

1A1 KEY TELEPHONE SYSTEM  
TIE AND STATION LINES  
203A AUTOMATIC TIE LINE UNIT  
204A RINGDOWN TIE LINE UNIT  
205A STATION LINE UNIT  
(CONNECTION DATA)

*OBSCOLETE  
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1.00 GENERAL

1.01 This section covers connections at the apparatus cabinet for tie and/or station lines. This includes strapping between key telephone units, terminating of lines from feeder terminals, and terminating of key or running cables from key telephone stations.

1.02 The data shown in this section at the time of its issuance reflects the latest wiring connection arrangements. In some cases these connections are not consistent with those shown on existing drawings.

2.00 CONNECTIONS

2.01 The connection drawing shows the necessary terminations to be made

for power, cross connection straps within and between key telephone units, and terminations of key or running cable from telephone sets (see Fig. 4).

2.02 The connection drawing is supplemented by feature circuit drawings as follows:

- Automatic Tie Line Circuit (Fig. 1).
- Ringdown Tie Line Circuit (Fig. 2).
- Station Line Circuit (Fig. 3).

These drawings and a description of operation have been included as an aid for clearing possible cases of trouble which might be encountered.

3.00 DESCRIPTION OF OPERATION

AUTOMATIC TIE LINE CIRCUIT (FIG. 1)

3.01 Incoming Call - Battery and ground, coming in over the line from similar equipment at the distant end, operates the (L) relay which operates the (L1) relay. The (L1) relay closes the audible signal circuits to give a steady audible signal, connects the signal lamp to the lamp flashing circuit of 209A or 212A key telephone unit, and starts the flashing and time-out circuit functioning.

3.02 Answering an Incoming Call - An incoming call is answered by operating the pickup key associated with the line being rung and removing the handset from its mounting. Current through the telephone set operates the (TB) relay which releases the (L1) relay, operates the (TO) relay of 209A or 212A key telephone unit, and operates the (CO) relay, which locks operated under parallel control of the (TB) and (L) relays and lights the signal lamps steady. Release of the (L1) relay opens the audible signal circuits, disconnects the signal lamp from the flashing circuit, and stops the flashing circuit.

3.03 Outgoing Call - An outgoing call is originated by operating the pickup key associated with the line and removing the handset from the mounting. Current through the telephone set operates the (TB) relay which operates the (CO) and (L) relays and the (TO) relay of 209A or 212A key telephone unit and connects battery and ground to the ring and tip of the line, respectively, to operate the signaling circuit

at the distant end. The (CO) relay lights the signal lamp steady and locks operated under parallel control of the (L) and (TB) relays. No change takes place in this circuit when the call is answered at the distant end.

3.04 Holding - The holding feature is not provided with this circuit; but if the local station disconnects and the distant station does not, the signal lamps will remain lighted steady.

3.05 Disconnection - The (CO) relay remains operated until both the local and distant parties have disconnected, keeping the busy lamp lit and preventing a false incoming signal. If the party at the distant end disconnects first, no change occurs in the local circuit until the local party disconnects. The (TB) relay then releases, which releases the (TO) relay of 209A or 212A key telephone unit, opens the operating path of the (CO) relay, and removes battery and ground from the ring and tip of the line, respectively, and from the (L) relay. The (L) relay releases and in turn releases the (CO) relay extinguishing the signal lamp and restoring the circuit to normal. If the local party disconnects first, the (TB) relay releases, opening the operating path for the (CO) relay, releasing the (TO) relay, and removing local battery and ground from the line. The (L) relay remains operated by current over the line from the distant station until that party disconnects, removing battery and ground from the line and releasing the (L) relay which releases the (CO) relay, extinguishing the signal lamp and restoring the circuit to normal.



