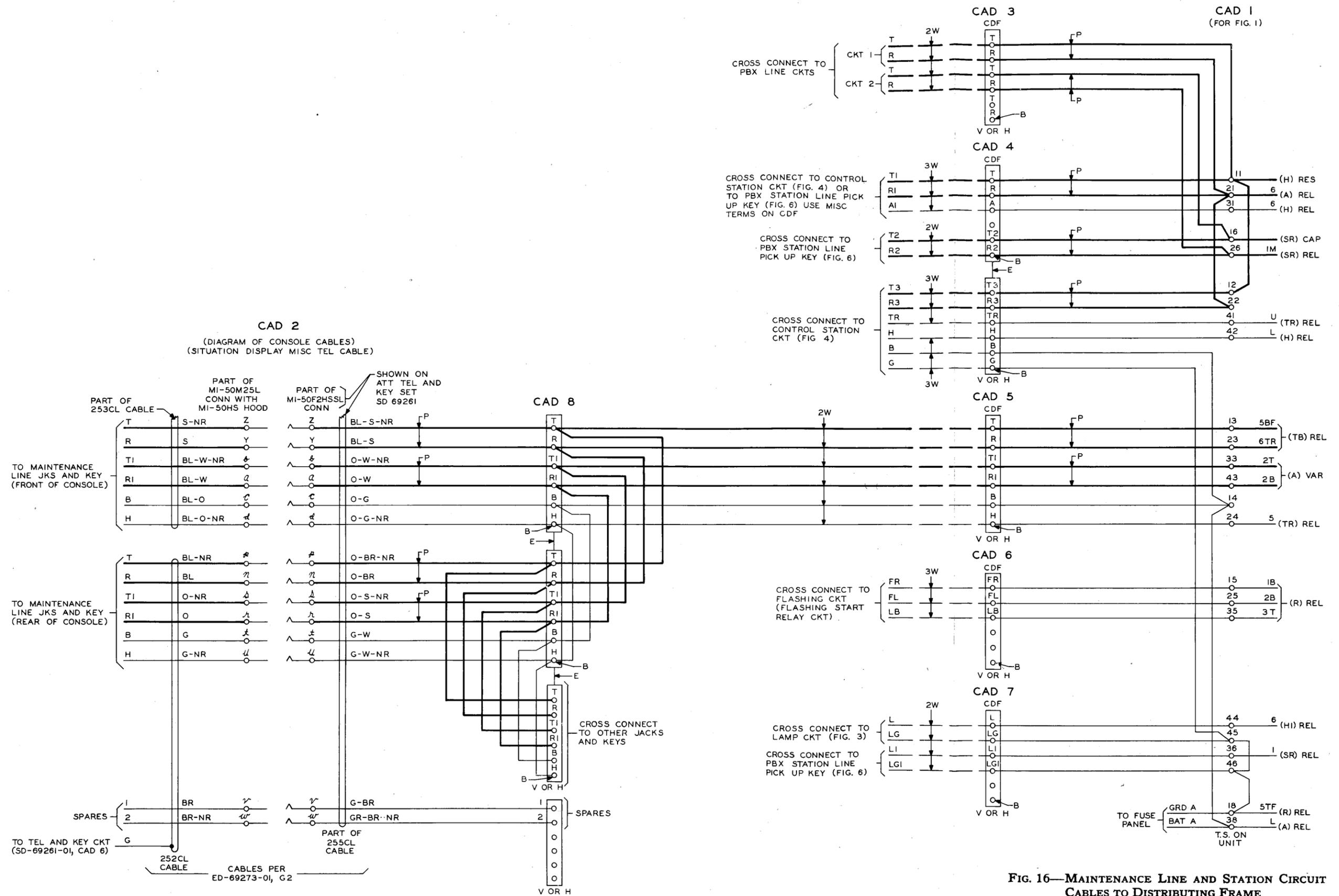


FIG. 16—MAINTENANCE LINE AND STATION CIRCUIT CABLES TO DISTRIBUTING FRAME