RINGDOWN TIE LINE (FIG. 2)

3.06 Incoming Call - A ringing signal into the tie-line circuit flows through the (R1) capacitor, the (R) thermistor, and the (R) relay on one half of the cycle, and through the (R) varistor shunted across the relay on the other half of the cycle. The cold resistance of the (R) thermistor, initially, is too high to permit operation of the relay, but the resistance is lowered by heating the ringing current until the relay operates after approximately 1/2 second of ringing. The (S) 317A varistor protects the (R) varistor and the (R) thermistor from transients. The (R) relay closes the second common ringing circuit which follows the incoming ringing and operates the (R1) relay, which locks operated under control of the (TB) relay and of the (TO) relay of 209A or 212A key telephone unit. The (R1) relay closes the first common audible ringing circuit which provides a steady audible signal, connects the signal lamp to the flashing circuit, and starts the flashing and time-out circuit functioning.

3.07 Answering an Incoming Call - An incoming call is answered by operating the pickup key associated with the line being rung and removing the handset from the mounting. Current through the telephone sets operates the (TB) relay which

releases the (R1) relay, lights the signal lamp steady, operates the (TO) relay of 209A or 212A key telephone unit, and connects the talking circuit of the key telephone set to the line. Release of the (R1) relay silences the steady common audible signal and stops the lamp flashing circuit.

3.08 Outgoing Call - An outgoing call is originated by operating the pickup key associated with the line and removing the handset from the mounting. Current through the telephone set operates the (TB) relay which in turn operates the (TO) relay of 209A or 212A key telephone unit, lights the signal lamps steady, and connects the talking circuit of the key telephone set to the line. The local party signals the called station by operating the signaling key which in turn operates the (RO) relay which connects ringing current to the line. No change takes place in the local circuit when the distant station is answered.

3.09 Holding - The holding feature is not provided with this circuit.

3.10 Disconnection - When the local station is disconnected, the (TB) relay releases, extinguishing the signal lamps, releasing the (TO) relay of 209A or 212A key telephone unit, and restoring the circuit to normal.

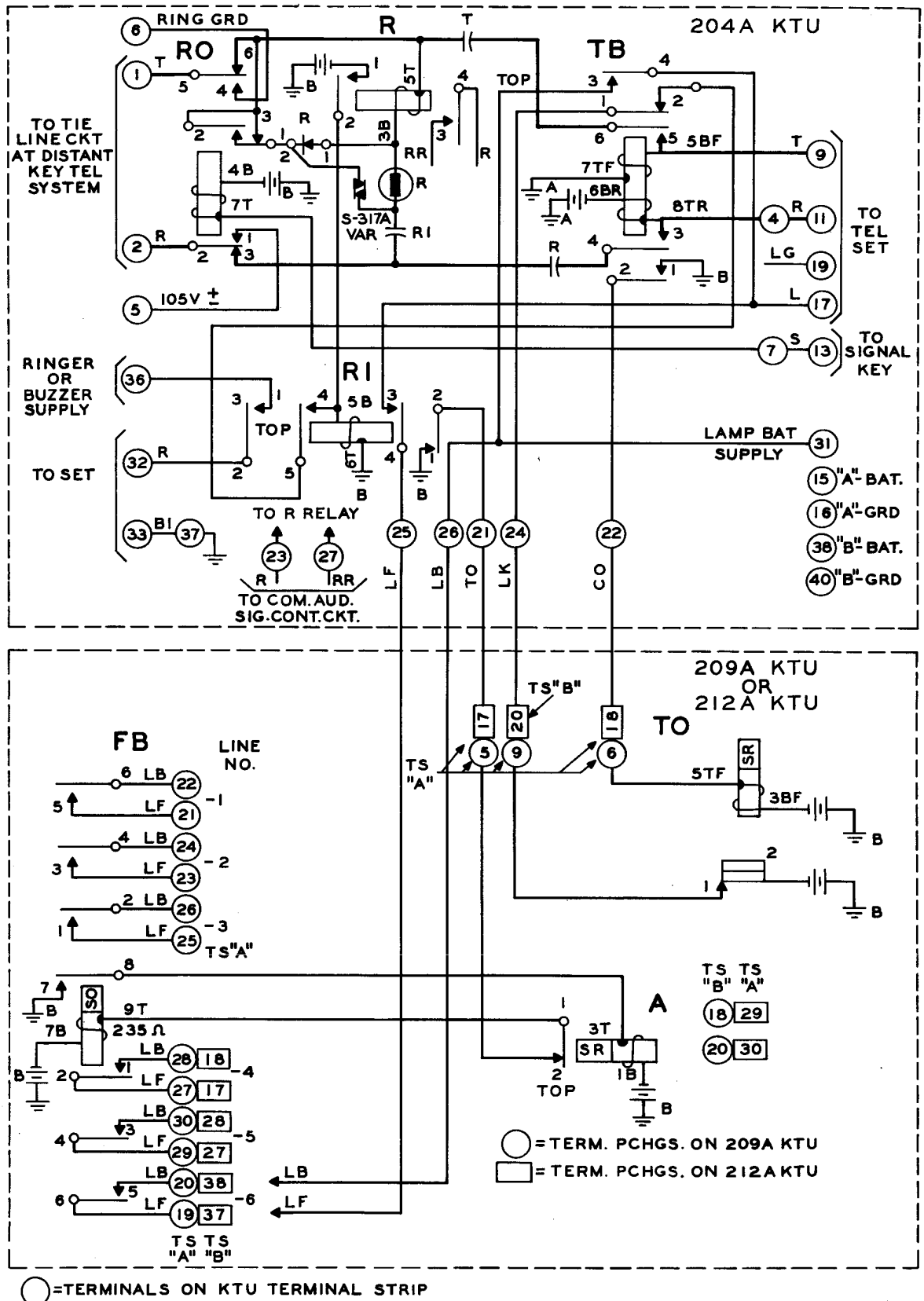


FIG. 2 - RINGDOWN-TIE LINE CIRCUIT - 204A AND 209A OR 212A KEY TELEPHONE UNITS

STATION LINE CIRCUIT (FIG. 3)

3.11 Incoming Call - When a call is originated at the distant station, the (L) relay is operated by the set current and in turn operates the (L1) relay. The (L1) relay operates the audible signal steady, connects the signal lamps to the flashing circuit, and starts the flashing circuit functioning.

3.12 Answer an Incoming Call - An incoming call is answered by operating the pickup key associated with the line and removing the handset from the mounting. Current through the telephone set operates the (TB) relay which releases the (L1) relay, operates the (CO) relay, and operates the (TO) relay of 209A or 212A key telephone unit. The release of the (L1) relay silences the audible signals and stops the lamp flashing circuit functioning. Operation of the (CO) relay lights the signal lamps steady and locks itself operated under control of the (L) relay in parallel with contacts of the (TB) relay.

3.13 Outgoing Call - An outgoing call is originated by operating the pickup key associated with the line, removing the

handset from the mounting, and operating the signaling key. Current through the telephone set operates the (TB) relay which operates the (TO) relay of 209A or 212A key telephone unit and operates the (CO) relay which in turn lights the signal lamps steady. Operation of the signaling key operates the (RO) relay which connects ringing current to the line to signal the distant station. When the distant station is answered, the set current operates the (L) relay which locks the (CO) relay operated.

3.14 Holding - The holding feature is not provided with this circuit, although if the local station disconnects and the distant station does not, the signal lamps will remain lighted steady and no incoming signals will be operated due to the parallel holding paths which keep the (CO) relay operated.

3.15 Disconnection - When the distant station is disconnected, the (L) relay releases. When the local station is disconnected, the (TB) relay is released, releasing the (TO) relay of 202A or 212A key telephone unit. The last station disconnected releases the (CO) relay which extinguishes the signal lamp restoring the circuit to normal.

